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High performance ethanol and acetone gas sensing behavior of $FeCo_2O_4$/graphene hybrid sensors prepared by facile hydrothermal route

S. Rathinavel [a], G. Balaji [a], S. Vadivel [b,*]

[a] Department of Electrical and Electronics Engineering, Paavai Engineering College (Autonomous), Namakkal, 637 018, Tamilnadu, India
[b] Department of Physics, Paavai Engineering College (Autonomous), Namakkal, 637 018, Tamilnadu, India

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ABSTRACT

Historically, production of high-performance gas sensing materials has promised to satisfy the worldwide research interests with the increasingly enhanced gas sensor devices. In this paper we are adopting a facile hydrothermal strategy to prepare the ternary $FeCo_2O_4$/graphene hybrid nanocomposites. The spinal phase of $FeCo_2O_4$ with spherical shaped morphology was obtained through XRD, SEM and TEM images which confirms. In addition, an average particle size within the range of 30−40 nm was observed for the individual spherical shaped morphology. The Raman and XPS studies also explore the vibration modes and chemical composition of the $FeCo_2O_4$/graphene composites. The BET surface area and BJH pore size of $FeCo_2O_4$/graphene composites is estimated to be 93.2 m^2/g and 19.45 nm, respectively. Such high surface area will provide the active path to gas molecules which will increase the efficiency of gas sensing. Measurement of ethanol and acetone gas sensing using clad altered fiber optic sensors and sensitivities for ethanol and acetone gases are 22 and 43 counts/ppm, respectively. Also discussed is the proposed gas sensing mechanism.

1. Introduction

Gas sensors are important components of sophisticated area systems, focusing on their wide range of applications such as in the therapeutic field, indoor and outdoor discussions on quality measurement structures, popular research, the automotive industry, and the military [1–3]. Chemical sensors based on fiber optics are currently becoming extremely clever because they are quick, tiny and low cost operation. Gas detection and monitoring can be done in inaccessible and impredictable environments [1–3]. The propagation of transmitted light in optical fiber was extremely sensitive to optical properties (refractive index, absorption, etc.) of a cladding technique, and the fiber optic gas sensor [4–8] used extensively. In this, a small part of an inert cladding is removed and replaces it with a gas sensing material which changes its optical properties by interacting with the gas. Due to their superior gas sensitivity, metal oxide-based gas sensors have been commonly used in recent years for the detection of various toxic gases. These sensors illustrate an excellent response to oxidizing and reducing gases during surface reactions. Metal oxides are a basic route of useful materials for chemical and bio identification among their diverse applications. Following the disclosure of the identifying properties of these materials, a substantial grouping of metal oxides and their doped varieties has been widely investigated for highly sensitive

* Corresponding author.
E-mail address: vadivel.physics@gmail.com (S. Vadivel).

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Design and fabrication of clad modified fiber optic gas sensor based CeO_2/MWCNTs hybrid sensors by facile hydrothermal technique

S. Vijayakumar[a], S. Vadivel[b,*], A. Biruntha[a], T. Brindhasri[a], P.A. Desika[a]

[a] Department of Electronics and Communication Engineering, Paavai Engineering College (Autonomous), Namakkal 637 018, Tamilnadu, India
[b] Department of Physics, Paavai Engineering College (Autonomous), Namakkal 637 018, Tamilnadu, India

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ABSTRACT

In this report, a novel CeO_2/MWCNTs nanocomposite was synthesized using a simple hydrothermal method and examined structural, morphological and elemental composition using powder X-ray diffraction, transmission of electron microscopy, dispersive energy spectra, and N_2 adsorption-desorption analysis. The XRD and TEM findings indicate that both pure nanocomposite and CeO_2/MWCNTs exhibit cubic structure and CeO_2 nanoparticles (30–60 nm in diameter) are distributed uniformly on the surface of MWCNTs. The gas sensing properties of the as synthesized composites were tested using fiber optic clad modified method at room temperature with ethanol and ammonia gases. The results showed that nanocomposite CeO_2/MWCNTs demonstrated high sensitivity (75×10^{-3} k/Pa), rapid response (26 s) and recovery time (35 s). The newly prepared sensor CeO_2/MWCNTs opens up exciting perspectives for nanosized sensor devices to develop. The possible mechanism for gas sensing has also been discussed in detail.

1. Introduction

Fast and accurate detection of trace amounts of hazardous gases is important in many aspects of human society, such as environmental monitoring and detection of toxic gases in industrial processes, public health, and national security. Chemical sensors based on fiber optics are currently becoming extremely clever because they are quick, tiny and low cost operation. Gas detection and monitoring can be done in inaccessible and impredictable environments [1–3]. The propagation of transmitted light in optical fiber was extremely sensitive to optical properties (refractive index, absorption, etc.) of a cladding technique, and the fiber optic gas sensor [4–8] used extensively. In this, a small part of an inert cladding is removed and replaces it with a gas sensing material which changes its optical properties by interacting with the gas. Due to their superior gas sensitivity [9–12], metal oxide-based gas sensors have been commonly used in recent years for the detection of various toxic gasses. These sensors illustrate an excellent response to oxidizing and reducing gasses during surface reactions [13]. Recently, many metal oxides such as SnO_2 [14], WO_3 [15], ZnO [16] and Sm_2O_3 [17] have been extensively studied as sensing material to detection of different gases. Of these, CeO_2 is a widely applied rare-earth oxide material in many fields such as catalysts, optics, and gas sensors because of its unique properties, arising peculiarly from its 4f shells. Cerium being the most abundant nontoxic element in the Earth's crust, CeO_2 is one of the most used catalysts for the reduction of toxic gases, like CO, NOx, hydrocarbons, etc., emit from automobile exhausts. High oxygen storage capacity, huge oxygen vacancies, and low redox potential between Ce^{3+} and Ce^{4+} have made this oxide an advantageous sensing material toward reducing gases. During the past decade, CeO_2 has gradually become a promising metal oxide for gas sensing applications and has gained an upsurge in interest in the field of gas sensors owing to its properties like large number of oxygen vacancies and high oxygen storage capacity. CeO_2 has already proved its ability in detecting various toxic gases like, formaldehyde, ethanol, carbon monoxide, and ammonia [18–22]. Ceria was also used for detecting acetone gases and NO in an oxygen atmosphere, and the results showed that CeO_2 senor is more acetone-sensitive than NO [23]. The ZnO and SnO_2 doped CeO_2 sensor demonstrated superior efficiency in sensing gas against CO, butanone and ethanol gases [24–26]. However, the CeO_2 sensors have poor electron conductivity and low surface area which decreased the sensing properties of different gases. CNTs are used in gas sensing applications because of their inherent high electrical conductivity and chemical stability to solve those problems. CNTs are simpler to get well-aligned arrays compared to graphene, which is considerable for as-prepare gas sensor reproducibility. Furthermore, the CNT-based gas sensing output operates at low working temperatures as opposed to metal oxide nanoparticles, resulting in excellent sensitivity and selectivity. Due to their synergistic effect, excellent sensing

* Corresponding author.
E-mail address: vadivel.physics@gmail.com (S. Vadivel).

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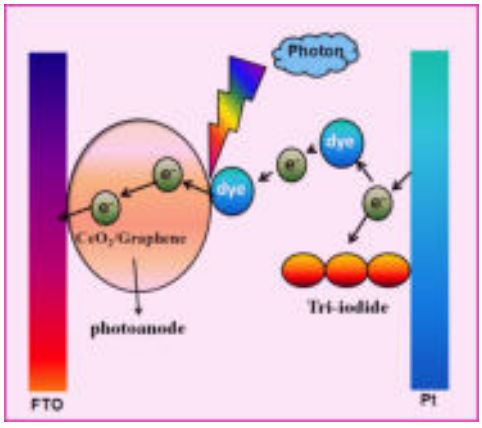
Short communication

A simple and one step low cost microwave induced low cost grapheme modified CeO_2 photo electrodes for high-efficiency dye-sensitized solar cells

R. Gayathri[a,*], G. Raja[a], P. Rajeswaran[b]

[a] Department of Chemistry, Paavai Engineering College, Namakkal 637018, Tamilnadu, India
[b] Department of Chemistry, Vivekanandha College of Arts and Sciences for Women, Tiruchengode 637205, Tamilnadu, India

GRAPHICAL ABSTRACT



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Keywords:
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ABSTRACT

The photovoltaic properties of CeO_2 nanoparticles were improved when composited with graphene making this material as a potential candidate for high performance dye sensitized solar cells (DSSCs) device applications. Pure CeO_2 with various composite of CeO_2 and graphene photoanodes were successfully fabricated via microwave irradiation method. The fabricated photoanodes were characterized with various techniques XRD, SEM, Raman, XPS, UV-DRS, PL and BET analysis. Cubic structure with uniform with individual spherical shaped particles (30–35 nm) was consistently wrapped on the graphene nanosheets. Mesoporous nature with high surface area (83.5 m^2/g) and pore size (29.3 nm) was gotten by the optimized (3:1) CeO_2 incorporated graphene composite photoanode. A considerable red shift in optical band gap energy and the significant reduce in the recombination of electron-hole pair process was identified through UV and PL analysis. FTO substrate has been used to making the photoanode (CeO_2/graphene) and counter electrode (platinum), which are finally constructed by sandwich type dye sensitized solar cell device. The J-V plot reveals that CeO_2/graphene hybrid photoanode deliver a high power conversion efficiency of 7.95%, which is comparatively higher than bare CeO_2 photoanode (4.48%). The improved PCE by graphene doping is also discussed in detail.

* Corresponding author.
E-mail address: gayathri8407@gmail.com (R. Gayathri).

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Experimental Investigation of Passive Heat Transfer Enhancement Using in Plain Tape Insert

*A.P.Sivasubramaniam[1], K.Mayilsamy[2] and P.Murugesan[3]
[1]*Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India*
[2]*Department of Mechanical Engineering, PSG College of Technology, Coimbatore, Tamil Nadu, India*
[3]*Department of Mechanical Engineering, K.S.R Institute for Engineering and Technology, Namakkal, Tamil Nadu, India*
Email: [1]visuga@rediffmail.com, [2]k_mayilsamy@yahoo.com, [3]pmksrct@gmail.com

Abstract

In present days, almost all the industries that use heat exchangers use them at present with inserts required to improve the convective heat transfer rate of the system without the overall performance getting affected. Even the inserts can be conveniently set up and require less maintenance aside from the cost benefits.Given the successful role of inserts in the usage of exchangers, the present study experimentally examines the contribution of plain tape inserts that are mounted within the plain tube of a dual pipe heat exchanger (DPHE) to increase the system's heat transfer capacity.Using a simple tube under counterflow structure for variable pressure drops in hot water, an experimental system is used to conduct the test process and measurement is performed for various mass flow speeds of hot and cold water inlet temperatures at 53^0C and 30^oC respectively.From the experimental measurements the thermal enhancement factor and even the properties of heat flow and friction effect are learned from the results of the experiments.The experiments are repeated with the proposed insert profiles to compare the results with that of the plain tube. It is observed from the tests that the plain tape insert gave the highest thermal enhancement level.

Keywords: *Heat transfer enhancement, friction factor, plain tube & plain tape.*

1. Introduction

The double pipe heat exchanger may be a way of simplifying the interchange of two fluids with heat b / w by not reacting at various temperatures.Two forms of heat transfer occurs in heat exchanger such as convection & conduction. Typically convection happens in each operating fluids & conduction through walls of heat exchanger that separates the fluids. The potential to increase the coefficient of heat transfer along with reduced reduction of the friction factor determines the inserts.For various industrial areas, tube extensions are used for developments in the heat transfer of fossil fuel and for chemical plants in just a few years.The second law increases effectiveness and entropy production by raising the driving force of properties as compared by the rise in the coefficient of heat transfer.The research provides an evaluation of friction factor & heat transfer coefficient for various inserts of different thicknesses and materials (Aluminum & Copper) discussed by **AjitShinde et al., [1] [2]**.

*A.P.Sivasubramaniam1

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Simulation Studies of Heat Transfer Enhancement in a Double Pipe Heat Exchanger Fitted with Plain Tape Insert

A.P.Sivasubramaniam[1]*, K.Mayilsamy[2] and P.Murugesan[3]

[1]*Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India*

[2]*Department of Mechanical Engineering, PSG College of Technology, Coimbatore, Tamil Nadu, India*

[3]*Department of Mechanical Engineering, K.S.R Institute for Engineering and Technology, Namakkal, Tamil Nadu, India*

Corresponding Author
E-mail Id:-visuga@rediffmail.com

ABSTRACT

Heat exchangers are important devices that are commonly used in various industries such as processes, petroleum refining, chemicals, oil industries, power plants, and paper, etc. The demand for high efficiency heat exchangers has been driven by energy and material saving requirements as well as environmental challenges in the industry. In order to improve the heat exchanger performance, an increase in the heat transfer in heat exchangers is required.In addition, heat transfer improvement makes it possible to greatly reduce the size of the heat exchanger. For a compact heat exchanger, a high heat transfer rate with minimum space requirement is required. The counter flow heat exchanger increases the heat transfer feature of the plain tube with plain tape insert in the inner tube. To predict the Nusselt number, Reynolds number & Thermal enhancement factor based on the numerical calculation with help of ANSYS software.

Keywords:-*Nusselt number, friction factor, thermal enhancement factor, reynolds number and plain tape.*

INTRODUCTION

The heat transfer enhancement capability beside a reduced the loss in friction factor defines the tapes. In various industrial areas such as fossil fuel refineries and chemicals plants for several years the tube inserts are used for improving heat transfer. For a heat exchanger there can be some different flow patterns. General types of heat exchangers are counter flow, parallel flow, & cross flow. The most effective flow method of the three is a counter flow heat exchanger. A counter flow heat exchanger is the warm fluid that enters at one end of the heat exchanger and the cold fluid that exits at the same end of the flow path. Counter flow is the most popular type of fluid to fluid heat exchanger; since it is the most effective type. Sudha Brahma Naidu & Kishore [1]the heat transfer studied is essentially a slow process and is strengthened by passive or active improvement methods.

The heat transfer and pressure drop performance with twist ratios 4 and 5 shows better results, despite the comparable pumping energy consumption of tubes with or with-out a twisted tape. Suvanjan Bhattacharyya et al., [2] A non-uniform three-dimensional grid was developed to examine the heat transfer performance critically. Studies show that as contrasted with simple twisted tape

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Mathematical modeling and investigation on aluminium bronze MMC using ECM process

A. Jayapradha [a,*], G. Jims John Wessley [b], G. Vimalarani [c], P. Ramesh Kumar [d], Ram Subbiah [e], S. Maniraj [f]

[a] Department of Mathematics (S&H), Sri Krishna College of Engineering and Technology, Coimbatore 641 008, Tamil Nadu, India
[b] Department of Aerospace Engineering, Karunya Institute of Technology and Sciences, Coimbatore 641 114, Tamil Nadu, India
[c] Department of Electronics and Communication Engineering, Hindustan Institute of Technology and Science, Chennai 603 103, India
[d] Department of Agriculture, Karunya Institute of Technology and Sciences, Coimbatore 641 114, Tamil Nadu, India
[e] Department of Mechanical Engineering, Gokaraju Rangaraju Institute of Engineering & Technology, Hyderabad 500 090, Telangana, India
[f] Department of Mechanical Engineering, Paavai Engineering College, Namakkal 637 018, Tamil Nadu, India

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ABSTRACT

The electrochemical based energy processes are used to remove material for intricate contours or cavities. The main features of the electrochemical processes are no mechanical and thermal stresses are produced during operations. The Electro-Chemical Machining (ECM) was used to produce the machining parts with high quality of surface finish. This chapter was used to discuss the machinability behaviours of aluminium bronze through ECM which was produced from stir casting method. The Surface Roughness (SR) was measured with the help of input factors such as voltage, electrolyte flow rate and its pressure. To achieve optimal surface roughness, the effective optimization tool like as taguchi technique was applied. Analysis of variance was applied to determine the most involvement factor on SR based on the highest F value and percentage of role of factors. The electrical voltage has provided the considerable effect on surface roughness.
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1. Introduction

The electro chemical machining was used to machine hard materials such as titanium, inconel, cobalt and carbides. It was used to manufacture the complex shapes such as profiles, contours and turbine blades with better surface finish. It was also extensively used in deburring process. Absolute zero tool wear and no heat generation were the special features of ECM process. It was suitable for mass production. High material removal can be achieved with no thermal stresses were affect the machined surface. It comes under reverse electro plating process. Single operation was enough to make the materials with good quality surface. The surface roughness of the material depends on the composition of alloying elements and ECM process factors. The reinforcement, machining characteristics and processing of Al-MMC were discussed [1]. The surface roughness was measured in SiC reinforced aluminium composite [2–4]. The machining parameters levels and its effects were studied in Al/SiC-MMC [5–6]. The full factorial design of experiments was conducted on electrochemical machining of stainless steel [7]. The optimization and electrolyte characteristics were studied during ECM o turbine blades [8]. The ECM of titanium and taguchi-grey relational analysis was discussed [9–10]. The ECM drilled holes and radial over cut were investigated [11]. The ECM applications and its features were compared with EDM process [12]. Electrochemical discharge machining was conducted on fiberglass reinforced plastics [13]. Micro electrochemical machining of inconel factors were optimized through taguchi method [14]. The electrolyte flow rate was the powerful factor and it was found through ECM of titanium [15]. The machinability surface was compared before and after process of ECM on Al-MMC [16].

The present investigation deals with machinability behaviors of aluminium bronze MMC using ECM process. After machining of aluminium bronze MMC, the surface roughness was measured. The process factors were studied through taguchi and variance analysis.

* Corresponding author.
E-mail address: jayapradha@skcet.ac.in (A. Jayapradha).

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Hardness performance analysis of chromel composite using end and lateral quenching method

Santhanakrishnan Raman [a,*], J. Vairamuthu [b], B. Stalin [c], Ram Subbiah [d], S. Maniraj [e]

[a] Department of Aerospace Engineering, Amity University – Maharashtra, Mumbai-Pune Expressway, Bhatan 410 206, Panvel, Navi Mumbai, India
[b] Department of Mechanical Engineering, Sethu Institute of Technology, Pulloor, Kariapatti 626 115, Tamil Nadu, India
[c] Department of Mechanical Engineering, Anna University, Regional Campus Madurai, Madurai 625 019, Tamil Nadu, India
[d] Department of Mechanical Engineering, Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, Telangana, India
[e] Department of Mechanical Engineering, Paavai Engineering College, Namakkal 637 018, Tamil Nadu, India

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ABSTRACT

The achievement of materials hardness was difficult in heat treatment through quenching methods. At the same time, the quenching medium was not covered the entire surface of the work piece. In present topic was discussed about the development of water quenching method for chromel composite. For these experimental investigations, the different levels of control factors were considered such as water velocity, the rotational speed of the work piece, and Standoff Distance (SOD). The response such as hardness was evaluated according to the variation of control or input factors. The effects of quenching factors were reported through the Taguchi technique and variance analysis. The maximum hardness of 545BHN was achieved through the developed quenching apparatus. The water velocity (74.22%) was the influential factor on hardness. It was validated through variance analysis.
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1. Introduction

The applications of hardened materials have been increased gradually in all fields especially construction and manufacturing sectors. The effect of quenching and improved substance properties were analyzed [1]. The particulates of composites were strengthened through the quenching method [2]. The cooling rate and its effects have been discussed in aluminium composite [3]. The material structure depended on its temperature which was provided during the casting process [4]. The stir casted material was quenched by the developed model [5]. The Taguchi optimization was performed based on L_9 orthogonal array and its effect of factor has been confirmed through variance test [6–25]. The sintered aluminium composites were kept under solution treatment with different temperature and its microstructure was studied [26]. Al 6063 was treated under age-hardened and its effects of silicon carbide particles have been discussed [27]. The Jominy end quench method was executed on aluminum alloys and its Vickers hardness was determined [28]. In Jominy end quench process, the cooling rate was directly proportional to the distance from the quenching end [29]. Micro structural and characteristics of Al-Zn-Mg-Cu alloy were investigated under different aging circumstances [30]. The rapid cooling and its effects have been analyzed in aluminium and silicon alloys [31].

The present investigation deals with the modified water quenching apparatus for the heat treatment of the material. For experimental purposes, chromel composite was considered and its hardness was measured after the end and lateral quenching process.

2. Experimental method

The experimental arrangement with the developed model was shown in Fig. 1. The chromel composite was converted to the required shape and a size of 25 mm diameter and 100 mm length. The heat-treated work piece was held rigidly on the chuck and it was rotated. The water quenching was applied at the end and lateral surface of the work piece. Therefore, uniform cooling was provided on all surfaces of the work piece. The control valves were used to regulate the flow of water. After the quenching process, the water was returned to the collecting tank. Hence, it was one

* Corresponding author.
E-mail addresses: drsanskrish@gmail.com, sraman@mum.amity.edu (S. Raman).

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Abrasive water jet experimentation on zirconium boride and boron carbide reinforced molybdenum metal matrix

R. Arravind [a,*], V. Sankar [b], S. Marichamy [c], B. Stalin [d]

[a] Department of Aeronautical Engineering, Paavai Engineering College, Namakkal 637018, India
[b] Department of Aeronautical Engineering, Nehru Institute of Engineering and Technology, Coimbatore 641105, India
[c] Department of Mechanical Engineering, Sri Indu College of Engineering & Technology, Hyderabad, India
[d] Department of Mechanical Engineering, Anna University, Regional Campus Madurai, Madurai 625 019, India

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ABSTRACT

In metal industries, molybdenum has placed an important role because of its properties and applications. It has high strength, hardness, electrical conductivity, resistance to wear and corrosion. This paper deals with parametric effects of abrasive water jet machining of Molybdenum Metal Matrix (Mo-MMC) which is made from stir casting technique. The two reinforcements such as Boron Carbide (B_4C) and Zirconium Carbide (ZrC) are considered with a mixture of compositions such as 2, 4 and 6% weight proportions. Further development of work and performance of metal properties, the prepared samples are involved for testing of materials. Based on these compositions, 6% of an alloy is provided the best performance. Hence, it has forwarded to the further investigations like as Abrasive Water Jet Machining (AWJM) process. The machinability characteristics are studied through this mechanical energy based method. The response of Material Deletion Rate (MDR) is measured through the change of input constraints such as water peessure, abrasive flow rate and traverse speed. The optimal parameters are derived from Taguchi method. The parametric effects on material deletion rate are investigated with the help of Pareto charts and Arialysis of variance (ANOVA).
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1. Introduction

The molybdenum alloy is used in engines, cutting tools, heating elements, blades and electrodes. Abrasive water jet machining process was providing better dimensional accuracy and surface texture. Finally, water pressure was the major role on material deletion rate during water jet machining of duplex brass [1]. The ceramic particulate based aluminium metal matrix was fabricated through stir casting method [2–4] and then machined by abrasive water jet machining process [5]. An AWJM parametric investigation was carried out on mixture of composite which was formed with the help of multi stage stir casting route [6]. The justification of the experimental result was verified by analysis of variance [7–11]. The material deletion rate depended on water pressure and traverse speed [12–13]. Several research primarily focused on B_4C particulate reinforcement with MMC were achieved the desired properties [14–17]. The Taguchi parametric optimization was used to found the optimal constraints in abrasive water jet machining of aluminium [18] and mild steel [19]. The metal properties of the brass metal matrix were improved through various compositions of reinforcements [20]. The zirconium silicate used as reinforcement in aluminium metal matrix [21]. AWJM was used to cut various materials such as epoxy composite, graphite and glass [22].

In present work is used to explain the abrasive water jet experimentation on zirconium boride and boron carbide reinforced synthesized molybdenum metal matrix. The optimal parameters were found from Taguchi method. The parametric effects were studied through analysis of variance and Pareto charts.

2. Material and method

2.1. Material synthesis using stir casting process

The boron and zirconium carbide based molybdenum metal matrix was produced with the aid of the Stir casting process. The

* Corresponding author.
E-mail address: arravind.r@gmail.com (R. Arravind).

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Automatic Greenhouse Roofing System by Using IoT

Ajithkumar V[1], Arun S[2], Deepan kumar R[3], Mohan babu G[4], Mr. Satheswaran N[5]
[1, 2, 3, 4] Dept of Agriculture Engineering
[5]Assistant Professor, Dept of Agriculture Engineering
[1, 2, 3, 4, 5] Paavai Engineering College, Namakkal, India

Abstract- *Presently a days, throughout the mid year seasons the developed harvests gets influenced because of the overwhelming daylight force and temperature. The principle topic of this task is that to keep the yields from the overwhelming daylight, temperature and spare harvests . The Temperature sensor is utilized for the working of programmed roof top and Humidity sensor is utilized to keep up and make great condition control on nursery by utilizing ventilation fan and water sprayer in 180o and afterward ultrasonic sensor is utilized to consequently control the entryway framework.*

Keywords- Temperature sensor, Humidity sensor, Ultrasonic sensor and Automatic roof.

I. INTRODUCTION

The framework depends on Arduino microcontroller, programmed work, Ultrasonic sensor, Temperature sensor and Humidity sensor. This framework utilizes battery-powered force putting away sources as 12V battery that is energized from AC current. At that point AC current is put away in 12V DC battery. During summer season, part of harvests are high influenced by substantial daylight, temperature and warmth. Primary goal of our venture is to keep crops from high daylight force, temperature and warmth during summer season and make positive condition are keep up consequently.

Temperature sensor is utilized to gauge daylight power, warmth and temperature esteem from external site of nursery. When to arrived at high warmth and temperature esteem, this framework is consequently shut rooftop in nursery for lessening effect of high daylight force. Dampness sensor is utilized to gauge temperature estimation of within nursery during high daylight force season like April and May and ventilation fan and water sprayer is utilized to evacuate heat and to keep up ideal condition in nursery.

Ultrasonic sensor is put front of the nursery rooftop. It is utilized to distinguish any specialist or human will enter the nursery and consequently open and close the entryway framework. Fundamental point of our task is make full and full programmed nursery framework for decreasing human work adequacy, working time and any wastage of vitality or force.

II. OBJECTIVE

The fundamental goal is to build up the cost effective computerized framework, which requires less upkeep work. The nursery i.e., Automatically identify temperature and moistness condition in nursery and consequently control rooftop framework, ventilation fan, water sprayer and afterward entryway framework.

- To keep harvests and plants from the high daylight force, warmth and temperature.
- To make ideal condition for plants development.
- To control daylight force, warmth and temperature Inside the nursery.
- Full and full computerization frame work keep up in nursery.

III. SYSTEM ARCHITURE

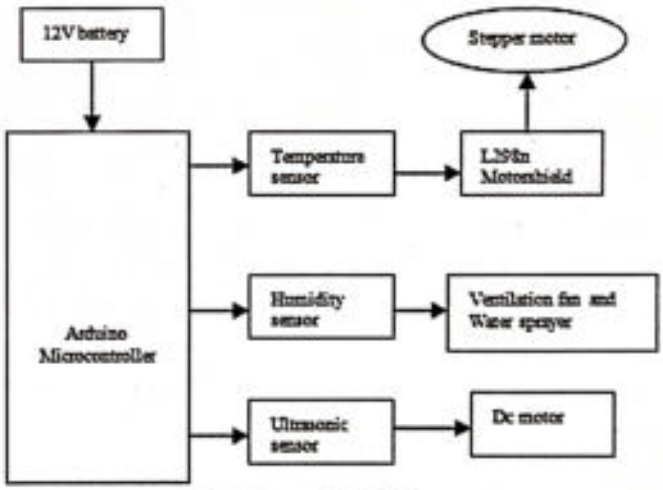

Fig. 1 System block diagram

IV. HARDWARE AND SOFTWARE USED

Hardware used:

1. Arduino UNO
2. Temperature sensor
3. Humidity sensor
4. Ultrasonic sensor
5. L298N motor drive
6. Stepper motor

Design and Fabrication of Sugarcane Chipping Cum Planting Machine

Atif Hasan[1], Harish B[2], Naveen Raj R[3], Neelash S[4], Prof. Balamurugan V[5]
[1, 2, 3, 4] Dept of Agriculture Engineering
[5]Associate Professor, Dept of Agriculture Engineering
[1, 2, 3, 4, 5] Paavai Engineering College, Namakkal. -637018 (T.N)

Abstract- *Sugarcane planting is a very labour intensive job and it involves considerable human drudgery. Cost of sugarcane planting by mechanized method is less compared to traditional method. It also reduces drudgery involved in unit operations of sugarcane planting. The reduction in cane yield owing to delayed planting cannot be compensated by additional inputs viz., frequent irrigations, extra fertilizers and intercultural operations. In order to achieve uniform crop stand, correct seed rate, appropriate depth of setts placement and uniformity of setts with required overlapping are important. These, however can better be achieved by using tractor drawn sugarcane cutter planter apart from economizing labour and energy. Thus, recently developed sugarcane cutter planters are getting very good acceptance among sugarcane cultivators. Generally planting of any crop is very much important as far as the crop growth and yield is concerned. This paper describes the design refinement of sugarcane chipper cum planter and its prototype development. This machine simultaneously chips and plants the sugarcane setts into the furrows by pushing it from behind.*

Keywords- Human drudgery, Intercultural operations, Prototype, Sugarcane setts, Cultivators.

I. INTRODUCTION

Sugarcane an important agro industrial crop in India plays a vital role in national economy by contributing 1.9% to GDP. The crop is cultivated in 4.22 million hectare producing 300 tonnes with productivity of 75-80 tonnes per hectare. However, there have been fluctuations in area as well as productivity over the years on a count of several factors. Cutting is the most common method of reproduction in sugarcane. Each cutting must contain at least one bud, and the cuttings are usually planted by hand, the various method of sugarcane planting like flat, trench, pit, staggered row and space transplanting. Hand harvesting accounts for more than half of the world's production, and is especially dominant in the developing world. Sugarcane planting requires about 350 men per hour and 30 to 40 pair of bullocks per hour, per hectare. Mechanization of sugarcane harvesting is an essential input to the modern agriculture as it enhances better productivity, besides using human drudgery and cost of cultivation. Cost of sugarcane cultivation by mechanized process is almost one third of complete manual process. These days sugarcane cultivating farmers are greatly affected by the high production cost of sugarcane cultivation. The high cost involved in the cultivation is generally associated with high labour cost. In addition the yield of the sugarcane is also mainly affected due to the delaying timely planting of sugarcane setts and the error that is caused by planting the setts become a major concern to eradicate these problems which inspired us to innovate a machine which brings solution to all these problems.

II. LITERATURE REVIEW

The concept of the project work is to design and fabricate a machine which performs both chipping cum planting operations simultaneously. For this we referred various research papers regarding the planting techniques and the mechanization which was already developed. By reviewing these papers we came to know that these mechanization majorly depends on non renewable resources for its operation and also involves considerable amount of labours and human drudgery, and we also found that there is no integrated machine for both chipping cum planting operations for sugarcane planting and the both operations are done separately by different machines. So we decided to innovate a machine which integrates both chipping cum planting operations in a single unit. This machine greatly satisfies the demand of the sugarcane cultivators and it also considerably reduces the cost of cultivation and human drudgery involved.

III. DESIGN OF MACHINE

The important factor in manufacturing this machine is to determine the dimension of the linkages and angle between them. The dimension of this machine is preplanned during the designing process by considering the spacing at which the sugarcane setts needs to be planted.

1. Design Calculation

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Experimental Study on Behaviour of Concrete Filled Tubular Column with GFRP Wrapping

Ms.R.Saranya[1], Mrs.J.Umanambi[2]
[1]PG Scholar, Department of Civil Engineering, Paavai Engineering College, Namakkal
[2]Head of the Department, Department of Civil Engineering, Paavai Engineering College, Namakkal

Abstract- **Nowadays the usage of concrete filled steel tubular column constructions is becoming popular due to their high strength, stiffness, durability, corrosion resistance performances and aesthetic appearances. By using the cement and fine aggregates, leads to the environmental pollutions. Therefore, in this study the replacement concrete involved. In this experimental study, the tubular columns were filled with control and replacement concrete mixtures. The M25 grade of concrete was involved for this experimental work. This investigation focused on the replacement of cement with 5 % of metakaolin and fine aggregate with 25% of green sand. The type of concrete used and number of layers of glass fibre reinforced polymer wrapped around the outer core are the main parameters considered in this study. Experimentally, the ultimate load carrying capacity for the GFRP wrapped and unwrapped concrete filled columns were found. From the results, it is observed that the GFRP wrapped concrete filled tubular column specimens performed well under the compressive load and their performances was better than the unwrapped concrete filled tubular columns. Also, it was observed that the load carrying capacities of tubular columns were increased with the increase in the GFRP layer around the outer core of the concrete filled tubular columns**

Index terms- circular Stainless steel, Green sand, Glass Fibre, Vinyl Estar Resin

INTRODUCTION

In the past several decades, the concrete filled steel tubular columns have been used in a wide variety of structural engineering applications, particularly in bridges and high rise buildings. This increase in use is largely due to the structural and economic advantages offered by concrete filled tubes over open and empty sections, as well as their aesthetic appeal. Also, circular hollow sections possess many advantages over open sections, including aesthetic appearance and economy in terms of material costs. Stainless steel provides high corrosion resistance, aesthetic appearance, ease of maintenance, ease of construction and high fire resistance compared to traditional carbon steel. Due to the complexity of connections between steel beams and circular hollow sections, their use in structural steelwork is limited. This is because the use of standard bolting is not feasible and costly unpopular welded connections are the normal solution.

REVIEW OF LITERATURES

Serkan Tokgoz (2015), showed the experimental behaviour of plain and steel fibre concrete filled stainless steel tubular columns under biaxial bending and axial compression. The parameters such as concrete compressive strength, cross section capacities, load eccentricity, steel fibre material and slenderness was studied, and the ultimate strength capacities, load deflection relations and load axial strain behaviour were investigated. Concluded that the high strength stainless steel tube was very effective on behalf of concrete filled steel tubular column behaviour.

Richard Liew J Y et al (2014), investigated the behaviour of tubular columns in filled with ultrahigh strength concrete at ambient and elevated temperatures. The test were conducted for the basic mechanical properties of the high strength materials and structural behaviour of stub columns under concentric compression, beams under moment and slender beam columns under concentric and eccentric compression. High tensile steel with yield strength up to 780 MPa and ultrahigh strength concrete with compressive cylinder strength up to 180 MPa were used to construct the test specimens. The test values were compared with the predictions using a modified

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Design and Experimental Study on Steel Truss Bridge using Splice Connections

V Ravi sankar[1] and J Umanambi[2]

[1]PG Student Paavai Engineering college Namakkal

[2]Assistant professor Paavai Engineering college Namakkal

Abstract:

Structural steel has many advantages over other construction materials by its high strength and ductility. It has a higher strength to cost ratio in tension and a slightly lower strength to cost ratio in compression when compared with concrete. Thus, structural steel is an efficient and economic material in bridges. This paper is intended to design and evaluate the steel truss bridge experimentally by using splices. A typical Warren truss bridge is designed for the single lane railway traffic with the total length of 49 m. In which the truss members designed are further reduced by connecting with splices. This makes the truss structure more efficient and able to withstand seismic forces by reducing the base shear up to 27%. The increase in load carrying capacity is also examined experimentally with minimum deflection using splice connections.

key words : steel connection, splice connection , railway bridges, steel joint seismic

I Introduction

The bridges are the structures, which provide means of communication (viz., passage) over a gap. The rivers, canyons and valleys form natural gaps. The railway and highway crossings, highway and canal crossings form artificial gaps. These are constructed to carry highway traffic are known as highway bridges (road bridges). The bridges built to carry railway traffic are known as railway bridges (rail bridges). The bridges used pedestrians are drown as foot bridges. Some bridges which carry cannals and pipe lines and these bridges are known as aqueduct bridges. These are constructed over busy localities to carry the vehicular traffic over the area keeping the continuity of activities are called as via ducts. Though the recent version of the code, IS 800:2007, contains provisions for design and detailing for seismic loads, it does not suggest the type of connections which are suitable for high or intermediate seismic zones. **Shubhank Gupta et al., (2017)** This paper presents the analysis and design of steel truss railway bridge of span 50 m. The bridge with same railway loadings of 32.5 tonne has been assigned in

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EXPERIMENTAL STUDY ON MESH CONFINED CONCRETE SUBJECTED TO HIGH TEMPERATURE

J. Hariprasad[1], J. Umanambi[2]

[1]*Pursuing Post Graduation in Structural Engineering,*
[2]*Head of the Department in Paavai Engineering College, Department of Civil Engineering, Namakkal*

Abstract:- Concrete is a widely used construction material in buildings and several structures for a quite long time. Concrete can be defined as a composite binding material having constituents as aggregate, finer sand and fine cement and water in predefined proportion so as to achieve required strength .Concrete is a composite having properties that change with time. Durability of concrete depends on many factors including its physical and chemical properties, the service environment and design life. Plain concrete is strong in compression while weak in tension. The idea of reinforcing concrete with steel bars gave rise to a new composite called Reinforced Concrete which is capable of withstanding both compression and tension simultaneously. Thus reinforced concrete has become the most commonly used construction material.

Keywords: binding materials, mesh materials, mesh confined concrete.

1. INTRODUCTION

Concrete is a widely used construction material in buildings and several structures for a quite long time. Concrete can be defined as a composite binding material having constituents as aggregate, finer sand and fine cement and water in predefined proportion so as to achieve required strength .Concrete is a composite having properties that change with time. Durability of concrete depends on many factors including its physical and chemical properties, the service environment and design life. Plain concrete is strong in compression while weak in tension. The idea of reinforcing concrete with steel bars gave rise to a new composite called Reinforced Concrete which is capable of withstanding both compression and tension simultaneously. Thus reinforced concrete has become the most commonly used construction material.

2. LITERATURE REVIEW

Title- Behaviour of concrete subjected to high temperature
Author- Abhinandan Gupta

This paper discussed about the behavior of concrete at various temperature and changes in its compressive strength and physical properties. He was designed for normal M20 grade of concrete subjected to various temperatures. The specimens were casted and heated to a temperature of about 600°C. Based on experimental results he was summarized that at 150°C the strength increases by 9.03% and at 300°C it got decreased by 12.23% and at 450°C the strength was decreased by 0.80% and at 600°C the concrete got poorly damaged. He was concluded that up to 150°C, the strength of concrete increases to some extend after that strength decreases.

Title - Performance of high strength concretes at elevated temperatures
Author – Bastami

This paper investigated about the effect of temperature on compressive strength, spalling and mass loss of High Strength Concretes (HSCs). The materials used for casting the specimens are cement, coarse aggregate, silica fume and fine aggregate. The specimens were casted and heated to a temperature of about 800°C at 20°C/min. Based on results they were summarized about the sf (silica fume)had an important role on normal compressive strength but did not affect the relativestrength of the heated specimens, while it controls spalling ratio significantly.

Title - Compressive strength of conventional concrete and high strength concrete with temperature effect
Author – Pathan

This paper discussed about the effect of sustained temperatures on strength properties of High Strength Concrete and its comparison with ordinary Conventional Concrete. The specimens were casted and heated to a temperature of about 250°C. Based on experimental results they were concluded that High Strength Concrete and ordinary concrete is dropped considerably up to 200°C and the compressive strength loss in High Strength Concrete is higher than the ordinary concrete because of the quantity of cement required is about 5-20% less than that of ordinary concrete.

3. OBJECTIVES

The objective of the project work is to study the properties of ordinary conventional concrete (OCC) and mesh confinement concrete exposed to temperature and cooled the specimens by quenching method and air-drying method.

4. METHODOLOGY

The first step in this study was review the literature and collects the materials for experimental work. Here the four types of meshes such as glass, wire, GI weld and nylon

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Overview - of Seismic Resistance of Railway Steel Trusses Bridges Using Splice Connection

V Ravi sankar [1] and J Umanambi [2]

[1]PG Student, Paavai Engineering College, Namakkal

[2]Associate professor, Department of Civil Engineering, Paavai Engineering college, Namakkal.

Email id : mmc_ravisankar@yahoo.co.in

Abstract:

This paper presents overview of a seismic assessment of multi-span steel railway bridges and preventive seismic performance of steel structures. The main concept is splice connection use to steel members in railway bridge seismic behaviour and safety under seismic conditions. The newly developed splice connection in main girder , longitudinal girder trusses members used in railway bridges under reversal cyclic loading to evaluate seismic performance. Seismic performance is evaluated based on hysteretic behaviour, strength, ductility, stiffness, and energy dissipation.

key words : steel connection, splice connection , railway bridges, steel joint seismic

I Introduction

According to the recent Indian standard code on earthquake resistant design of structures, more than 60-65% of the area of our country falls under seismic zone III or above. This underlines the importance of seismic detailing. In any structure, the joints assume more importance and have to be detailed carefully so that they are able to withstand the inelastic joint rotations (in the order of 0.04 radians) and drift that may result during an earthquake. The detailing of reinforced concrete structures have been covered adequately in the Indian codes. However, until recently such detailing of joints in steel structures was not covered in the Indian code on steel structures. Though the recent version of the code, IS 800:2007, contains provisions for design and detailing for seismic loads, it does not suggest the type of connections which are suitable for high or intermediate seismic zones. **A Jayaraman et al., (2018)** in this research work, the design based on IS 800:2007, IS 801:1975 and IS811:1975 the study is carried out to earthquake code book IS1893 (Part1):2002 and analysis is done by a industrial structure in both conventional steel and

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Optimization of Construction Cost In Residential Building

K.Sharmila Devi
Assistant Professor, Dept of Civil Engineering
Paavai Engineering College, Namakkal

Abstract- *in this project we are presenting the details about low cost construction of a residential building. Cost optimization aims to cut down the construction cost by using alternatives to the conventional methods. The estimation of 1330 sq.feet residential building is made about Rs. 30, 75,000. In this building, we have implementing the new construction techniques and materials to achieve the cost optimization. The various techniques and materials adopted in this project are filler slab technique, ferrocement door, terracotta hollow block and manufactured sand to attain the economy in construction. This methodology brings down the total cost of building by lowering the cost in both materials and labor aspects. It is necessary to achieve the cost optimization of the building without sacrificing the strength at any situation. It should be noted that low cost housings are not houses which constructed by cheap building materials but it is using the substandard quality material. High efficiency of workers, minimize waste in design and good management practices can also paved the way for cost optimization. Suggestion for reducing construction cost in this paper is of general nature and it varies depending upon the nature of the building to be constructed and budget of the building.*

Keywords- filler slab technique, ferrocement door, terracotta hollow block, manufactured sand.

I. INTRODUCTION

The cost optimization is a process that should be carried out throughout the construction period to ensure that the cost of the building is kept within the estimated cost limits. Cost optimization of a project involves the collecting and measuring the cost record of a project and the work progress. It also includes the comparison of actual progress of project cost with the estimated. Many of challenges has to be faced by the construction industries which includes design and constructability issues, time and cost related issues, rising material and labor costs, structural changes. The cost optimization can divide into two major areas; the optimization of cost during design stages and the optimizing the cost by the contractors once the construction ofproject has started.

Cost optimization of a project involves collecting and measuring the cost record of a project and the work progress. It also includes the comparison of actual progress of project cost with the estimated. The main objective of cost optimization of a project is to gain the maximum profit within the design period and with satisfactory quality of work. It is necessary to decide which optimization is required and amount of detail that will be in used into the construction stage. The cost itself is a major difficulty in operating a detailed cost optimization system. It is an expensive operation for a large contract to carry out a detailed cost optimization system.

- **Filler Slab Technique**

Filler slab technology is a simple and very innovative technology for a slab construction. Concrete is good in taking compression and steel is good in tension. Thus RCC slab is a product which resists both compressions as well as tensile. Filler slab is a very cost effective roofing technology. It is not easy to remove, the concrete from the tension zone, hence concrete can be replace (partially) that part of concrete using light weight and low cost filler material. This method of construction is called filler slab. Filler slab technology is being used across India, but substantial amount of work on the successful promotion and mostly adopted in South India.

- **Manufactured Sand**

River sand is a widely used construction material all over the world, especially in the production of concrete, cement-sand mortar and concrete blocks. Various Government, Non-Governmental Organizations and Research Institutes are striving to identify alternative materials to supplement river sand. There is a strong need for research on river sand substitutes for concrete production and cement sand mortar production. Manufactured sand is popularly known by several names such as Crushed sand, Rock sand, Green sand, UltraMod Sand, Robo sand, Poabs sand, Barmac sand, Pozzolana sand etc. IS 383-1970 (Reaffirmed 2007) recognizes manufacture sand as "Crushed Stone Sand".

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Workability and Strength Properties of SCC made with Processed RCA

Praveen Kumar. T [1], Sharmila Devi. K [2], Umanambi.J [3]

[1]*P.G Student, Department of Civil Engineering, Paavai Engineering College,*
[2]*Assistant Professor, Department of Civil Engineering, Paavai Engineering College, Tamil Nadu, India.*
[3]*Head of Department, Department of Civil Engineering, Paavai Engineering College, Tamil Nadu, India.*

Abstract – *Concrete is the most commonly used material in civil engineering and the main component of most infrastructures. For the foreseeable future, there seems to be no alternative to concrete and building materials. Although the strength of the concrete is the most important factor, it is also necessary that the concrete be strong, good life and durable. In this paper, the mechanical properties of self-compacting fly ash concrete with recycled aggregates (RCA) were investigated. The RCA comes from local construction and demolition waste. The natural substitution of coarse aggregates by recycled coarse aggregates varies in self-compacting concrete between 0 to 50% at 10% interval. This study uses a commonly available class F fly ash as viscosity modifying agents. In this study the influence of the treated RCA on the SCC of grades M30 and M40 was measured.*

Key Words: Self Compacting Concrete, Recycled Concrete Aggregate, Strength Properties

1. INTRODUCTION

According to the World Commission on Environment and Development, sustainability means "meeting the needs of the present without compromising the ability of future generations to meet their own needs." Sustainability is an idea that aims to preserve the health of our planet and to continue to grow and human development.

SCC settles due to its own weight and is almost completely deaerated when filling the formwork. In SCC, No additional internal or external vibration is required for compaction. Even with components with heavily congested reinforcements, all voids and spaces are completely filled. SCC flows like a "honey" and has a near horizontal concrete height after laying (less screed). In terms of composition, SCC consists of the same constituents as conventional normal vibrated concrete, namely cement, aggregates, water and admixtures. A comparison of a typical SCC and conventional concrete mix composition is shown in Figure 1.

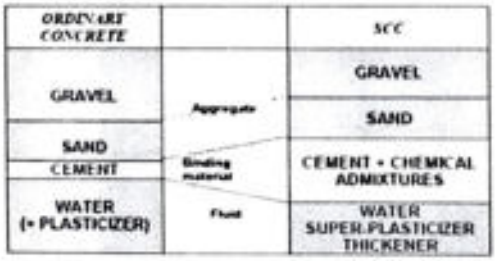

Fig -1: Comparison of Conventional and SCC

Fresh and hardened properties of SCC directly depends on the mix design, should not be different from normal concrete, the only exception is its consistency. However, the high level of super-plasticizers to lower the liquid limit and improve the workability, the high powder content as a "lubricant" for coarse aggregates and the use of viscosity agents to increase the viscosity of the concrete were taken into account.

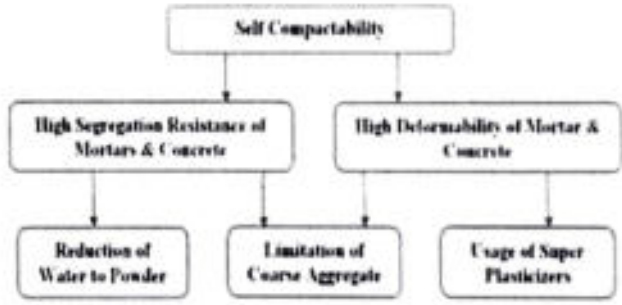

Fig -2: Basic Principles of SCC

1.1 Advantages of SCC

It has been proved economically beneficial because of a number of factors as noted below (ENFARC, 2002):

- Faster construction & Easier placing,
- Reduction in site manpower
- Uniform and complete consolidation,
- Better surface finishes,
- Improved durability,
- Increased bond strength,
- Greater freedom in design,
- Reduced noise levels, due to absence of vibration
- Safe working environment.

1.2 Disadvantages of SCC

- There is no globally accepted test standard to undergo SCC mix design
- The cost of construction is costlier than the conventional concrete construction
- The use of designed mix will require more trial batches and lab tests
- Measurement & monitoring must be more precise.

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Effect of Curing Temperature on the Strength Properties of M30 Grade GPC made with M-Sand

Manivannan.S[1], Gayathri.S[2], Umanambi.J[3]

[1]P.G Student, Department of Civil Engineering, Paavai Engineering College,
[2]Assistant Professor, [3]Head of Department, Department of Civil Engineering, Paavai Engineering College,
Tamil Nadu, India.

Abstract - *The cement industry is one of the main producers of greenhouse gases. Therefore, efforts are needed to make the concrete more environmentally friendly by using fly ash, which helps to overcome global warming and the problems arises in the disposal of fly ash. This article deals with the development of intermittent connection materials in the construction industry. Fly ash based Geopolymer Concrete is a reliable choice, but requires thermal hardening for the polymerization process. In this work we try to investigate the influence of temperature and type of curing on the strength properties of fly ash based geopolymer concrete, with the fine aggregate being replaced by M-sand. Geopolymer concrete grade M30 was prepared with chemically activated treated fly ash using alkaline solutions such as sodium silicate (Na_2SiO_3) and sodium hydroxide (NaOH). In this study, a concentrated solution of 16 M sodium hydroxide is used. All samples were cured at different temperatures in an oven at 60°C, 80°C, 100°C, 120°C and 140°C for 16 hours and tested for 7 days. It was concluded that GPC blends cured at 100°C give better results than specimens treated at other curing temperatures.*

Key Words: Geopolymer Concrete, Oven Curing, M-Sand, Alkaline Solution

1. INTRODUCTION

Concrete is the most commonly used building material, consisting of a mixture of cement, sand, coarse aggregates and water. Ordinary portland cement (OPC) is conventionally used as a primary binder for concrete production. Producing one ton of cement requires about 2 tons of raw materials, shale and limestone, and releases a large amount of carbon dioxide (CO_2) into the atmosphere, which contributes significantly to the greenhouse effect. The amount of CO_2 released during the manufacturing process of OPC is of one ton per ton of OPC produced. Worldwide, OPC production accounts for about 7% of global CO_2. That brings about 1.6 billion tons of CO_2 into the atmosphere.

Therefore, it is necessary to find another type of binder to make a greener concrete. The use of industrial by-products in this sector could become an important way for the large-scale and safe disposal of industrial waste and the reduction of construction costs.

1.1 Geopolymer Concrete

Davidovitts completed a very important study in 1978 by discovering geopolymer concrete, which was concrete without cement. This has attracted many attentions, where fly ash has completely replaced the cement. He had his own qualities and left extraordinary impressions in research studies.

The geopolymer is an inorganic alumina-silicate compound made from materials of geological origin or derived materials such as fly ash, rice husk, etc., which are rich in silicon and aluminum. Geopolymers technology could reduce the atmospheric CO_2 emissions of the cement and aggregates industry by about 80%. Direct alkaline activation of industrial waste, such as fly ash, can produce a geopolymer that can be used to construct new concrete for construction. This can be considered as a sustainable approach to construction, as the internal energy content of these new concretes is much lower than that of ordinary Portland cement concrete (OPCC), making Portland cement, one of the largest contributors to the greenhouse, completely eliminate gas emissions.

1.2 Fly Ash Based Geopolymer Concrete

Fly ash is one of the most abundant materials on earth. Due to its role in geopolymerization, it is also a crucial component in the production of geopolymer concrete. Fly ash is a pozzolan powder. A pozzolan is a material that has cementing properties in combination with calcium hydroxide. Fly ash is the major by-product of coal combustion in coal power plants.

Geopolymer concrete generally requires the use of class F fly ash. In this project, a low-calcium fly ash-based geopolymer (ASTM grade F) is used as the binder. Fly ash geopolymer paste binds coarse aggregates, fine aggregates and other unreacted materials to geopolymer concrete with or without excipient.

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RESEARCH ARTICLE OPEN ACCESS

Effective Utilization of Plastic Wastes in Tile Manufacturing: A Step Towards Sustainability

V.Mohan[a], S.Gayathri[b]

[a] PG student (Structural Engineering), Department of Civil Engineering, Paavai Engineering College, Pachal.

[b] Assistant Professor, Department of Civil Engineering, Paavai Engineering College, Pachal.

Abstract:

In India, 70 percent of total plastic consumption is discarded as waste. Around 5.6 million tonnes per annum (TPA) of plastic waste is generated in country, which is about 15,342 tonnes per day (TPD). To a large extent in India, plastics management is seen more as a waste management rather than generation of plastics. Another major concern about plastics in the waste stream is their longevity and whether or not they are truly biodegrade. It is estimated that most plastics would take 500-1000 years to break down into organic components. Because of this longevity and the low rate of recycling, much of our plastic waste ends up in landfills or as litter. Some of this plastic waste makes its way via rivers and wind to the ocean. Garbage barges, and the trans-continental transport of recyclable materials also lead to an increasing amount of plastics in our oceans and waterways. *Plastics* have a high energy content that *can be converted to* electricity, synthetic gas, fuels and recycled feedstocks for new *plastics* and other products of chemistry. Recovering this abundant energy also reduces *waste* sent *to* landfills and complements *plastics* recycling. Hence keeping all these factors in mind, it is liable to utilize plastic waste into useful construction material. Hence an attempt is made to utilize plastic in manufacturing of tiles with suitable proportions. Experiments are conducted to assess the compressive strength, rupture, abrasion, impact strength and water absorption. SEM analysis is performed to examine the micro level distribution of plastic wastes in manufactured tiles. It is believed that such initiative will lay the path towards the goal of "waste to wealth".

Keywords *: Plastic waste, flooring material, waste utilization*

I. Introduction

India is facing a serious challenge in disposing waste in many landfills throughout the country. The landfills situation is resulting in high disposal cost and potential environmental problems. If current trend continues, with waste production projected to grow by each year. A product that would help old age/disabled people by protecting them from skidding. A beneficiary product that could be helpful in the

future to face upcoming energy crisis times. Development of low cost tiles affordable by all community of the society. It means that made a low coast material tiles in that piezo electric sensor is embedded inside so it will absorbs energy in day time and it will release energy at night time through the light emitting tiles without current. According to Government of India, more than 15,000 tons of plastic waste are generated in India every day, of which 6,000 tones remain uncollected and littered. Such huge waste

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EXPERIMENTAL STUDY ON SELF COMPACTING CONCRETE USING GGBS

R.Selvapriya[1]; M.Rajkannan[2]

[1]PG student(Structural Engineering), Civil Department, Paavai Engineering College, Pachal.

[2]Assistant Professor, Civil Department, Paavai Engineering College, Pachal.

Abstract

Ground granulated blast furnace slag (GGBS), due to its pozzolanic nature, could be a great asset for the modern construction needs, because slag concretes can be of high performance, if appropriately designed. The use of GGBS as a cementitious material as well as fine filler is being increasingly advocated for the production of High performance concrete (HPC), Roller compacted concrete (RCC) and Self compacting concrete (SCC), etc. However, for obtaining the required high performance in any of these concrete composites, slag should be properly proportioned so that the resulting concrete would satisfy both the strength and performance criteria requirements of the structure. The paper is an effort towards presenting a new mix design methodology for the design of self compacting GGBS concretes based on the efficiency concept. The methodology has already been successfully verified through a proper experimental investigation and the self compacting slag concretes were evaluated for their self compactability and strength characteristics. The results indicate that the proposed method can be capable of producing high quality SCC.

KeyWords: Self compacting concrete, Compressive Strength, split tensile strength, Flexural strength, GGBS, admixtures, plasticizers.

I. INTRODUCTION

Green concrete is very often also cheap to produce, because, for example, waste products are used as a partial substitute for cement, charges for the dumping of waste are avoided, energy utilization in production is inferior, and durability is superior. In India there is an extreme manufacture of fly ash as it is used in the production of electricity in nuclear power plants. Ground granulated blast furnace slag (GGBS)then dried and ground into a fine powder. By well judged use of available materials for concrete making and their proportioning, concrete mixes are produced to have the desired properties in the fresh and hardened states, as the situation demands.

Waste can be used to fabricate new products or can be used as admixtures so that natural sources are used more effectiveness and the environment is sheltered from waste deposits. To avoid the toxic waste and reprocess the waste material, the present study is carried out.

As the properties are as good as the cement, the Class F fly ash (coal fly ash) and Ground granulated blast furnace slag (GGBS) is used as fine partial replacement in the cement in Self compacting concrete.

Self – compacting concrete (SCC) is a fluid mixture, which is suitable for placing difficult conditions and also in congested reinforcement, without vibration. In principle, a self – compacting or self – consolidating concrete must:

- Have a fluidity that allows self – compaction without External energy
- Remain homogeneous in a form during and after the placing process and
- Flow easily through reinforcement

Self – consolidating concrete has recently been used in the pre – cast industry and in some commercial applications, however the relatively high material cost still hinders the wide spread use of such specialty concrete in various segments of the construction industry, including commercial and residential construction.

Compared with conventional concrete of similar mechanical properties, the material cost of SCC is more due to the relatively high demand of Cementation materials and chemical admixtures including high – range water reducing admixtures (HRWRA) and viscosity enhancing admixtures (VEA). Typically, the content in cementation materials can vary between 450 and 525 Kg/m^3 for SCC targeted for the filling of highly restricted areas and for repair applications. Such application required low aggregate volume to facilitate flow among restricted spacing without blockage and ensure the filling of the formwork without consolidation. The incorporation of high volumes of finely ground powder materials is necessary to enhance cohesiveness and increase the paste volume required for successful casting of SCC. Proper selection of finely ground materials can enhance the packing density of solid particles and enable the reduction of water or HRWRA demand required to achieve high deformability. It can also reduce viscosity for a given consistency; especially in the case of SCC made with relatively low Water – Binder ratio. Reducing the free water can decrease the VEA dosage necessary for Stability.

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Experimental Investigation of Magnesium Phosphate Cement Based Concrete

S. Priyadarshika[1], M. Rajkannan[2]

[1]PG student (structural Engineering), [2]Assistant Professor,
[1,2]Civil Department, Paavai Engineering College, Pachal, Tamil Nadu, India

ABSTRACT

This project shows the results of an experimental study on the Magnesium phosphate cement for repair work in concrete mixed with coarse aggregate and fine aggregate. The percentage of Magnesium phosphate cement used in concrete and cement was replaced with 0%, 5% and 10%. The effects of curing for 7, 14 and 28 days on strength of concrete were studied. Experimental results indicate that the increase in the proportions of Mineral Admixtures resulted in an increase or decrease in the strength of concrete. The overall test performance revealed that Magnesium phosphate cement can be utilized as a partial replacement of cement in high strength concrete. The Mix Design for concrete M60 grade is being done as per the Indian Standard Code IS: 10262-2009.

KEYWORDS: *Magnesium phosphate cement, coarse aggregate, fine aggregate*

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1. INTRODUCTION

1.1. CONCRETE

Concrete is a composite material composed of fine and coarse aggregate bonded together with a fluid cement (cement paste) that hardens (cures) over time. In the past lime based cement binders were often used, such as lime putty, but sometimes with other hydraulic cements, such as a calcium aluminate cement or with Portland cement to form Portland cement concrete (for its visual resemblance to Portland stone) Many other non-cementitious types of concrete exist with different methods of binding aggregate together, including asphalt concrete with a bitumen binder, which is frequently used for road surfaces, and polymer concretes that use polymers as a binder.

Concrete structure may often suffer from an unexpected deterioration in terms of pop-out arising from physical/chemical delamination and corrosion of steel reinforcement. Moreover, internal cracking has still a potential risk of degradation of concrete properties, subsequently leading to structural failure. Thus, regular repair and rehabilitation would be required to secure a structural safety. However, unlike other civil infrastructures, the traffic restriction during the repair of pavement costs high; only a couple of hours are given for the repair treatment at night to avoid congestion of transportation. Additionally, the conventional repair materials such as Ordinary Portland Cement and hot-mix asphalt may face early degradation due to a debondment from the existing substrate.

1.2. MAGNESIUM PHOSPHATE CEMENT CONCRETE

Magnesium phosphate cement, also known as MPC, is a high performance, quick setting cement binder that has a multitude of beneficial properties when compared to Ordinary Portland Cement (OPC) binder systems.

MPC cement provides a fast-setting, strong and durable binder system for a wide variety of construction products applications for both external and internal use. The binder system bonds tenaciously to a wide variety of aggregates, fillers, and fibers allowing a broad choice of ingredients while maintaining sufficient compressive strength and integrity even at low binder ratios. The binder system also bonds with a wide variety of substrates such as itself, concrete, asphalt, metals, wood, and a variety of plastics thus providing a wide spectrum of potential applications. The main applications for MPC binder systems are for dry shotcrete mixes, for rapid setting and hardening patching mortar or dry-mix products, and protective coatings.

1.3. OBJECTIVE OF THE STUDY

The present study on magnesium phosphate cement concrete has the following objectives.

RESEARCH ARTICLE OPEN ACCESS

STUDY ON EFFECTS OF LIGHT WEIGHT AGGREGATES ON COMPRESSIVE AND FLEXURAL STRENGTH OF CONCRETE

S.Thenmozhi[a]; M.Rajkannan[b]

[a] PG student(Structural Engineering), Civil Department, Paavai Engineering College, Pachal.

[b] Assistant Professor, Civil Department, Paavai Engineering College, Pachal.

Abstract:

The present day world is witnessing construction of very challenging and difficult civil engineering structures. In this study comparison has been made between plain cement concrete and light weight concrete having different proportion of aggregates and admixtures. i.e., Expanded Clay Aggregates: 0%, 25%, 50%, 75% and 100% with coarse aggregate, silica fumes 10% and PVA(Poly Vinyl Alcohol) 1.6% of constant replacement with cement and water respectively. It helps to increase the volume of concrete and hence reduce the weight. In Design of concrete structures, light weight concrete plays a prominent role in reducing the density and to increase the thermal insulation. These may relate of both structural integrity & serviceability. More environmental and economical benefits can be achieved if waste materials can be used to replace the fine light weight aggregate.

Key words: Expanded Clay Aggregate, Silica fume, Poly Vinyl Alcohol (PVA), Density, Compressive strength, Flexural strength.

INTRODUCTION

Lightweight concrete is a type of concrete contains expanded light weight aggregates which increase the volume of the mixture while giving additional qualities such as lowering the dead weight.

Lightweight concrete maintains its large voids and not forming laitance layers or cement films when placed on the wall. This research was based on the performance of light weight concrete using expanded clay aggregate. However, sufficient water cement ratio is vital to produce adequate cohesion between cement and water. Lightweight concrete is usually chosen for structural purpose where its use will lead to a lower overall cost of a structure than normal weight concrete

This research report is prepared to show the activities and progress of the lightweight concrete research project. The performance of lightweight concrete such as compressive strength tests, water absorption and density and supplementary tests and comparisons has been made with nominal concrete.

Most of the normal weight aggregate of normal concretes is natural stone such as lime stone and granite. With the increasing amount of concrete used, natural environment and resources are excessively exploited. Synthetic light weight aggregate produced from environmental waste like fly ash, is a viable new source of structural aggregate material. The use of light weight concrete permits greater design flexibility and substantial cost savings, reduced dead load, improved cyclic loading, structural response, longer spans, better fire ratings, thinner sections, smaller size structural members, less reinforcing steel and lower foundations costs. Other inherent advantages of the material are its greater fire resistance, low thermal conductivity, low coefficient of thermal expansion and lower erection and transport costs for prefabricated members.

Structural lightweight aggregate concretes are considered as alternatives to concretes made with dense natural aggregate because of the relatively high strength to unit weight ratio that can be achieved. Other reasons for choosing lightweight concrete as a construction material is more attention is being paid to energy conservation and to the usage of waste materials to replace exhaustible natural sources. Lightweight aggregate, due to their cellular structure, can absorb more water than normal weight aggregate. In a 24-hour absorption test, they generally absorb 5 to 20% by mass of dry aggregate, depending on the pore structure of the aggregate. Normally, under conditions of outdoor storage in stockpiles, total moisture content does not exceed two-thirds of that value.

This means that lightweight aggregate usually absorb water when placed in a concrete mixture, and the resulting rate of absorption is important in proportioning lightweight concrete. Due to this more

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Experimental Study on Mechanical Properties of Sintered Fly Ash Aggregate in Concrete

Anupriya T[1], Jayapal A[2]

[1]PG Student, [2]Assistant Professor
[1,2]Civil Engineering Department, Paavai Engineering College, Namakkal, Tamil Nadu, India

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ABSTRACT

There is heavy demand for the building materials in the domestic market, which is becoming scarce day by day. Presently in India the power sector depends on coal based thermal power station, which produce a huge amount of fly ash approximately to be around 200 million tones annually. The mass utilization of fly ash in concrete, essentially focused on sintered fly ash aggregate replaced by natural coarse aggregate is thought of in this investigation.

Keywords: *Sintered fly ash, fly ash, conventional concrete, compressive strength, natural course aggregate*

1. INTRODUCTION

1.1. GENERAL

In many countries, due to the increasing cost of raw materials and the continuous reduction of natural resources, the use of waste materials is a potential alternative in the construction industry. Waste materials, when properly processed, have shown to be effective as construction materials and readily meet the design specifications. The continued and expanding extraction of natural aggregate is accompanied by serious environmental problems. Often it leads to irremediable deterioration of rural areas, since quarrying of aggregates alters land topography and causes other potential problems, such as erosion. The artificial aggregates from industrial and post-consumer wastes are not only adding extra aggregate sources, but also reduce environmental pollution.

Fly ash disposed from thermal power plant is being beneficially utilized for various civil engineering applications such as for the production of blended cement, fly ash bricks, lightweight concrete blocks and lightweight aggregates. Presently in India the power sector depends on coal based thermal power station which produce a huge amount of fly ash approximately to be around 200 million tonnes annually. However, the utilization of fly ash is about 30% in concrete applications as cement replacement material. This replacement level needs to be increased and high volume fly ash addition in the future is well anticipated. The mass utilization of fly ash in concrete essentially focused as cement Replacement material or as aggregate fillers.

1.2. CHARACTERISTIC FEATURES OF FLY ASH

Fly ash is finely divided residue resulting from the combustion of powdered coal and transported by the flue gases and collected by electrostatic precipitation. It is the most widely used pozzolanic material all over the World. In recent time, the importance and use of fly ash in concrete has grown so much that it has almost become a common ingredient in concrete, particularly for making high strength and high performance concrete. Extensive research has been done all over the world on the benefits that could be accrued in the utilization of fly ash as a supplementary cementitious material.

ASTM broadly classify fly ash into two classes,

Class F: Fly ash normally produced by burning anthracite or bituminous coal, usually has less than 5% CaO. Class F fly ash has the pozzolanic properties only.

Class C: Fly ash normally producing by burning lignite or subbituminous coal. Some class C fly ash may have CaO content in excess of 10%. In addition to

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Experimental Study on Composite Concrete RC Frame Structure using Sisal Fibre

P. Vanmathi[1], A. Dharani[2]

[1]PG Student (Structural Engineering), [2]Assistant Professor,
[1,2]Civil Department, Paavai Engineering College, Pachal, Tamil Nadu, India

ABSTRACT

This project aims to compare the mechanical properties of Sisal fiber in the improvement of load carrying capacity of concrete structure in different layers. Beams and columns may be strengthened in flexure through the use of sisal fiber bonded to their tension zone using epoxy as a common adhesive. Due to several advantages of sisal fibre wrapping over conventional techniques used for structural repair and strengthening. In our project is study about load carrying capacity of an RCC frame wrapped with sisal fiber. An experimental study is to predict the maximum load carrying capacity, deflection of the composite RCC structure. Finally the results are compared with conventional framed structure, which is suitable for strength and rehabilitate the concrete structure.

KEYWORDS: Sisal fibre, Fibre, RC Frame, Composite Structure and Sisal Fibre Composite

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I. INTRODUCTION

CONCRETE

Concrete is a composite material that consists of a cement paste within which various sizes of fine and course aggregates are embedded. It contains some amount of entrapped air and may contain purposely-entrained air by the use of air-entraining admixtures. Various types of chemical admixtures and/or finely divided mineral admixtures are frequently used in the production of concrete to improve or alter its properties or to obtain a more economical concrete.

SISAL FIBRES

Fibres are usually used in concrete to control cracking due to both plastic shrinkage and drying shrinkage. They also reduce the permeability of concrete and thus reduce bleeding of water. Some types of fibres produce greater impact, abrasion and shatter resistance in concrete. Generally fibres do not increase the flexural strength of concrete, and so cannot replace moment resisting or structural reinforcement. Indeed, some fibres actually reduce the strength of concrete. The amount of fibres added to a concrete mix is expressed as a percentage of the total volume of the composite (concrete and fibres), termed volume fraction (Vf). Vf typically ranges from 0.1 to 3%. Aspect ratio (l/d) is calculated by dividing fibre length (l) by its diameter (d). Fibres with a non-circular cross section use an equivalent diameter for the calculation of aspect ratio. Sisal is a bio degradable organic fibre material containing 46% lignin, 54% cellulose. Because its high content of lignin, sisal is much more advantageous than other natural fibres.

II. OBJECTIVES OF THE STUDY

The main objectives of this study are,

1. To study the mechanical properties of conventional concrete structure and compare with sisal fibre wrapped concrete structure. To determine the bond strength between sisal fibre concrete.
2. To determine the flexural strength of sisal fibre reinforced concrete beam with sisal fibre.
3. To compare the flexural behaviour of sisal fibre reinforced concrete beams with conventional concrete structure.

III. SCOPE FOR STUDY

1. Natural fibres as reinforcement in composites have been studied by many researchers only for non-structural members.
2. Natural fibres are good alternative at lower cost and promote sustainable development. Earthquakes have caused mass destruction of buildings because of non-engineered constructions.
3. A sisal fibre is exceptionally durable and require low maintenance with minimum wear and tear. Sisal is one of the promising natural fibre.

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Wavelet Filter for Alzheimer's Classification from MRI Images using Adaboost

Revathi.M[1], Singaravel.G [2]
[1] *Assistant Professor, Department of Computer Science and Engineering, Paavai Engineering College, Namakkal, India*
[2] *Professor,Department of Information Technology, K.S.R College of Engineering, Namakkal, India*

Abstract

Alzheimer's Disease (AD) is a disorder of the brain which is progressive, destroying memory and the ability to think. The patients of AD suffer from problems such as lack of initiative, change in personality and behavior which is seen in their daily functions either at work or home and also in taking care of oneself which eventually results in death. One widely used technique for diagnosing of the AD is Magnetic Resonance Imaging (MRI) owing to its non-invasive nature and is widely adopted in several hospitals to examine certain cognitive abnormalities. The MRI images are processed using image processing techniques to identify the AD. Image processing techniques extract features from the images and classify them as either normal or abnormal (AD). The primary reason for the robustness of the Wavelet Transform is its flexibility in choosing bases and also its low level of complexity of computation. The basic idea behind the AdaBoost algorithm was that it was a combination of the weak classifiers to build a robust classifier. In this work, an improved wavelet filter is proposed to classify Alzheimer's using MRI images with a modified AdaBoost.

Keywords: *Alzheimer's Disease (AD), Wavelet transform, Magnetic Resonance Imaging (MRI), AdaBoost algorithm Minimum*

1. INTRODUCTION

Alzheimer's Disease (AD) has not always been related to aging. It is a classification of dementia which results in issues connected to memory, behavior, and thinking patterns. The actual signs of AD develop quite slowly and get worse over time. This can, at times, get very severe and can also interfere with daily life and may also lead to death. Until today, there has been no cure that is identified for this disease. Identification of AD in the early stage helps in slowing the progress of disease.

Another very promising research area to detect the AD is neuroimaging. There have been multiple processes of brain imaging that may be used for the identification of brain abnormalities which includethe PET, the MRI, and the CT scans. Every scan includes a new and unique technique that detects certain structures, as well as abnormalities identified in the brain.

A fusion of such techniques will improve the accuracy of classification. Almost all recent approaches to computer-aided machine learning make use of a fusion of techniques of neuroimaging and a similarmodel for classification is applied to the

Patients that do not have tailoring of any diagnostic decisions as they tend to assume the biomarkers to be readily available at the same time [1].

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RELIABLE AND ENERGY EFFICIENT WBAN THROUGH ON-DEMAND HANDOVER PROTOCOL

J. Karthik[1], Dr. B. Shanthini[2]

[1]*Research Scholar, CSE Dept, SPIHER, Avadi, Chennai, TN, India.*

[2]*Professor and Head, IT Dept, SPIHER, Avadi, Chennai, TN, India.*

Abstract

In recent years, innovation in technological development makes human work easy. More specifically the development in the field of medical is unimaginable. Nowadays medical treatments were enhanced and more medical equipments were developed to detect the disease and also to monitor the human health. But the patient needs to be stayed in the hospital until they recover from the ill. Some health issues may take even couple of months to few years. In that case Wireless Body Area Networks provide facility to make the patient stay in the home by using wearable body sensors. These sensors can be fixed inside the human body or outer surface of the body to observe the body conditions. These wearable sensors are small in size and they were designed to carry easily. Since the body sensor node is small, the battery capacity is also very less. So, the effective utilization of the energy is much important for avoiding the replacement ofbattery very often. At the same time patients can move freely inside their home, during that time there maybe chance for obstacles like wall and furniture that act as a barrier for the communication between the sensor node and access point. Therefore the data from the sensor node is being transmitted through other access point to increase the reliability. But the number of times handover the signal from one access pointto other access point is also consumes more energy. So the proposed On-Demand Handover Protocol willestablish the connection with new access point only if the data is very much essential. Otherwise sensor will omit the data and continue to sense the value without considering the signal strength of the existing connection. This proposed On-Demand Handover Protocol endow with energy efficient and reliable network.

Keywords: *Handover Protocol, Wireless Body Area Network, Reliability, Energy Efficient*

1. INTRODUCTION

Wireless Sensor Networks used for monitoring agriculture land, traffic signals, underwater changes, human health, climatic conditions, etc. Wireless Body Area Network made up of more number of physiological sensors. These sensors are helps to monitor the human health. All sensors are integrated to form sensor network. Human health conditions can be detected using this Wireless Body Area Network.

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Maximize Body Node's Lifetime Through Conditional Re-transmission

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- J. Karthik (1) Email author (karthikvalavan@gmail.com)
- A. Rajesh (2)

1. CSE Department, St. Peter's Institute of Higher Education and Research, , Chennai, India
2. C. Abdul Hakeem College of Engineering and Technology, , Vellore, India

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Abstract

Wireless Sensor Network is greatly evolved in recent years. Technological advancements in wireless networks are intended to develop various fields especially in medical domain. Nowadays, remote health monitoring is possible by the enormous growth of wireless body area sensor networks. The Wireless Body Area Sensor Network monitors the human health by using wearable body sensors, and sends the status of the human health to the medical experts. Body nodes will be placed on, in and around the human body. The major key issue in Wireless Body Area Sensor Network is power management. Since batteries used in sensors are very tiny, it tends to have a minimal lifetime. In order to increase the lifetime of the sensor node, the energy needs to be utilized in an efficient manner. In this paper we have proposed conditional re-transmission technique to minimize the energy consumption. So the sensor nodes lifetime will get increased and in turn Wireless Body Area Sensor Networks lifetime will also be increased. By increasing the lifetime of the sensor nodes, the batteries or sensor nodes need not to be replaced frequently.

Keywords

Remote health monitoring Wireless Body Area Sensor Network Network lifetime Energy consumption Conditional re-transmission

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HOME CONTROL SYSTEM USING ARTIFICIAL INTELLIGENCE

Kaviyaraj R[1], Sundar Raj J[2], Sanjay S.K[3], Rajesh R[4]

[1]Assistan Professor, Dept. of Computer Science and Engineering & Paavai Engineering College, TN, India
[2,3,4]UG Scholar, Dept. of Computer Science and Engineering & Paavai Engineering College, TN India

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Abstract - *A proposal for home control using voice via Google Assistant. We saw many home automation technologies introduced over these years from ZigBee automation, Amazon Echo, Google home etc., it describes the implementation of such a system. The system is implemented using ordinary household appliances Natural language voice commands are given to the Google Assistant and with the help of IFTTT (If This Then That) application and the Adafruit the commands are decoded and then sent to the micro controller, the micro controller in turn controls the relays connected to it as required, turning the device connected to the respective relay On or OFF as per the users request to the Google Assistant. The micro controller used is NodeMCU (ESP8266) and the communication between the micro controller and the application is established via Wi-Fi (Internet).*

Key Words: internet of Thing, NodeMCU (esp8266), Home control, Adafruit, IFTTT, Google Assistant

1. INTRODUCTION

The Internet-of-Things provides lots of sense information from the environment. Home, it is the place where one fancies or desires to be after a long tiring day. People come home exhausted after a long hard-working day. Some are way too tired that they find it hard to move once they land on their couch, sofa or bed. So, any small device/technology that would help them switch theirs lights on or off, or play their favorite music etc. on a go with their voice with the aid of their smart phones would make their home more comfortable.

Moreover, it would be better if everything such as warming bath water and adjusting the room temperature were already done before they reach their home just by giving a voice command. So, when people would arrive home, they would find the room temperature, the bath water adjusted to their suitable preferences, and they could relax right away and feel cozier and rather, feel homelier. Human assistants like housekeepers were a way for millionaires to keep up their homes in the past. Even now when technology is handy enough only the well to do people of the society are blessed with these new smart home devices, as these devices costs are a bit high. However, not everyone is wealthy enough to be able to afford a human assistant, or some smart home kit. Hence, the need for finding an inexpensive and smart assistant for normal families keeps growing. This paper proposes such inexpensive system. It uses the Google Assistant, the IFTTT Web interface, the Adafruit Web Interface and the NodeMCU microcontroller as the major components along with a relay board comprising of 4/8 relays along with ULN 2803 IC. Natural language voice is used to give commands to the Google Assistant. All of the components are connected over the internet using Wi-Fi which puts this system under the IoT.

1.1 OBJECTIVE

Therefore, Home control system to assist common man's life to make his schedule more efficient and help conserve energy; it will also be of great use to handicapped and elderly members of our society.

The project as two modules in totality; the first module consists of control of lights, blinds and fans which will be switched on and off using voice commands on Google assistant. The second module consists of control of common household appliances such as television, projector, air conditioners etc. We intend to attach four loads in this work. The control of the appliances will be done using two methods in particular; they are App and voice control. Voice control can easily be achieved on an Android mobile using Google Assistant.

1.2 PROBLEM STATEMENT

It has never been easier or more affordable to purchase and install smart devices and home control systems. This is a good thing. The drawback, however, is that systems are regularly being installed incrementally without a central control point. And that can lead to home automation problems. Without an understanding of how smart devices communicate, home owners regularly install units which can only be controlled by the manufacturer's app.

The main problems that a home automation system faces are high cost of the system, strenuous configuration and set up process and security of the system. This developed system will be much cheaper than the available systems in the market and cover the control of most of the commonly used home appliances in a house using an Android App and voice control using Google Assistant on the user's mobile. The system is wireless and will be using Bluetooth as well as Wi-Fi to allow the user to control various appliances using their mobile phones, personal computers/ Laptops etc.

2. EXISTING SYSTEM

In the existing system, IOT i.e. IEEE 802.11 b/g/n is used in order to control the home appliances where the home

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IOT ENABLED PRECISION CROP FIELD MONITORING SYSTEM

Kaviyaraj R[1], Balakumaran A[2], Avinankudi M[3], Dhayalan A[4]

[1]*Assistan Professor, Dept. of Computer Science and Engineering & Paavai Engineering College, TN, India*
[2,3,4]*UG Scholar, Dept. of Computer Science and Engineering & Paavai Engineering College, TN India*

Abstract - *As new technologies has been introduced and utilized in modern world, there is a need to bring advancement in the field of agriculture also. Internet of Things (IoT) is being utilized in a few ongoing applications. Various Researches have been undergone to improve crop cultivation and have been widely used. In order to improve the crop productivity efficiently, it is necessary to monitor the environmental conditions in and around the field. The presentation of IoT alongside the sensor organize in agriculture renovate the conventional method for cultivating. Various sensors are used to monitor and collect information about the field conditions. The parameters that must be appropriately checked to improve the yield are soil attributes climate conditions dampness, temperature etc., Offline crop monitoring using IoT helps the farmers to stay connected to his field from anywhere and anytime through SMS alerts or phone calls. Aggregately the yield field condition is sent to the rancher through gsm modem.*

Key Words: Internet of Thing, Arduino, Agriculture, GSM Modem, Sensor Networks

1. INTRODUCTION

The Internet-of-Things provides lots of sense information from the environment. However, the data by themselves do not provide value unless it is converted into some action. Big data and data visualization representation procedures to gain new insights by batch processing and offline analysis. Real time sensor data information and decision making is often done manually but to make it versatile it is ideally mechanized. Artificial Intelligence provides the framework and tools to go beyond trivial real-time decision and automation use cases for IoT.

Use of technology in different areas to get numerous benefits is itself a valuable research. Use of Sensor network in the area of agriculture is not new. But due to the different weather, soil, water and land conditions, diverse models, methods of analysis and solutions are needed on which different communities of researchers are working and proposing several solutions. That instigates need of some different ways specifically for agriculture that can be helpful in developing solution for different conditions. Smart Agriculture concept is the combination of context-aware computing and Wireless Sensors and Actuator Networks (WSAN) application. Smart agriculture proved its viability for the better management of Agricultural requirements.

1.1 Objective

Therefore, an agricultural monitoring system using an IoT to overcome the problems in the agricultural field is proposed in this project. In this, different sensors are used to monitor the agricultural crop field. Temperature sensors are used to monitor the weather of the agricultural crop field. Soil moisture sensor is used to monitor the volume of water present in the soil. Therefore, this sensed data's are transmitted to the user through the gsm modem for providing good yield in crops. In this, gsm modem is used to intimate the information about the agricultural crop field through phone calls or SMS for the farmer. This avoids the physical monitoring of the crop field. In this project, if the temperature value is greater than the threshold value fixed for the temperature, then gsm modem intimates the user temperature is high monitor the crop field. If the water level in the soil is low, then gsm modem intimates the farmer water level is low in the crop field. Therefore, this device is for avoiding physical monitoring of the crop filed and it involves the continuous monitoring of the crop field using weather.

1.2 Problem Statement

This project is from the motivation of the farmers working in the farm lands are solely dependent on the rains and bore wells for irrigation of their land. In recent times, the farmers have been using irrigation technique through the manual control in which the farmers irrigate the land at regular intervals when required. Moreover, for the power indication they are glowing a single bulb between any one of phase and neutral, meanwhile when there is any phase deduction occurs in other phases, the farmer cannot know their supply is low. If they may have to travel so. They may be suffering from hot Sun, rain and night time too. After reaching their farm, they found that there is no power, so they quietly disappointed to it.

2. EXISTING SYSTEM

Agricultural Technology is a specialized area or ground for the growth and farming of plants and vegetables with mechanized and smart equipment. The purpose is to provide suitable conditions and maintain desired parameter values according to the flora requirement. In the present nurseries, numerous parameter estimations are required to screen and control for the great quality and profitability of plants. In any case, to get the coveted outcomes there are some imperative variables which become an integral factor like Temperature,

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Performance analysis of malicious node detection in MANET using ANFIS classification approach

Journal: Cluster Computing > Special Issue 6/2019

Authors: A. Kumaravel, M. Chandrasekaran

Abstract

Security threaten is the primary issue in mobile ad hoc networks (MANET). The efficiency of the MANET system is affected by presence of malicious nodes. It is very difficult task to identify the malicious nodes from the trusty nodes in MANET system due to similar characteristics between malicious and trusty node. This paper proposes an efficient feature extraction based malicious node detection system using adaptive neuro fuzzy inference system (ANFIS) classification approach. In this paper, trust function features and service trust features are extracted from trusty and malicious nodes. These extracted features are trained and classified using ANFIS classifier. The performance of the proposed malicious node detection in MANET system is analyzed in terms of throughput, average packet loss ratio, energy consumption and detection ratio.

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Volume 118, October 2019, Pages 44-51

Full length article

Fiber optic ethanol gas sensor based WO_3 and WO_3/gC_3N_4 nanocomposites by a novel microwave technique

S. Vijayakumar [a], S. Vadivel [b]

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https://doi.org/10.1016/j.optlastec.2019.04.040

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Highlights

- $WO_3/g\text{-}C_3N_4$ composites were successfully synthesized by a one step microwave irradiation method.
- $WO_3/g\text{-}C_3N_4$ has high sensitivity, fast response and recovery time towards ethanol gas.
- The enhancement has been explained by surface O_2 and ethanol gas.
- $WO_3/g\text{-}C_3N_4$ would be promising potential application in gas sensor field.

Abstract

In this report, WO_3/graphitic carbon nitride ($g\text{-}C_3N_4$) composites were successfully prepared through one step microwave irradiation technique followed by direct calcining of

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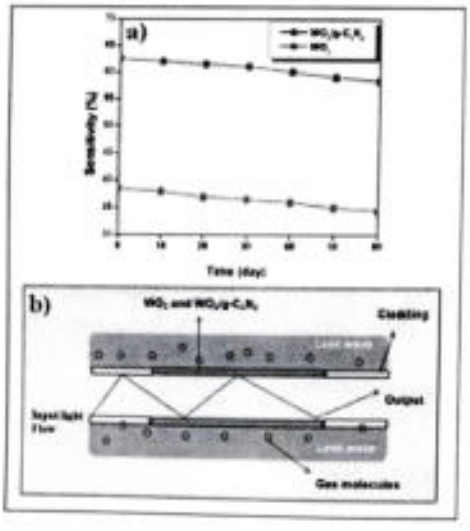
and tungsten in 6+ states in WO_3 nanocrystals. TEM images showed that a serious agglomeration of nanoparticles (25–30 nm), which can be dispersed on the g-C_3N_4 nanosheets. The high surface area of WO_3/g-C_3N_4 (138 $m^2 \cdot g^{-1}$) and the interaction between 2-D g-C_3N_4 and WO_3 could strongly favour of the elevated gas-sensing property. Fiber optic gas sensors with nanostructures of WO_3/g-C_3N_4 as the cladding of a PMMA fiber have been proposed and investigate the ethanol gas sensing test. The WO_3/g-C_3N_4 nanocomposites exhibit excellent selectivity to ethanol gas, such as high sensitivity (62.5 at 500 ppm), faster response (30 s) and recovery time (25 s) than those of the pure WO_3. The possible mechanism for the enhanced ethanol gas sensing properties of WO_3/g-C_3N_4 nanostructures is proposed.

Graphical abstract



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Keywords

WO_3; Carbon nitride; Microwave; Fiber optic; Ethanol gas; High sensitivity

IET Communications

Research Article

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Simultaneous wireless information and power transfer in energy-augmented amplify and forward cooperative cognitive networks

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Cynthia Anbuselvi Thangaraj[1] ✉, *Aruna Velkennedy*[1], *Shiny Ponmani*[1]

[1]*Department of Electronics and Communication Engineering, Thiagarajar College of Engineering, Madurai, TN 625015, India*

✉ *E-mail: cynthiaanbuselvi@gmail.com*

Abstract: Simultaneous wireless information and power transfer (SWIPT) and energy harvesting (EH) have been considered as the promising technique to enhance the lifetime of energy constrained relay nodes of the amplify and forward (AF)-based cognitive wireless network. The amalgamation of cognitive and cooperative communication has emerged as a powerful method for improving spectrum utilisation. In this study, an energy-augmented AF (EAF) protocol has been proposed to enhance the throughput and minimise the outage probability of cooperative cognitive relay networks. A power splitting based SWIPT relay secondary user in the EH module harvests the energy and uses the harvested energy to forward the amplified version of the signal to the destination. System model and analytical equations have been developed for the proposed EAF protocol. Simulation results demonstrate that the proposed EAF protocol outperforms the conventional schemes in terms of capacity, outage probability and throughput.

1 Introduction

In Energy Constrained Wireless Networks (ECWNs), devices have limited battery reserve leads to constrain the network lifetime. Replacing or recharging batteries incur high cost and inconvenience. To prolong the lifetime of ECWN, energy harvesting (EH) technique can be a feasible option [1–3]. Traditional EH technique adopts renewable energy sources such as solar, wind, geothermal and vibrations for harvesting energy. Recently, radio-frequency (RF) EH technique becomes one of a viable solutions for ECWN [4]. In [5] Varshney first proposed the idea of transmitting the information and energy simultaneously; since the RF signal can carry both energy and information simultaneously that gives rise to the simultaneous wireless information and power transfer (SWIPT) concept.

The receiver architecture design for SWIPT has been investigated in [6]. SWIPT in wireless cooperative networks has been studied in [7]. The analysis of wireless information and power transfer subject to co-channel interference has been conducted in [8]. Integration of SWIPT technologies in modern communication networks in the context of resource allocation and cooperative cognitive radio networks has been studied in [9]. The SWIPT concept for multi-user systems and the outage performance for SWIPT relaying systems in the presence of a direct link between the source and the destination have been investigated in [10, 11]. In [12] Grover and Sahai explained a non-trivial trade-off that exists between information transfer and energy transfer.

In [13] Ding *et al.* considered a cooperative wireless network in which multiple source–destination pair communicate with each other via an EH relay. Receiver architectures like time switching and power splitting (PS) for the amplify and forward (AF) relaying network have been considered by Nasir *et al.* in [14]. In [15] the time splitting and power-sharing based cooperative spectrum sharing protocol has been studied and it is inferred that the outage probability of the AF protocol is better than decode and forward (DF) protocol.

EH-based AF relaying protocol has been proposed in [16]. The EH efficiency outage performance of one-way AF EH relay aided underlay device-to-device communication has been investigated in [17]. The outage probability and the throughput of an AF relaying system using EH have been analysed in Chen [18]. In [19] an adaptive receiver architecture for EH and information processing has been proposed and an adaptive relaying protocol based on it has been developed for AF relaying system. AF cooperative communication with full-duplex (FD) operation has been analysed in [20].

SWIPT in multi-relay assisted two-hop cooperative communication for both AF and DF relaying strategies have been analysed in [21]. In [22] Tang *et al.* explore simultaneous information and energy transfer in fading relay channels where the relay has no fixed energy supply and replenishes energy from RF signals transmitted by the source. A SWIPT for a DF FD relay network has been analysed in Liu *et al.* [23]. In [24] both half-duplex (HD) and FD relaying mechanisms are studied with DF and AF relaying protocols over log-normal fading channels. In our work, the PS-based SWIPT technique and RF EH technique have been employed in the proposed energy-augmented AF (EAF) protocol to harvest energy and transmit information in cooperative wireless networks.

In this paper, PS-based SWIPT architecture has been developed for energy augmented AF protocol to enhance the throughput and minimise the outage probability of the cooperative cognitive relay network. The contributions of this paper are as follows:

- A system framework for the proposed EAF relay protocol is modelled.
- Capacity expressions have been derived for both primary and secondary networks employing EAF relay protocol.
- Further analytical equations have been developed for outage probability and throughput for the proposed EAF protocol.
- Comparative analysis between the EAF protocol and the conventional relay protocols have been examined with and without EH technique.
- Finally, simulation results show the performance advantages of EAF over conventional protocols in terms of capacity, outage probability and throughput.

The rest of this paper is organised as follows. Section 2 describes the proposed system model cooperative wireless relay network. Section 3 provides the analytical derivation of capacity, outage probability and throughput of proposed EAF protocol and conventional relay protocols. Section 4 presents the comparative analysis of proposed EAF with conventional protocols. Section 5 presents the results and discussion. Section 6 ends with the conclusion and future work.

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Energy-Efficient Power Allocation with Guaranteed QoS Under Imperfect Sensing for OFDM-Based Heterogeneous Cognitive Radio Networks

Cynthia Anbuselvi Thangaraj ✉ & T. Aruna

Wireless Personal Communications
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63 Accesses | Metrics

Abstract

This paper investigates the energy efficient resource allocation scheme for orthogonal frequency division multiplexing based heterogeneous cognitive radio network (HCRN) under imperfect spectrum sensing scenario with guaranteed quality of service (QoS). The objective of this paper is to maximize the energy efficiency (EE) of the HCRN subject to total transmission power, interference and QoS Constraints. To solve the mixed integer nonlinear programming problem efficiently, the primal problem has been transformed into a linear programming problem by separating the resource allocation scheme into two steps, i.e., subcarrier assignment and power allocation. Consequently an energy efficient power allocation (EEPA) algorithm has been anticipated

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Performance Analysis of Reduced Handoff Interruption Time and Energy Utilization in Cognitive Radio Networks by Unmanned Area Vehicle

M.Suresh Chinnathampy, T.Aruna, C.Amarsingh Feroz, S.Esakki Rajavel, S.Allwin Devaraj

Abstract : *The WiMAX (Worldwide Interoperability Microwave Access) is important in communication systems. Mobility is also important in WiMax to achieve high speed in data exchange over the medium. During the exchange of data handoff may be occurred.This paper is focused on handoff in WiMAX and MS (Mobile Station). The Handover Management Algorithm is used to avoid handoff in addition to improve the handover interruption time and to decrease the signaling transaction during the handover procedure we used Global Position System (GPS) to perform handoff faster. GPS has been introduced in this paper to find the position of the MS and BS then the MS will automatically choose BS by routing. We developed a new algorithm to improve the handoff interruption by introducing Time Division Multiple Access (TDMA).The MS finds its position using GPS and find the distance to the SBS (Source Base Station) and nearby BSs. In the next step,MS selects the target BS based on distance. Moreover we combine Handover Management Algorithm (HMA) with Cognitive radio networks (CRNs) for which are the way out for the trouble of underutilizing the license spectrum for which there are more needs in the final pair of decades. The congestion of the wireless spectrum has triggered a stringent contest for panic network resources.*

Keywords - WiMAX, TDMA, Handoff, GPS, UAV, CRN, HMA

I. INTRODUCTION

The concept between Hard Handoff and Soft Handoff are explained. In soft handoff the MS is connected to two BS of various types, soft handovers like FBSS (fast base station switching) and in hard handoff the connection is established for serving BS which is interrupted while the new base station gets into connection by Handoff Prioritization In general Frequency ranges 2-11 GHz for NLOS (Non-Line of Sight) and 10-66 GHz for LOS (Line Of Sight).In NOS transmission, the range extension is 8 km with speed up to 70 Mbps and in LOS transmission, the range is about 50 km. WiMAX range can be extended in wireless access up to 8000 square km of coverage. A WiMAX tower to tower connection are made using of microwave link called backhaul[5].

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Mr.M.Suresh Chinnathampy, Assistant Professor & Research center lab in Electronics and Communication Engineering of Francis Xavier Engineering College, Tirunelveli India.

Dr.T.Aruna, Assistant professor in Thiagarajar college of Engineering, Madurai India.

C.AmarsinghFeroz, Associate Professor in Electronics and Communication Engineering Department in Francis Xavier Engineering College, Tirunelveli, Tamilnadu, India.

Mr S.Esakki Rajavel, Assistant professor of ECE in Francis Xavier Engineering College. He completed his B.E/ECE in SCAD College

S.Allwin Devaraj, Assistant Professor & Research Centre lab in Francis Xavier Engineering College, Tirunelveli.

In NLOS, a small antenna on your computer is connected to tower, a fixed dish antenna points straight at the WiMAX tower from a apex [2] But in our algorithm distance is determined by MS using GPS. The departure is less than 2 meters In the next section HMA algorithm will be introduced. Since so many users shares the same channel there is a chance of occurring handoff delay so to avoid that we introduce TDMA in this method the users transmit information in every succession, one by one transmission / reception, everyone can use its own time slot[3]. In general WiMAX tower, covers up to 8,000 square km by a single tower. The distance between two towers can be 30 to 50 km. The HMA algorithm used in Femtocell which is a small cellular base station a low-power wireless AP (access point) designed for use in low level environment[4]. All MSs and BSs have a position. The MS position will be determined by GPS. The distance between MS and BSs are actually determined by MSs. The position of the MS can be determined in a period of time less than 60 ms, When the position of MS and all BSs are determined. Shadow fading will be occurred when there are physical obstacles (e.g. hills , towers , and buildings) between the BS and MS , which affects the received signal strength. Multipath fading occurs when two or more transmission paths exist between the BS and MS. According to the IEEE 802.16e standard, BS requests the report within 10 seconds by sending REP-REQ (report-request) message to all MSs and receives their responses by REP-RSP (report-response) or ACK (acknowledgement) message. In addition HMA and CRN are combined together by means of introducing UAVs to the system, UAVs or drone base stations (DBS) will help us to have signaling range to the place where no signal occurs.

II. RELATED WORKS

A. Handover Delay

The total time for the completion of handoff is based on the mobility of the mobile user. Moreover the handover process should be in a fast manner[1].

B. GPS system

The MN (Mobile Node) with GPS generates an AP (Access Point) map while it travels within a network. When MN enters into another network, it will download its GPS map from server. The MN gets the latitudes and longitudes by Basic Service Set ID (BSSID), AP's Service Set ID(SSID) and IPV6 are configured. By these AP and GPS map, we can locate the MN's position in a network and whether a MN moves or not. Finally GPS is used to calculate the distance.

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WiMax based Interference Reduction in Cognitive Radio Networks

Mr. M.SURESH CHINNATHAMPY M.E.,(PhD).,
Assistant Professor/ Electronics and Communication Engineering,
Francis Xavier Engineering College,
Tirunelveli-627003 India.
Email:sureshchinnathampy@gmail.com

Dr.T.ARUNA,
Assistant Professor/ Electronics and Communication Engineering,
Thiagarajar College of Engineering
Madurai-625015 India
Email:arunavelkennedy@gmail.com

***Abstract*— The Worldwide Interoperability Microwave Access (WiMax) is extensively used in communication systems. Mobility is well thought-out at this juncture in WiMAX to attain high data rate over medium. Handover is measured as essential issue in mobile WiMAX. During exchange of data handoff may be occurred. This paper focused on how to lessen handoff in WiMAX and MS (Mobile Station). We furthermore present a sub-optimal approach for solving distance calculation of mobile node over the space which reduces both on-line plus off-line complexity to the huge extent and to diminish signaling transaction for the period of handover practice we use Global Position System (GPS) in the direction of performing handoff more rapidly.**

Keywords*— *Cognitive Radio Networks ,WiMAX , GPS (Global Positioning System),SEM (Spectral Emission Mask),EVM ((Error Vector Magnitude) ,MCP (Mask Compliant Pre-coder)

I. INTRODUCTION

The notion stuck between Hard Handoff and Soft Handoff are explained. In soft handoff MS is correlated to two BS (Base Station) of a variety of types, soft handover like FBSS (Fast Base Station Switching) and hard handoff the relationship is well-known for serving BS which is interrupted while new base station gets into connection by Handoff Prioritization. In common frequency ranges 2-11 GHz (Giga Hertz) for NLOS (Non-Line of Sight) and 10-66 GHz for LOS (Line Of Sight).In NLOS transmission, the range extension is 8 km with speed up to 70 Mbps (Mega Bits Per Second) and in LOS transmission, the range is about 50 Km (Kilo Meter). WiMAX based on IEEE 802.16 set of standards its range can be extended in wireless access up to 8,000 square km of coverage. A WiMax provides multiple physical layer (PHY) and Media Access Control (MAC) options and WiMAX tower to tower connection are made using of microwave link called backhaul. In NLOS, a tiny antenna on your workstation is connected to tower, a dish points straight at the WiMAX tower from a apex But in our algorithm distance is determined by MS using GPS (Global Positioning System). It is introduced to locate the spot of the MS and BS (Base Station) which are running by spectrum management in CRN [2] (Cognitive Radio Networks) thus MS will manually choose BS by changing parameters involuntarily and routing. The MS finds its location by means of GPS to locate distance to the SBS (Source Base Station) and close by BSs (Base Stations) . The space between two towers can be 30 to 50 km. According to the IEEE 802.16e (Institute of Electrical and Electronics Engineers) standard BS requests report within 10 seconds by sending REP-REQ (Report-Request) to all MSs and receives responses by REP-RSP (Report-Response) or ACK (Acknowledgement). The whole time for completion of handoff is based on the mobility of mobile user. Moreover handover process should be in a fast manner. The MN (Mobile Node) with GPS generates an AP (Access Point) map while it travels within a network. When MN enters into another network, it will download its GPS map from server. The MN gets the latitudes and longitudes by BSSID (Basic Service Set ID), AP's, SSID (Service Set ID) and IPV6 (Internet Protocol Version 6) are configured. By these AP and GPS map, we can place MN's spot in a network and whether a MN moves or not. At last GPS is used to calculate the distance [4]. As an intellectual system with features such as awareness, and learning, CR(Cognitive Radio) represents future of wireless systems with guarantee of offering solutions to various communication problems. However with this new technology, raising interesting research topics. These challenges can be grouped into three categories. The first category includes the challenges that are unique to classical OFDM systems[7], sensitivity to frequency offset and phase noise. The second class includes problems faced by all CRs such as spectrum sensing, cross layer adaptation, and interference avoidance. Our main focus to reduce challenges that arise when OFDM technique is employed by CR systems. In subsequent step, we discuss major challenges to a practical system execution as well as some of the proposed approaches for solving challenges like M-OFDM (Multiband Orthogonal Frequency Division Multiplexing) systems, Location awareness, Signaling transmission parameters, Synchronization, Mutual interference. Multiband

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MACBHA: Modified Adaptive Cluster-Based Heuristic Approach with Co-operative Spectrum Sensing in Wireless Sensor Networks

S. Allwin Devaraj ✉ & T. Aruna

Wireless Personal Communications **114**, 69–84(2020)

40 Accesses | **1** Citations | Metrics

Abstract

In this paper, a Modified Adaptive Cluster-Based Heuristic Approach (MACHBA) has been proposed for wireless sensor networks (WSNs) to perform the cooperative spectrum sensing (CSS) in the shopping mall, weather forecasting, military area and audio, video transmission applications. A Secure CSS based MACBHA has been proposed for secondary spectrum usage. Unlicensed Secondary Users (SUs) utilize parts of the spectrum, which are not used by the licensed primary users (PUs) in cognitive radio WSNs. The unused spectrum of the PUs is utilized by the secondary user cluster. The performance of the MACBHA in WSNs is evaluated using the network simulator tool NS-2.35 in Ubuntu 16.04.6 LTS (Xenial Xerus) operating system. The simulation result shows the performance improvement in

AN ENERGY EFFICIENT ELEPHANT HERDING OPTIMIZATION BASED SPECTRUM SENSING METHOD FOR COGNITIVE RADIO SENSOR NETWORK

*1Mr.S.Esakki Rajavel, Assistant Professor,Department of ECE, Francis Xavier Engineering College,Tirunelveli
*2Dr.T.Aruna, Assistant Professor, Department of ECE, Thiagarajar College of Engineering, Madurai
*3 Ms.T.Sudalaivadivoo PG Scholar, Department of ECE, Francis Xavier Engineering College,Tirunelveli
*4 Ms Santhiya G,Saranya M, Sara Safreen M , UG Scholar, Department of ECE, Francis Xavier Engineering College,Tirunelveli

ABSTRACT:

Elephant Herding Optimization (EHO) is a metaheuristic swarm based search algorithm.which is used to solve various optimization problems.EHO can be used to solve services selection in QoS-Aware Web Service Composition, Energy based Localization.The algorithm is deducted from the behavior of elephant groups in the wild. Were elephants live in a clan with a leader matriarch (Female elephant),while the male elephants separate from the group when they reach adulthood.This is used in the algorithm in two parts.First, the clan updating mechanism.Second, the separation mechanism. Take into account the fact that the existing spectrum sensing algorithms are difficult to be applied to the real practice (due to the high cost of algorithm implementation or network deployment). It may lead to the waste of channel and energy resources, Elephant Herding optimization algorithm based energy-efficient spectrum sensing methodology is proposed in this project. MATLAB simulation results demonstrate that the proposed algorithm can greatly improve the energy utilization efficiency of spectrum sensing nodes and channel utilization and significantly reduce the deployment cost of network equipments.

I - INTRODUCTION

Cognitive radio proves the technical solution for the issuance of spectrum scarcity for wireless communication.They can successfully deal with the growing demand and scarcity of the wireless spectrum.The resource constraints of the batteries,heating effect of the devices and the increased emission of the greenhouse gases increases the urge to minimize the energy consumption of the cognitive radios. One of the main goals targeted with cognitive radio is to utilize the existing radio resources in the most efficient way. To ensure the optimum utilization, cognitive radio requires a number of conditions to be satisfied. The primary cognitive radio requirements are

(a) Negligible interference to licensed systems,
(b) Capability to adapt itself to various link qualities,
(c) Ability to sense and measure critical parameters about the environment, channel, etc.
(d) Ability to exploit variety of spectral opportunity,
(e) Flexible pulse shape and bandwidth,
(f) Adjustable data rate, adaptive transmit power, information security, and limited cost.

The aim of Cognitive Radio is usage of frequency bands that are owned by their licensed users. Therefore, one of the most significant requirements of cognitive radio is that the interference caused by cognitive devices to licensed users remains at a negligible level. One of the main features of the cognitive radio concept is that the targeted frequency spectrum is scanned periodically in order to check its availability for opportunistic usage. According to the results of this spectrum scan, the bands that will be utilized for cognitive communication are determined. Since at different times and locations the available bands can vary, cognitive radio is expected to have a high flexibility in determining the spectrum it occupies.

COOPERATIVE SPECTRUM SENSING AND ENERGY HARVESTING IN COGNITIVE RADIO NETWORKS

*1Mr.S.Esakki Rajavel, Assistant Professor,Department of ECE, Francis Xavier Engineering College,Tirunelveli
*2Dr.T.Aruna, Assistant Professor, Department of ECE, Thiagarajar College of Engineering, Madurai
*3 Ms Nancy Gnana Nivetha.R Preethi,S Priya Tharshini.S, , UG Scholar, Department of ECE, Francis Xavier Engineering College,Tirunelveli

ABSTRACT:

The performance of remote estimation over wireless channels is strongly affected by sensor data losses due to interference. Although the impact of interference can be alleviated by applying cognitive radio technique which features in spectrum sensing and transmitting data only on clear channels, the introduction of spectrum sensing incurs extra energy expenditure. In this project, we investigates cooperative spectrum sensing in cognitive radio networks (CRNs) with energy harvesting. Our goal is two-fold: first, to determine the optimal sensing parameters for effective management of the limited energy budget in order to maximize the spectral efficiency, and second, to exploit the benefits of a practical CRN towards improving the performance of the energy constrained CRN. Simulation results demonstrate that the proposed algorithm well balances the sensing energy and transmission energy expenditure and can achieve the desired estimation performance.

I - INTRODUCTION

At present, modeling & simulation is the only paradigm which allows the simulation of complex behavior in a given environment's cognitive radio networks. Network simulators like OPNET, NetSim, MATLAB and ns2 can be used to simulate a cognitive radio network. **CogNS** is an open-source NS2-based simulation framework for cognitive radio networks. Areas of research using network simulators include:

1. Spectrum sensing & incumbent detection
2. Spectrum allocation
3. Measurement and/or modeling of spectrum usage
4. Efficiency of spectrum utilization

Network Simulator 3 (ns-3) is also a viable option for simulating CR ns-3 can be also used to emulate and experiment CR networks with the aid from commodity hardware like Atheros WiFi devices

A **cognitive radio (CR)** is a radio that can be programmed and configured dynamically to use the best wireless channels in its vicinity to avoid user interference and congestion. Such a radio automatically detects available channels in wireless spectrum, then accordingly changes its transmission or reception parameters to allow more concurrent wireless communications in a given spectrum band at one location. This process is a form of dynamic spectrum management.

In response to the operator's commands, the cognitive engine is capable of configuring radio-system parameters. These parameters include "waveform, protocol, operating frequency, and networking". This functions as an autonomous unit in the communications environment, exchanging information about the environment with the networks it accesses and other cognitive radios (CRs). A CR "monitors its own performance continuously", in addition to "reading the radio's outputs"; it then uses this information to "determine the RF environment, channel conditions, link performance, etc.", and adjusts the "radio's settings to deliver the required quality of service subject to an appropriate combination of user requirements, operational limitations, and regulatory constraints".

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EA-MAC: A QoS Aware Emergency Adaptive MAC Protocol for Intelligent Scheduling of Packets in Smart Emergency Monitoring Applications

Asokan Jayaram and Sanjoy Deb

https://doi.org/10.1142/S0218126620502059 **Cited by:** 0

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Abstract

The evolution of the wireless sensor network (WSN) in recent years has reached its greatest heights and applications are increasing day by day, one such application is Smart Emergency Monitoring Systems (SMESs) which is in vision of implementation in every urban and rural areas. The implementation of WSN architecture in the Smart Monitoring Systems needs an intelligent scheduling mechanism that efficiently handles the high traffic load as well as the emergency traffic load without sacrificing the energy efficiency of the network. However, the traditional scheduling algorithms such as First Come First Served (FCFS), Round Robin, and Shortest Job First (SJF) cannot meet the requirements of high traffic load in SMESs. To address these shortcomings, this paper presents Emergency Adaptive Medium Access Control protocol (EA-MAC), a fuzzy priority scheduling based Quality-of-service (QoS)-aware medium access control (MAC) protocol for hierarchical WSNs. EA-MAC protocol employs the most powerful fuzzy logics to schedule the sensor nodes with both normal and emergency traffic load without any data congestion, and packet loss and maintaining the better QoS which is considered to be more important in SMESs applications. Moreover, a novel rank-based clustering mechanism in EA-MAC protocol prolongs the network lifetime by minimizing the distance between the Cluster Head (CH) and the Base Station (BS). Both analytical and simulation models demonstrate the superiority of the EA-MAC protocol in terms of energy consumption, transmission delay and data throughput when compared with the existing Time Division Multiple Access

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WIRELESS V2V COMMUNICATIONS OF UNMANNED VEHICLES WITH WIRELESS NETWORK TRACKING AND EMP CHARGER OF TESLA COIL

[1] M.SUDHA, [2] P.SANTHOSH, [3] R.SIVA PRAKASH, [4] M.SURIYA,

[1] Assistant Professor, Department of Electrical and Communications Engineering,

Paavai Engineering College, Namakkal

[2,3,4] UG Scholar, Department of Electrical and Communications Engineering,

Paavai Engineering College, Namakkal

ABSTRACT

Wireless communication systems that include unmanned vehicles promise to provide cost effective wireless connectivity for devices without infrastructure coverage Compared to terrestrial communications on high altitude platforms on demand wireless systems with low altitude UVs are in general faster deploy and more flexibly reconfigured, likely to have better communication channels due to the presence short range line of sight links However the utilization of highly mobile , energy constrained UVs for wireless communications also introduces new challenges. In Vehicle collision avoidance system is automobile system a safety system that is designed to reduce the chances of collision to achieve this we use V2V communication and vehicle to infrastructure communication used to minimize the chances of the accidents In addition to this, for an Electric unmanned vehicle we use Wireless charging to charge the vehicle with the help of Tesla coil. In this article, we provide an overview of Unmanned/ Autonomous Electric Vehicle aided wireless communications introducing the basic networking architecture and main channel characteristics highlighting the key design considerations as well as the new opportunities to be exploited.

1. INTRODUCTION\

With their high mobility and low cost, unmanned vehicles have found a wide range of applications in the past few decades .UV's such as car,having limited mobility and payload, are able to move in any direction as well as to stay stationary in the road. Among the various applications enabled by UVs, the use of UVs for achieving high speed wireless communications is expected to play an important role in future communication system. Adaptive communications can be jointly designed with UV Mobility control to further improve the communication performance. For example, when a UV experiences good channels with ground terminals, decides transmitting at higher rate, it can also lower its speed to sustain good wireless connectivity to transmit more data to the ground terminals.

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Diamond and Related Materials

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Design and fabrication of clad modified fiber optic gas sensor based CeO_2/MWCNTs hybrid sensors by facile hydrothermal technique

S. Vijayakumar [a], S. Vadivel [b], A. Biruntha [a], T. Brindhasri [a], P.A. Desika [a]

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Highlights

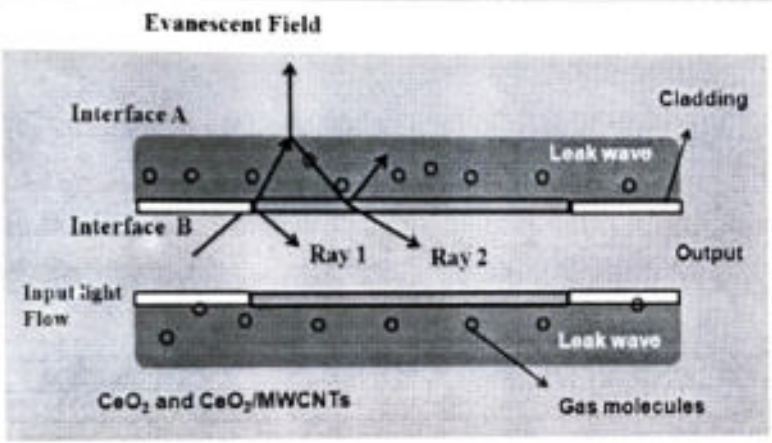
- A facile hydrothermal route to synthesis of CeO_2/MWCNT hybrid sensors
- CeO_2/MWCNTs show high sensitivity (75×10^{-3} k/Pa), rapid response (26 s) and recovery time (35 s).
- This is due to high surface area porous nature of the CeO_2/MWCNTs hybrid sensors.

Abstract

FEEDBACK

In this report, a novel CeO_2/MWCNTs nanocomposite was synthesized using a simple hydrothermal method and examined structural, morphological and elemental composition using powder X-ray diffraction, transmission of electron microscopy, dispersive energy spectra, and N_2 adsorption-desorption analysis. The XRD and TEM findings indicate that both pure nanocomposite and CeO_2/MWCNTs exhibit cubic structure and CeO_2 nanoparticles (30–60 nm in diameter) are distributed uniformly on the surface of MWCNTs. The gas sensing properties of the as synthesized composites were tested using fiber optic clad modified method at room temperature with ethanol and ammonia gases. The results showed that nanocomposite CeO_2/MWCNTs demonstrated high sensitivity (75×10^{-3} k/Pa), rapid response (26 s) and recovery time (35 s). The newly prepared sensor CeO_2/MWCNTs opens up exciting perspectives for nanosized sensor devices to develop. The possible mechanism for gas sensing has also been discussed in detail.

Graphical abstract



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Keywords

CeO_2/MWCNTs; Hydrothermal; Chemical sensors; Fiber optic; Ethanol gas; High sensitivity

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FEEDBACK

May-June 2020
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Energy Management using Li-Ion Battery for Solar and Savonius Rotor Hybrid Energy System

S. Suganya*, M.E., Assistant Professor/EEE, Paavai Engineering College, Namakkal (Dt), TamilNadu, India.
Dr.G. Balaji, M.E., Ph.D, Professor and Head/EEE, , Paavai Engineering College, Namakkal (Dt), TamilNadu, India.
R.Ajith Kumar, S.Dinakaran, N.Jayasurya, K.Mageswaran ,
UG Student/EEE, Paavai Engineering College, Namakkal (Dt), TamilNadu,India.

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Abstract:
The demand for oil concentrated the supply of stable fuels which was uncovered by a petroleum crisis. Improvement of healthier sources of elective energy is renewable and has negligible ecological impact. The alternate fuels, the hybrid system's electrical energy is generally considered a more valuable renewable energy source because it is clean, plentiful and dispersed across the globe. Given the individualities of atmospheric reflection and absorption of photons, it is estimated that the event of solar radiation on the Earth's atmosphere is ten thousand times higher than the world's energy consumption. Reducing carbon dioxide emissions is a major benefit of the hybrid system. These approaches are accurate, fast and effective. Because of its benefits, such as the absence of fuel costs, low maintenance requirements and environmental friendliness, the hybrid system has become increasingly important as a renewable source. Such methods differ in complexity, mandatory sensors, combining speed, cost and performance rate. Hybrid Systems has the most capacity to meet our demands for electricity. Solar energy occurs during the day, but periods of solar irradiation differ due to the strength of the sun and the irregular shades produced by clouds, birds, plants, etc. Similarly, wind energy is capable of providing substantial electricity. Yet, its appearance is somewhat unpredictable, because one moment it may be here and in another it has gone in. The common inherent drawback of the hybrid system is the erratic natures which render it unreliable. This system requires the suppliers to supply the charge individually or automatically, depending on the efficiency of the sources of electricity. The integrated device energy analyzes are made for Li-ion batteries.

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Keywords: *Induction Generator, Inverter, Microcontroller, Rectifier ,Relay, Solar Panel, Wind Turbine*

1. INTRODUCTION

Conventional sources of electricity are flawed and they pollute the atmosphere. Therefore, the use of alternative energy sources such as solar energy, tidal energy, wind energy, fuel cell, etc. has been given further attention. Wind Energy is among them the most growing and most auspicious form of renewable energy, as economically feasible. In this paper a hybrid system[1] of solar panel and rotor wind turbine model savonius [6] is proposed.Li-on battery is employed for storage purpose to examine the performance of overall system. The simplified block diagram shown in figure 1, consists of PIC Microcontroller, Relay driver, Converter and Inverter section to supply for both DC and AC loads. MATLAB Simulink is used to analyze the simulation results.

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Design and Development of Breath Acetone Based Non-Invasive Blood Glucose Level Monitoring System

B. Murali Babu[1], P. Parameshwaran[2], B. Prabakaran[2], D. Rajarajan[2], S. Saravanan[2]

[1] *Professor, Paavai Engineering College, Namakkal, India.*
[2] *Research Scholars, Paavai Engineering College, Namakkal, India.*

Abstract

Diabetes has become one of the most persistent diseases with high diagnosis cost. The constant monitoring of blood glucose level is necessary for maintaining the health of the patients and to take preemptive measures before the onset of any other complications. The current invasive clinical techniques for monitoring blood glucose may lead to spreading of contagious disease. With the modernized world of embedded controllers and biomedical equipment, medical problems could be solved which may enhance the quality of life. Recent research has proven acetone as a biomarker for diabetes which has a strong correlation towards blood glucose. Thus, a reliable, instantaneous and non-invasive IoT based breath analyzer has been developed. TGS822 gas sensor which has sensitivity towards acetone was used for the measurement of acetone concentration in breath and glucose levels are uploaded to the cloud.

Keywords: *Diabetes, Acetone, Embedded controllers, TGS822 sensor, Cloud storage.*

1. Introduction

Diabetes also known as Diabetes mellitus is one of the leading causes of death these days, affecting 8.7 percent of the global population including people of all age categories. Diabetes occurs throughout the world but is more common (especially type-2) in developed countries [1]. Globally, 422 million adults are estimated to live with diabetes, according to the latest data from the World Health Organization (WHO) [2]. The WHO estimated that diabetes resulted in 1.7 million deaths in 2018, making it the 8th leading cause of death. Until recently, India had more diabetic patients than any other country in the world, according to the International Diabetes Foundation, although the country has now been surpassed in the top spot by China. It was analyzed that nearly 1 million Indians die due to diabetes every year. According to the Indian Heart Association, India is projected to be home to 109 million individuals with diabetes by 2035 [3]. Thus, a strong statement could be made that diabetes is going to be a global disease. As a consequence of genetic disorder there is a possibility for the transfer of diabetes from the parents to their offspring. It is a chronic disease where the patients do not have any symptoms unless they are experiencing hyperglycemia or hypoglycemia [4].

2. Diabetes and its types

Diabetes is the condition in which the body does not properly process food to gain energy. Blood glucose level below 140 mg/dL is usually considered a normal sugar level. A reading between 140 mg/dL to 199 mg/dL is indicated as prediabetes. The pancreas, an organ that lies near the stomach, secretes a hormone called insulin to help glucose get into every cell of the body. Diabetes could be classified into two types as Type-1 diabetes and

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SMART FARMING SYSTEM

DR.G.BALAJI[1],S.RATHINAVEL[2] ,N.ANAND[3], D.ARAVIND[4],A.JAVITH[5], M.HAMSAVALLI[6]

[1]Professor,[2] Assistant professor,[3,4,5] UG students
Department of Electrical and Electronics Engineering,
[1] Paavai Engineering Collage,Nammakal,India.

Abstract: In our system Motor is connected with DOL starter it contains on /off push button to start and stop the motor, GSM control circuit is connected to the DOL starter for control the motor turn on/off operation through the GSM control. There are three lands for the irrigation purpose that timer is giving the input signals to solenoid valve for only the time which required irrigating the land and that moisture sensor checks the lands moisture level and gives the signal to the timer.In our system the man work for irrigation is eliminated & loss of water during irrigation is avoided by our system, this system provide unimaginable benefit to farmer in the field without require huge man work. The smart farming system developed by our team is adaptive plants and crops irrigation. This purpose of our smart farming system are to provide a water delivering schedule to the crop to ensure all the crop having enough water for their healthy growth, to reduce the amount of water wasted in irrigation, this system able to make decision for the user when distribute water into field.

Keywords: GSM, Solenoid valve, Sensor, Timer, DOL Starter

I INTRODUCTION

Smart farming system is extremely new & sophisticated, which will aid in the growth of agriculture yield by applying hi-tech agriculture technique without human intervention. There are lot of new innovation have the potential to create a impact on the green revolution. In droughty California nowadays utilizing smart irrigation system not only for the environment sustainability but also for the lower expense of water usage in the field.In olden days farmers used to figure the ripeness of soil and influenced suspicious to develop which kind of yield .they don't think about the humidity, level of water & especially climate condition

1.1 Importance of irrigation

In the next 35 to 45 years world food production will got to double to satisfy the stress of increased population. Ninety percent of this increased food production will need to come from existing lands & seventy percent of this increased food production will need to come from irrigated land. Without irrigation farming is extremely limited & if the rainfall decreases to but 30cm, agriculture becomes impossible without irrigation (King, 1953). It increases crop yield. It protects from famine. It helps to cultivate superior crops with the water system as per need of the crops. Ultimately it helps in economic development. Irrigation water improves water conditions within the soil, increases the water content of plant fibers, dissolves nutrients & makes them available to plants. Irrigation affects temperature conditions by regulating the temperature of the surface layer of the soil & the bottom layer of the air & also makes possible control of the expansion & development of plants & improvement of the standard of the harvest. In fruit & berry crops that receive optimum quantities of moisture, the sugar content of the fruit increases & in oil crops the fat content within the seeds is bigger . For rice & wheat) with supplementary nitrogen feeding), the protein content within the grain increases & for cotton the standard of the fiber is improved

1.2 Present Status of Irrigation

I In the middle of 20th century, the arrival of diesel & electric motors led for the primary time to device that might pump groundwater out of principal aquifers quicker than it have been recharged. this can motive permanent lack of aquifer capacity, reduced water quality, ground subsidence & different problems. The longer term of food production in such regions because the North China Plain, the Punjab & the coolest Plains folks is threatened. At the global scale 27,88,000 sq. Km. Of agricultural land turned into geared up with irrigation on the present , which became 19,31,000 sq. Km. In 1980. About 70% of the world ready for irrigation is determined in Asia which was 68% in 1980. 9% of the world geared up for irrigation in Europe, which changed into 7% in 1980. In Africa it were 5% both in 2003 & 1980. In America the world ready for irrigation become 15% in 2003 & 18% in 1980. In Oceania it had been 1% in 2003 & 0.9% in 1980. The most important contiguous areas of excessive irrigation density are observed in North India & Pakistan alongside the rivers Ganges & Indus,

SMART TROLLEY FOR SHOPPING MALL

R.Priyanka [1*], M.Hariprasath[2*], M.Gowtham [3*], M.Hariharan[4*], V.Kavin[5*]

[1] Assistant Professor, Dept.of EEE, Paavai Engineering College, Namakkal

[2] Undergraduate Students, Dept.of EEE, Paavai Engineering College,Namakkal

[3] Undergraduate Students, Dept.of EEE, Paavai Engineering College, Namakkal

[4] Undergraduate Students, Dept.of EEE, Paavai Engineering College,Namakkal

ABSTRACT

In today's life going to supermarkets for shopping is increasing rapidly. People take the item and put it into trolley. After done with shopping they go for billing at the Billing counter but as there are many people standing in Queue for billing purpose, So lots of time is required for the individuals for billing because of existing barcode technology. To reduce this time we are proposed a system based on RFID technology. The system contains the items attached with RFID tag, RFID reader which reads the tag information when put into the trolley. Load cell calculate the weight of purchased product. Then this information is send to main billing server which calculates the total amount of purchased items and sends the calculated bill to the device attached to trolley for displaying it on LCD. Along with this system we are implementing an Web application for monitoring the trolley. The application is based on the Trolley number and total amount of purchased items.

KeyWords : Barcode, Tags & Shopping Malls

INTRODUCTION

Individuals have constantly created innovation to bolster their requirements as from the start of humankind. The fundamental reason for development in innovation is ought for more independency and this leads to improving tasks and making regular one simpler and speedier. One significant task that individuals invest maximum measure of energy is in shopping. Shopping center is a spot where individuals get their every day necessities running from sustenance items, garments, electrical machines and so forth. Some of the time clients have issues with respect to the unspecific data about the item marked down and misuse of superfluous time at the counters. In this innovative world, each grocery store and supermarkets utilize shopping trolleys with a specific end goal to help clients to choose and store the items which they expect to buy. Customers usually purchase the products required and place them in their carts and thereafter wait at the counters for payments of bills. The payment of bills at the counters is really troublesome and time consuming process which thereby increasing a heavy crowd at the counters. As indicated by a study directed by US Department agency , on a normal, people spend through 1.4 hours consistently on shopping. A considerable number of clients will tend to leave a line if the line is too long. The present Shopping environment can be essentially be characterized into two classifications

(1) Shopping in-individual

(2) Shopping in absentia.

SOLAR POWER SYSTEM USING BSCA BASED MPPT FOR ON AND OFF GRID

R. Johnnie Hepziba[1], P. Ayyanar[2], G. Dineshkannan[3], T. Gokulnath[4], M. Hariprasath[5]
[1]Assistant Professor, [2,3,4,5]UG Students
Department of Electrical and Electronics Engineering,
Paavai Engineering College, Namakkal, India.

ABSTRACT: In this paper, a novel photovoltaic (PV) maximum power point tracking (MPPT) based on biological swarm chasing behavior is proposed to increase the MPPT performance for a module-integrated PV power system. Each PV module is viewed as a particle, and as a result, the maximum power point is viewed as the moving target. Thus, every PV module can chase the maximum power point (MPP) automatically. A 525W prototype constructed by three parallel-connected 175 W PV modules is implemented to assess the MPPT performance. Comparing with a typical perturb and observe (P&O) MPPT method, the MPPT efficiency η-MPPT is improved about 12.19% in transient state by the proposed MPPT as theoretical prediction.

Keywords: Maximum Power Point Tracking, Biological Swarm Chasing Algorithm, Pulse Width Modulation, Buck-Boost DC-DC Converter, Nine-level Inverter.

1. INTRODUCTION

The global energy consumption is increasing everyday due to increased population and advanced technologies. But due to unreliable electrical system, our country is facing severe power shortage problems. India and China are the two countries responsible for major consumption of energy. Due to Global warming concerns, there is a strong need to deploy clean energy sources and implement energy efficient solutions to meet future energy demand. Energy engineers all over the world are focusing on solar projects to increase the generation capacity. A solar system is made up of solar modules. Number of cells combines to form a module and these modules are in turn connected to form the PV system. The output DC voltage of the panel is then converted to desirable AC voltage for feeding excess power to the grid. Despite of advanced technologies, a grid connected PV system is always subjected to several complexities. Maximum Power Tracking algorithms were developed in past methodologies to obtain continuous constant power. Comparison of various conventional MPPT algorithms. Soft computing-based algorithms were recently developed to obtain the global optimal solution under varying environmental conditions. The BSC method is a simple and effective meta heuristic approach for obtaining optimal solution. It requires assignment of random weights and velocity vector. The proposed Biological Swarm Chasing algorithm (BSC) is a swarm behavior-based technique and is relatively easier to develop.

The proposed work concentrates on designing DC-DC converter operated through the MPPT algorithm and a nine-level inverter to obtain AC supply.

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Energy Management using Li-Ion Battery for Solar and Savonius Rotor Hybrid Energy System

S. Suganya*, M.E., Assistant Professor/EEE, Paavai Engineering College, Namakkal (Dt), TamilNadu, India.
Dr.G. Balaji, M.E., Ph.D, Professor and Head/EEE, , Paavai Engineering College, Namakkal (Dt), TamilNadu, India.
R.Ajith Kumar, S.Dinakaran, N.Jayasurya, K.Mageswaran ,
UG Student/EEE, Paavai Engineering College, Namakkal (Dt), TamilNadu,India.

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Abstract:
The demand for oil concentrated the supply of stable fuels which was uncovered by a petroleum crisis. Improvement of healthier sources of elective energy is renewable and has negligible ecological impact. The alternate fuels, the hybrid system's electrical energy is generally considered a more valuable renewable energy source because it is clean, plentiful and dispersed across the globe. Given the individualities of atmospheric reflection and absorption of photons, it is estimated that the event of solar radiation on the Earth's atmosphere is ten thousand times higher than the world's energy consumption. Reducing carbon dioxide emissions is a major benefit of the hybrid system. These approaches are accurate, fast and effective. Because of its benefits, such as the absence of fuel costs, low maintenance requirements and environmental friendliness, the hybrid system has become increasingly important as a renewable source. Such methods differ in complexity, mandatory sensors, combining speed, cost and performance rate. Hybrid Systems has the most capacity to meet our demands for electricity. Solar energy occurs during the day, but periods of solar irradiation differ due to the strength of the sun and the irregular shades produced by clouds, birds, plants, etc. Similarly, wind energy is capable of providing substantial electricity. Yet, its appearance is somewhat unpredictable, because one moment it may be here and in another it has gone in. The common inherent drawback of the hybrid system is the erratic natures which render it unreliable. This system requires the suppliers to supply the charge individually or automatically, depending on the efficiency of the sources of electricity. The integrated device energy analyzes are made for Li-ion batteries.

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1. INTRODUCTION

Conventional sources of electricity are flawed and they pollute the atmosphere. Therefore, the use of alternative energy sources such as solar energy, tidal energy, wind energy, fuel cell, etc. has been given further attention. Wind Energy is among them the most growing and most auspicious form of renewable energy, as economically feasible. In this paper a hybrid system[1] of solar panel and rotor wind turbine model savonius [6] is proposed.Li-on battery is employed for storage purpose to examine the performance of overall system. The simplified block diagram shown in figure 1, consists of PIC Microcontroller, Relay driver, Converter and Inverter section to supply for both DC and AC loads. MATLAB Simulink is used to analyze the simulation results.

SMART E-VEHICLE CHARGING SYSTEM USING RFID

A. Ajithkumar[1], M. Ajithkumar[2], S. Gopi[3], V.G. Balajisabarinathan[4], Mr. C. Gowrishankar[5]

1,2,3,4, UG Students, 5 Assistant Professor,

Department of Electrical and Electronics Engineering, Paavai Engg. College, Namakkal, India.

Abstract

With an increased number of Electric Vehicles (EVs) on the roads, charging infrastructure is gaining an ever-more important role in simultaneously meeting the needs of the local distribution grid and of EV users. This paper proposed system RFID system for user identification and charging authorization as part of a smart charging infrastructure providing charge monitoring and control. The RFID provides a cost-efficient solution to identify and authorize vehicles for charging and would allow EV charging to be conducted effectively while observing grid constraints and meeting the needs of EV drivers. The vehicle charging is based on voltage level. In this system we can monitor our charging level through the server at any where any time using IOT.

1. Introduction

As the number of EVs on the road's increases, charging stations in both parking structures and private garages will become more prevalent. These stations will be responsible for meeting the requirements of the distribution grid, EV owners, and parking structure operators. For security and financial reasons, among the many functions these charging stations will perform are user authorization, authentication, and billing. Other commercial charging stations, such as Coulomb and Blink require a short-range RFID card for the same purpose.

In both cases, extra steps on the part of the user must be taken to authorize charging. The authors in propose using conventional RFID tags inside EVs and RFID readers on parking garage access gates together with middleware and an aggregate charging controller to authorize, assign, and enable charging. However, this system still requires action from the user and is not as flexible as may be desired. The proposed improvements allow charging authorization to take place seamlessly at multiple charging stations in a single geographic location without any action on the part of the user. Vehicle Monitoring/Identification Modules (VMMs), located in EVs, act as RFID tags for vehicle identification and charging authorization.

The Internet of Things, also called things-linked internet, it refers to a kind of network that adopts RFID (radio frequency identification) and to enable the linkage between any articles and the internet, to enable the exchange and communication of information.

This paper aims to discuss the application of RFID technology in the battery charging stations, and analyse the technical advantages of RFID technology in the electric vehicle identification as well as the unified management of the battery charging compartment. Here for the output power supply SMPS (switching mode power supply) is used

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WIRELESS SCROLLING MESSAGE AND VIDEO LED DISPLAY

R.Manimaran[1], R.Haribaskar[2], K.Gowtham[3], M.Gopalsamy[4]

Guided by, S.Manikandan, M.E[5],

[5]Assistant Professor, Department of Electrical and Electronic Engineering, Paavai Engineering College, Namakkal, India

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ABSTRACT: The display development is driven by the increasing need to present information and graphics to larger audiences in more temporary and flexible formats. The need for portability, fast setup, easy reconfiguration and multiple uses has driven the need for light, efficient, easily erected, high quality displays. Through collaboration with multiple industry representatives, the display was designed to meet expectations of visual quality, portability, and display management, influenced by the LED arrangement, power efficiency, thermal regulation and physical construction. Notice Board is primary thing in any institution / organization or public utility places like bus stations, railway stations and parks. But sticking various notices day-to-day is a difficult process. A separate person is required to take care of this notice display.

This project deals about an advanced hi-tech wireless notice board. The overall software interface is simple, powerful, easy to learn and use. The project is built around the P6 LED module. This acts as a controller and Wi-Fi module provides all the functionality of the display. Display is obtained on LED Matrix Display Array on a printed circuit board. The scrolling speed text can also be changed according to user requirement using a mobile. This can be done using Wi-Fi wireless communication.

The key outcomes of this prototype include an operational, full scale prototype display, which implements large LED display colour aliasing, a purely passive thermal management solution, a rapid deployment system, and LED current control with two way display communication, auto-configuration and complete signal redundancy.

1. INTRODUCTION

The led Display System is used at the colleges and universities for displaying day to - day information continuously or at regular intervals during the working hours. Being WI-FI- based system, it offers flexibility to display flash news or announcements faster than the programmable system. WI-FI- based display system can also be used at other public places like schools, hospitals, railway stations, gardens etc. It presents an SMS based display board incorporating the widely used WI-FI to facilitate the communication of displaying message on display board via user's mobile phone from any circumference within WI-FI. It receives the SMS, validates the sending Mobile Identification Number(MIN) and displays the desired information after necessary code conversion. Thesystem is easy, robust, to use in normal life by anyone at anyplace with less errors and maintenance. As engineer's main aim is to make life simple with help of technology, this is one step to simplify real time noticing.

Notice Board is Primary Thing In Any Institution Or Organization Or Public Utility Place Like Bus, Railway Station and Park. Sticking Various Notices Day-To-Day Is A Difficult Process. A Separate Person Is Required To Take Care Of This Notices Display. This Project Deal about an Advance Hi-Tech Wireless Notice Board. The Project Is Built Around A Micro Controller Which Provide All The Functionality Of The Display And Wireless Control. Display Is Obtained On Led. The Advantages of This Project Being Low Coast and Low Power Consumption

EXITING SYSTEM

The LED Display System is used at the colleges and universities for displaying day to - day information continuously or at regular intervals during the working,

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SMART CLASS BASED ON FINGER PRINT ATTENDANCE SYSTEM AND SMART TV

T.Nandagopal[1], D.Divyabharathi[2], M.Hemamalini[3], N.Jananey[4], S.Kiruba[5]

[1]Assistant Professor, Department of Electrical and Electronics Engg, Paavai Engg. College, Namakkal, India
[2] UG Student, Department of Electrical and Electronics Engg, Paavai Engg. College, Namakkal, India
[3]UG Student, Department of Electrical and Electronics Engg, Paavai Engg. College, Namakkal, India
[4]UG Student, Department of Electrical and Electronics Engg, Paavai Engg. College, Namakkal, India
[5]UG Student, Department of Electrical and Electronics Engg, Paavai Engg. College, Namakkal, India

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Abstract - *Fingerprint attendance system aims the automated attendance procedure of an educational institution using biometric technology. It allows the monitoring of student attendance to class is a true electronically by using biometric recognition. It can reduce the fraudulent students who are mostly making their fake presence. It is more secure to use and unique for every person which does not change in one's lifetime. Identifying an individual from a set of fingerprints is a time taking process. Smart class is a digital initiative which is rapidly transforming the way teacher teach and student learn. Smart class as a modernized method provides the quality education to student. Without use of CPU, processor or computer, it requires only a pen drive is plugged to a smart TV. Smart TV is used for Bluetooth, WI-FI connection, casting, audio system and network connection. The uniqueness of the fingerprint supported by technology can automatically identify or recognize a person using fingerprint sensor. The existing fingerprint sensor can only do fingerprint identification on one machine. For the mentioned reason we need a method to be able to recognize each user in a same fingerprint sensor with high accuracy. The purpose of this research is to build fingerprint sensor system for fingerprint data management to be centralized so that identification can be done in short interval of time. The result of this research shows that by using Arduino and Raspberry Pi, data processing can be centralized so that fingerprint identification can be done in fingerprint sensor with 98.5% success rate of centralized cloud storage recording. Human beings have something unique that only belongs to them.*

***Key Words*: Fingerprint sensor, smart TV, cloud storage, Arduino, data management.**

1. INTRODUCTION

Classroom is a space for teaching and learning. A general a classroom usually has a black board, a lecture, tables and chairs. To make a classroom activity more efficient, educational institutes have been continuously developing electronic products such as microphones, projector, video camera and a computer into classroom during the last few decades. The next step for educational institutes is to enhance the functionality of a classroom. Conventional attendance system followed in an educational system where the teacher calls out the name of each student and marks the attendance causes the time wastage during lecture time. This becomes more severe especially in current scenario where number of students in a class is very large. Managing the attendance data such as large group is also very difficult also it has chance of a student to make fake attendance. Fingerprint devices use computer to store and verify fingerprints in corporate environments. It can be ported to academic environments with modifications. The entitled student attendance monitoring system is to update student's attendance automatically and sent to the HOD of the corresponding department, it will display the class faculty lecturing the classroom and send the alert message to the corresponding faculty member. The students entering the classroom place their finger on the biometric sensor. The digital output from sensor received by Arduino controller compares with digital data of various students already registered. If any mismatch occurs, it gives invalid finger else the data is stored. When the entire student thumb is received then we switch on a button on biometric system.

2. EXISTING SYSTEMS

2.1 RFID system

The website is a social networking site that, records various information about each action performed by its members or users. This technique is a popular wireless identification technique for monitoring attendance. So this system can save time than manually charging the absent and more appropriate attendance allocation of score. Automated information systems play a role in a growth, progress and modernization of daily work process and with attendance performance graphs delineate consistency with student attendance. Research says that one of the attendance systems of students based on the radio frequency technology is Radio Frequency Identification (RFID) which aims to monitor student progress. Also, RFID-based attendance could make the process simple, provide a well- structured report and can analyze student attendance pattern and time management so that resource allocation in the organization can be maximally utilized.

HYBRID ELECTRIC BIKE USING SUPER CAPACITOR

[1]C.Arulkumar,M.E., [2] S.Jeeva, [3]M.Kaviyarasan,[4]G.Manoharan,[5]R.Gokulraj

[1]Assistant Professor, [2,3,4,5] UG Students, [1,2,3,4,5]Department of Electrical and Electronics Engineering,

[1,2,3,4,5] Paavai Engineering College, Namakkal, India

ABSTRACT-

Different brands of Electric bikes are available in the market at present. In almost all Electric bikes a rear wheel with hub motor, lead acid battery pack, a light weight chassis, and a controller is placed which is very long and lifespan of batteries is short i.e. around years. Considering these limitations in this, we are giving solutions to modify the existing design to give a better performance. Super capacitor modules help to increase the lifespan of battery. Regenerative braking or a small control module could be availed onboard so as to charge battery of modules and super capacitors, pedal system in electric bike also saves lot of battery power. The electric bikes which are available and area affordable incorporates a rear wheel Hub motor which is suitable and compact. The battery pack is a series combination of cells, a controller Batteries are generally lead acid which are cheaper compared with other types. A potentiometer box is present which acts as accelerator along with other minor circuitry and accessories.

Keywords : Super capacitor, Battery, Choke, Speed Controller & Toggle Switch

1.INTRODUCTION

Vehicles have been shaping human civilization for centuries and expanding their horizons beyond a few localized communities and automobiles are the most modern form of this vehicle transportation. The increasing usage of conventional automobiles is causing harm to the environment and human life, as these automobiles burn petrol, diesel or natural gas and produce carbon dioxide sulfur dioxide and oxides of nitrogen as harmful exhaust components. In the EU, the transportation sector is accountable for approximately a quarter of greenhouse gas (GHG) emissions. While GHG emissions from other sources where decreasing by GHG in order to overcome the charging and the range limitation problem, the company Better Place is proposing to quickly exchange the vehicle battery in exchange stations. In total more batteries are necessary since besides the batteries in A motorcycle engine is an engine that powers a motorcycle. Motorcycle engines are typically two-stroke internal combustion engines. The other engine types such as wankels and electric motors have been used. although some mopeds such as velosolex, had friction drive to the front tire where the motorcycle engine normally drives the rear wheel and the power being sent to the driven wheel is done by belt, chain or shaft. Larger capacities have become common, In existing system we have used to charge battery only and then utilize the power of battery. vehicles also batteries in the exchange stations, which are recharged during the vehicle batteries are used for driving short recharging process. Battery technologies based on in a novel strategy by introducing a splitting of the input voltages as for example shown in figure is proposed. The reduced operating voltage enables to use MOSFETs with a lower blocking voltage. This results in a reduction of the conduction and switching losses, so that the power density could be increased.

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Smart Class Automation

K. Jagatheesan[1], P. Divya[2], A. Hasna Fathima[3], J. Jayabarathi[4], V. Madhumitha[5*]
[1]*Assistant Professor, Department of Electrical and Electronics Engineering, Paavai Engineering College, Namakkal, India*
[2,3,4,5]*UG Student, Department of Electrical and Electronics Engineering, Paavai Engineering College, Namakkal, India*
*Corresponding author: sarovijayan27@gmail.com

***Abstract*: Today's world day automation is very much essential. Smart classroom is the representative of modern teaching. Now-a-days a smart fan and light is very much essential to the concept of "smart class". When it is hot, using a fan which is less expensive than compared to air conditioner. When an individual forgets to turn off the fan and light, it leads to the waste of electricity. So, they move on to automation. Most of the previous research paper explained that IR and PIR sensors act as the sensing sensors. The performance of IR sensor has poor tolerance to light reflection such as bright light object. The passive infrared sensor (PIR) has the drawback of temperature limit. So, in this project we have used ultrasonic sensor. The main advantage of ultrasonic sensors is that it does not have any range or zone like a PIR sensor. It is used to measure the distance between the human and predefined set point. The microcontroller and ultrasonic transducer HC-SR05 forms the basis of the circuit. The ultrasonic module sends signal to the object and pick up its echo and output a wave form processing and varies the intensity of the fan. Here these sensors are fixed in the overhead ceiling fan. These sensors can sense up to 360-degree circumference beneath the fan and a thermostat is used to maintain the temperature in the room. This paper also describes about the remote controller fan on pressing the OPEN and CLOSE switch.**

***Keywords*: HC-SR04, MLS, PIR, Smart fan.**

1. Introduction

The classroom automation system is developed by the automatic switching of light and fan. Our country has developed in different season. The temperature will be above 40 degree Celsius in most regions during summer. It becomes very uncomfortable to live without a fan. In fact, a fan plays a major role in our households. For many people fan is the standard way of cooling down. Sometimes the individuals forget to turn off the light when they are out and this leads to wastage of electricity. Thus, we have decided to initiate a system that could save the electricity by automatic switching on and off the fan and light. Here this section had a glance on its previous researches [1] Adelakun, Adebiyi A., et al., automatic room light controlled using PIR sensor. Where PIR is used to detect the presence of human. [2] Ahmed, Mahmud Shehu, et al., it represents a simple design and implementation of a remote-controlled fan regulator. it enables the user to operate a fan regulator from approximately 10 meters away. [3] Burhanuddin Bharmal et al., LDR based light detection circuit d temperature sensor based fan of off controller circuit [4]. Indeevar Reddy et al., they proposed using IR and LDR sensor for automation of lights and fans using Arduino with Internet of Things for smart homes [5]. Keeratiburt Kanchanasatian Here the author used DHT22 temperature sensors were used to monitor the temperature. HC-SR04 ultrasonic sensors were used to detect the users [6]. Mishra R,e t al., they works on the development of automatic person detection system to control electrical fan and lights using Microcontroller 16F887A. [7] Nikita Bagali, et al., Here the author used Raspberry Pi and IR sensor [8]. Shimi S.L et al proposed a system which operates with control of relays and with the use of WAGO PLC (Programmable Logic Controller) and Arduino Uno. [9] Suresh S it is about automatic room light system by using visitor counters operation [10]. Vahid et al proposed a system whose control is depend on Arduino microcontroller, network communications and Modbus industrial protocol.

2. Existing system

The existing system work consists of automatic device control system which used to control the light control using Arduino and PIR sensor shown in Fig. 1. The components used in this system are Arduino Uno, PIR sensor and relay module. Here the system mainly depends on PIR sensor which helps in detecting human presence. The Relay Module which allows Arduino, Raspberry Pi or other Microcontrollers to control big electrical loads.

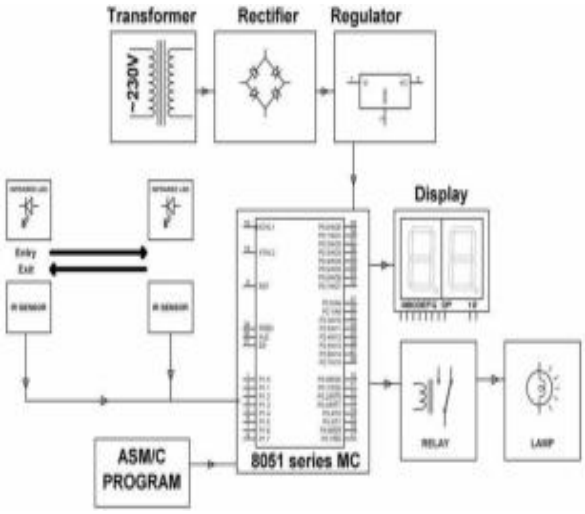

Fig. 1. Block diagram of existing system

RESEARCH ARTICLE OPEN ACCESS

Control of Grid Interfaced wind and solar Energy Sources Used to Ameliorate power quality

S. Ramachandran[1*], M. Ramasamy[2*], S. kalaimani[3*], K. Anjaladevi[4*]
D.Anjali[5*], S. Kiruthika[6*],
[1]*Assistant Professor,Dept.of EEE,Paavai Engineering College,Namakkal*
[2]*Associate Professor, Dept of EEE., K.S.R College of Engineering., Namakkal,*
[3] *Undergraduate Students,Dept.of EEE, Paavai Engineering College, Namakkal*
[4] *Undergraduate Students,Dept.of EEE, Paavai Engineering College,Namakkal*
[5]*Undergraduate Students,Dept.of EEE, Paavai Engineering College,Namakkal*
[6]*Undergraduate Students,Dept.of EEE, Paavai Engineering College,Namakkal*

ABSTRACT
To surmount the constraints in power distribution engendering system, which are been compensating by utilizing contrivances like, series/shunt compensating. This puissance quality quandary should be addressed so incidentally provide congruous quality power at the same time integrating hybrid renewable energy sources. In this project, the design of amalgamated operation of solar and wind array proposed. The proposed system is composed of series shunt controller, wind and PV array connected to DC link by boost converter, which is able to compensate the voltage sag, swell, voltage interruption harmonics and reactive in is landing and interconnecting modes. The renewable energy source hand me down here is photovoltaic (PV) and Wind system. This project presents renewable energy source interfacing mutually the grid that compensates power quality quandaries by a grid interfacing UPQC control. The grid interfacing UPQC gate pulse is engendered by a hysteresis current control method and it has the potency to (1) minimize the harmonic current (2) ameliorate power factor (3) compensate reactive power (4) supply active power to the load in DG. This work is modelled and simulated in MATLAB/Simulink
Index Terms- Renewable Energy, Distribution Generation, Power Quality, photovoltaic, Solar, shunt active filters, series active filter

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I. INTRODUCTION

The potency quality issues can be viewed with veneration to the Solar wind generation, Transmission and distribution network, such as voltage sag, swells, flickers, harmonics etc. However, the wind & Pv engenderer introduces perturbances into the distribution network. The simple method used to run the wind & pv engendering system is to utilize the induction engenderer connected directly to the grid system. The induction engenderer has intrinsically advantages of cost is less and more efficacy and robustness. However, induction engenderers require reactive power for magnetization. Shunt and series active filters predicated on current controlled voltage source inverter are acclimated to interface the intermittent hybrid renewable energy source in distributed system. (1) minimize harmonics current (2)improve power factor (3)compensate reactive power (4) supply active power to the load in DG.

II. SYSTEM CONFIGURATION

The grid interfaced to wind energy source and solar PV array. for sustainable energy dependency, this system is connected to a three-phase grid. The DC motor is Emulated as the Wind source. The solar PV array with Boost Converter, is Connected at the DC link voltage is maintained at constant by GVSC.

The three phase Nonlinear Load is realized amalgamation of uncontrolled rectifier in parallel to the RL Load. Ripple filter out the Switching harmonics, whereas, the repudiation of current harmonics is obtained by the interfacing inductors linked in series with the utility grid. The control algorithms implemented for switching the VSCs provide enhanced perturbance repudiation in integration to which amended system amended system performance is visually examined under solar insolation change, wind speed variations and load disruption.

BOREWELL CHILD RESCUE ROBOT SYSTEM USING ARDUINO

[1]D.Muregesan, [2] S.Mathanraj, [3] A.Praveen kumar, [4] R.Praveen, [5] N.Ranjith
[1]Assistant Professor, [2, 3 ,4,5] UG Students,
[1,2,3,4,5] Department of Electrical and Electronics Engineering,
[1,2,3,4,5] Paavai Engineering College, Namakkal, India

Abstract:

In the past few years, there have been several accidents of children falling into abandoned bore wells in India. Abandoned bore wells that have turned into death pits for children. The problem is all over India. Rescue teams spend hours and sometimes days in futile attempts to save these little kids. A lot of money is also spent in these missions. In most cases they are unable to save the kids. Such events have happened umpteen times in the past, and every time either the government or the bureaucracy is blamed. The rescue process to save the child from bore well is a long and complicated process now. The rescue team tries to approach the victim from a parallel well that take about 20-60 hours to dig. This complicated process makes 70% of the rescue operations fail. The design of handling system is made in such a way that the baby/victim never gets hurt and this rescue system is sent through the same well where the victim is felt inside to bring back the victim safe through an autonomous control of drives. Our design constitutes a best Ergonomic Design and performs safest rescue operation.

Keywords : Rescue Robot & Borewell

1.INTRODUCTION

Today's major problem faced by human is water scarcity, which leads to a large number of bore wells being sunk. These bore wells in turn have started to take many innocent lives. Bores which generate water and subsequently got depleted are left uncovered. Small children without noticing the hole dug for the bore well slip in and get trapped. There is no befitting technique to rescue victims of such accidents. When the make shift local arrangements does not work, Army is called in. In most cases reported so far, a parallel hole is dug up and then a horizontal path is made to reach to the victim's body. It is not only a time taking process, but also risky in various ways. Moreover it involves a lot of energy and expensive resources which are not easily available everywhere and in this process we need big space around the trapped bore that we can dig a parallel bore. Also, the body may trap further in the debris and the crisis deepens even more means death. In most cases, we trust on some makeshift arrangements. This does not assure us of any long term solution. In such methods some kind of hooks are employed to hold the sufferers clothes and body. This may cause wounds on the body of the subject. A single accident creates a big hue and cry spreading a sense of panic among the masses. It draws a lot of undue attention and criticism of the civil administration. Heavy expenses have

IOT BASED MESSAGE SCROLLING LED DISPLAY

Dr.S.Surendiran[1], M. Mathumathi[2], S. Nivetha[3], A. Pon Lucina[4]

[1]Professor, Department of Electrical and Electronics Engineering, Paavai Engg. College, Namakkal, India
[2,3,4]UG Student, Department of Electrical and Electronics Engineering, Paavai Engg. College, Namakkal, India

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Abstract

Notice boards are playing a very important role in our day to day life. By replacing conventional analog type notice board with digital notice board we can make information dissemination much easier in a paperless community. Notice board could be a primary factor in any establishment or public places like bus stations, railway stations, colleges, malls etc. Sticking out numerous notices day to day could be a tough method. A separate person is needed to take care of this notice display. The objective of our project is to design a dot-matrix moving message display using microcontroller and IOT where the characters shift from left to write continuously. In this project we have used ATMega8 microcontroller. ATMega8 is a family of 8-bit microcontrollers. It has a maximum rated processor frequency of 16MHz. The ATMega8 lends itself extremely well to prototyping due to its simple requirement of a 4.5V-5.5V power source. It has a shift out frequency of around 100MHz and storage register of 3-stage output and finally we have used 16x32 dot- matrix display. At first a code was developed. And we got our desired result there. This project is regarding advanced wireless notice board. In IOT based Web Controlled Notice Board, Internet is employed to wirelessly send the message from Browser to the LED display. The main objective of the project is to develop a wireless notice board that displays messages sent from the user's mobile application.

Keywords: IOT, GSM, ATMega8 Microcontroller and Dot Matrix

1. INTROGUCTION

Electronic notice board is a common device that is used to display information. The information or messages are displayed using dot matrix. The wireless system for dot matrix display is a method using Radio Frequency as transmission medium. The system consists of two modules; transmitter and receiver. The transmitter module is used by a user to place a message through an input module such as keypad or keyboard or smart phone. The information then transmitted using WI-FI technology to the receiver. It then will be decoded and displayed on electronic noticeboard.

Information dissemination among employees of a company is necessary for management and administration purposes. Consequently this has been of interest for system designers in a diverse set of applications ranging from development of generalized Chabot or forming an online help assistant. An information exchange tool for knowledge transfer can exist in two ways, the first is performed in the form of a question answer system in which a person readily answers all the queries that one might have. Alternately, there could also be a social forum for information transfer. In companies and educational establishments,

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DESIGN OF AC-DC CONTROLLED RECTIFIER FOR HYBRID ELECTRIC VEHICLE

K.K.Poongodi[1]

[1]Assistant Professor, Department of Electrical and Electronics Engg., Paavai Engg. College, Namakkal, India,

S.Preetha[2], D.Soundharya[2], P.Srimathy[2], S. Nagasoundarya[2]

[2]UG Student, Department of Electrical and Electronics Engg., Paavai Engg. College, Namakkal, India.

ABSTRACT:

Hybrid electric vehicles are important in automobile industry. However, the present-day hybrid electric vehicles are used battery as a secondary source of power. The global warming counter measure, reduction of carbon dioxide is released from vehicles and to increase the fuel efficiency in automobile industry. The auto-manufacturer are contributing their efforts for the development of hybrid electric vehicle.

The existing system was focused on the rectifier circuit. AC-DC conversion of electric power is used in many applications such as adjustable speed drivers, switch mode power supplies, uninterrupted power supplies and battery energy storage. AC-DC converters are referred as a rectifier and are implemented using diodes and thyristors to give an uncontrolled and controlled DC power with unidirectional and bidirectional power flow.

An AC-DC converter supplies an electric power from a commercial power system to an onboard high voltage battery. A highly efficient low-cost hybrid with three phase and three level rectifiers is introduced. A simulation model is implemented in MATLAB/ simulink to test and the results are verified the validity of the proposed system.

Key words- Hybrid electrical vehicle, Three level rectifier, SiC,

I. INTRODUCTION

As a global warming countermeasure, reduction of carbon dioxide released from vehicles and to improve the fuel efficiency in an automobile industry. The auto-manufacturer are contributing their efforts for the development of hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs) and electric vehicles (EVs), from which higher carbon dioxide reduction effects are expected. [2] An Environmental pollution and petroleum conflicts are becoming more serious, the pushes vehicle technologies in the aspects of energy conversation and environment protection. [3&5] A hybrid electric vehicles (HEVs) gives a more potential to save the fuel consumption and to reduce the pollution. A HEV is a vehicle driven by multiple power source and commonly refers to a combination of internal combustion engine (ICE) and electric motor (EM). A hybrid vehicle can drive on only the engine or purely batteries or a combination of both. Toyota prius, ford escape and mercury mariner are examples of this concept, as these cars can be come forward on battery power. They need a high range capacity battery pack for store energy battery in operation.[1] These vehicles have main choice to put a power path that it allows more flexibility in the drive by inter converting mechanical and electrical powers for distributing, at some costing troubles. To equalize the forces from

REAL TIME BIOMETRIC BASED VECHILE SECURITY SYSTEM OF SPEED CONTROL

G.Deivamani [1*], M.Pullaiyannan[2*], K.Sathishkumar [3*], S.Sathish[4*], M.Vishwa kumar[5*]

[1]Assistant Professor, Dept. of EEE, Paavai Engineering College, Namakkal
[2]Undergraduate Students, Dept. of EEE, Paavai Engineering College, Namakkal
[3]Undergraduate Students, Dept. of EEE, Paavai Engineering College, Namakkal
[4]Undergraduate Students, Dept. of EEE, Paavai Engineering College, Namakkal

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Abstract- In This project has an aim to control the speed of two wheeler automatically in cities and also in restricted areas such schools, parks, hospitals and in speed limited areas etc. Now a days in a fast moving world all the peoples are not have self-control. Such peoples are driving vehicles in a high speed. The police are not able to monitor all those things. This paper provides a way for how to control the speed without harming others. Driver does not control anything during such places; controls are taken automatically by the use of electronic system. In this project we using RF for indicating the speed limit areas it is placed front and back of the restricted zones.

RF receiver is placed inside the vehicle. Speed is acquired by the help of speedometer in the vehicle. The controller compares the speed. If it exceeds the limited speed the controller controls taken automatically. In addition we added biometric and fingerprint based password security system. This system will help for the user of vehicle and prevent from theft.

If user forget the password they can use their fingerprint to unlock the vehicle. Fingerprint is match after enter the password the motor is start.After receiving this signal RF transmitter sends a signal to the motor to reduce the vehicle speed automatically which can control vehicle speed immediately. Vehicle is controlled automatically without any manual operation when the vehicle is at 50 meter distance away from the front school zone.

INTRODUCTION:

At present accidents are mostly occurs due to rash driving and over speed in road. People do not bother about human lives. The accidents rates are increasing year to year by more vehicles on to ground. The government has taken too many steps to prevent this kind of things but it not enough. Most of the manufactures has developed a laser based control system but its cost is too high. But it is again a difficulty when human crosses the road it cannot detect properly so we tried to develop a system to control these things in a simple manner. At first we have an idea to use laser diodes but it was costly so we go for IR module again there is a draw back in using this it works under line of sight so finally decided to use RF.

Unfortunately, drivers usually do not take these speed limits seriously and ignore them. Road accidents can be prevented by adopting measures such as Traffic management, improving quality of road infrastructure and safer vehicles. To ensure decline in accidents and to improve road safety, speed control techniques such as speed control in school and hospital zones by using RF transceiver.

The RF transmitter is placed in the speed limit areas and RF receiver is placed in the system which is placed inside the vehicle. RF transmitter transfers the information about the speed of the zone to the receiver which is interfaced with microcontroller. The current speed will be sensed by the proximity sensor using dc motor that also sends information to controller. The controller compares both speed, if speed of vehicle is greater than speed limit of the area then message is given to the driver through LCD Display to reduce the speed. And if driver does not decreases the speed, the control transfers automatically. But the driver again operate it manually and exceeds the limited speed the message is given to the nearest RTO Office through GSM. The message contains the current speed and number of the vehicle.

EXISTING SYSTEM

Objective of this project is to develop a system to keep the vehicle secure and protect it by the occupation of the intruders. The main aim of the project to develop a system automatic speed control of vehicle and accident avoidance using eye blink sensor and ultrasonic sensor .whenever any obstacle is detected in running vehicle depends on distance automatically control the speed of vehicle. The driver in sleeping /drowse position the eye blink sensor detects the eye blink is not more than 30 sec eye closed vehicle stop the automatically, it is not manually. Give alarm to driver alert.

The ultrasonic sensor system continuously sends signals and monitors any car or other obstacles are in front of car. The distance up to which ultrasonic sensor can work may be up to 4 meter. When any obstacle or vehicle detected by ultrasonic sensor system it will send signal to the embedded board. After receiving this signal embedded board sends a signal to the motor

Harmonics Sensing Smart Meter Using Arduino

S.Thirunavukkarasu
Associate Professor, Department of Electrical and Electronics Engineering
Paavai Engineering College, Namakkal, Tamil Nadu, India

A.Sanjeet, S.Santhosh, N.Sriram, S.Sridhar
UG Students, Department of Electrical and Electronics Engineering
Paavai Engineering College, Namakkal, Tamil Nadu, India

Abstract- In this article, the value of THD is found using the FFT method. Due to increase in usage of electrical appliance, it may consume more power. It may also produce harmonics in power signal and variation in the power factor. Some of harmonics in the power signal are harmful to sensitive equipment and also cause power loss. It is essential to analyze the power signal and find the value of THD (Total Harmonic Distortion) using the Fast Fourier Transform method. It is therefore important to find such harmonics and use different harmonic mitigation techniques to get the pure signal for safe operation of the connected equipment and minimize the power loss. Here we also calculate the value of power factor to avoid damage to the machines in the generating stations. The power factor value is also determined to balance the inductive and capacitive load. The THD value and the power factor value are calculated for both single phase and three phase circuits.

Keywords – Analysis of harmonics, Potential transformer, Arduino, Power factor, Induction Motor.

I. INTRODUCTION

In the modern world we are under necessity to use the electrical equipment in our day to day life and it becomes one of our essential requirements. The usage of power electronic has drastically increased in commercial, domestic and industrial equipment. There are many advantages of power converters such as high power density, small losses and low weight. Harmonics are voltages or current with frequency that are integral multiple of fundamental power frequency being 50 or 60 Hz. In [1] it details the design and implementation of harmonic analyzer for analyzing the harmonic content in the power signal. The analyzing of power signal is carried out by DSP based instrument that make use of signal processing techniques. The module of analog to digital converter is one of the key interfaces to the real world. The TMS320F2812 has an integrated 12-bit ADC.In [2] it deals with the single phase as well as three phase power factor correction, reactive power and THD compensation using Arduino UNO micro controlling chip. This detects the power factor lead\lag and improves the power factor automatically. In [3] the article details about the fault diagnosis in the CHB multilevel inverter.
The fault is caused due to interactions of switches in the multilevel inverter. The possible switch fault location is determine by the normalization factor (NF) of the output current and THD value. The fault signal is identified according to the threshold level. In [4] high burden is created on the feedback current correction loop due to harmonic distortion induced by current transconductance amplifier and it may comprises the measurement accuracy. By recording THD level in the load current periodically, we can test the stability of this method. In [5] the THD value is measured using low pass filter and a grid monitoring system which provides fundamental and harmonic components of the grid voltage. This method is developed by using SOGI error signal notch filter transfer function. It can be easily implemented into the digital signal processing (DSP) as it has small computational burden. The behavior of the method in front of grid perturbations, such as frequency steps and voltage sag perturbations was also analyzed.

II. PROPOSED ALGORITHM

2.1 The proposed Harmonics sensing smart-

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COST EFFECTIVE CONVERSION OF ELECTRIC BIKE

G.Uma Maheswari[1], B.Vimalan[2], K.Vimalnath[3], K.Witney Jefferson[4], N.Vignesh[5]

[2,3,4,5] Final Year EEE, Paavai Engineering College, Namakkal, Tamilnadu, India.
[1]Associate Professor EEE, Paavai Engineering College, Namakkal, Tamilnadu, India.

ABSTRACT: Air pollution from motor vehicles and exhaustion of natural resources has become a serious global and environmental hazard. The emission of poisonous gases such as carbon monoxide(CO), nitrogen dioxide(N_2O), sulphur dioxide(SO_2) and other hazard gases from two wheelers is a significant contributor to air quality problems which cause severe threats to all living organisms. Due to increase in number of vehicles and limited use of emission control strategies, two wheelers are considered to be a significant source of urban air pollution in most of the Indian cities.

To overcome such harmful effects, the modification of existing fuel operated bike into an electric bike is necessary. The alternate method involves the use of battery as the primary source. The high efficient brushless dc motor uses the supply from the battery to drive the wheels where the controller is used to govern the supply. Though this efficient operation is facilitated.

The conversion of existing bike into hybrid bike is cost effective and predominantly it reduces the number of air pollutants as well as the maintenance cost is much less compared to existing models.

Keywords: Electric Bike, Harnessing, Solar energy, Economical, Electricity Nomenclature: P = Power N = revolution per min T = Torque σs = Shear stress σt = Tensile stress σut = Ultimate Tensile Stress fos = Factor of safety.

I. INTRODUCTION

Global warming is a major concern all around and to save Mother Earth, there are several policies, promises and pledges. With the ever-increasing emission of greenhouse gases, there is an increased fear of environment pollution with modern technology and innovation, transportation and communication have undergone a paradigm shift. Along with this, we are also step experiencing the negative effects of industrialization in the form of global warming. Under these circumstances, when there are traffic jams, when you need to run an errand at an odd hour of the day, when you need to go to workplace quickly, you stumble and fumble as there are so many vehicles emitting heat and CO2 polluting the air. With increased number of fossil-fuel dependent vehicles, they not only add to greater level of pollution but are also leading to depletion of fuel resource. It is here that automobile companies felt the need to innovate motorized vehicle that will get charged through electricity and will not be depending on fossil fuels.

This led to expansion of eco-friendly initiatives and many automobile manufacturing companies invested in research and development to bring forth electric bikes that will help people save a few bucks by reducing consumption of already spiralling fuel price, besides fighting global warming. Most electric bikes are emission-free bikes and this is the USP of the company's manufacturing them in these days of global warming. It will not add to urban pollution. The only thing required is to keep this bike charged with a battery. Electric bike manufacturing is considered as a grass root movement away from fossil fuels.

Definitely, electric bikes are not the only answer to our environment problem, but it definitely will help us to treat environment better. These electric bikes will not make pollution worse and that makes E bikes environmentally safe vehicle. It can be charged with the help of inverter and generator too. In one charge, these electric bikes can go up to 50km and has no tail pipe emissions. It also makes no noise while under operation. The best part of electric vehicles is that they can be run with no registration and license.

In the manufacture and production of electric bikes, the main constraint is the battery in the bumpy roads. Batteries get deteriorated at a fast rate due to excessive current fluctuation. Batteries need frequent replacement and that is the greatest concern for the most Indian companies who manufacture these electric bikes. The replacement cost of the batteries hover around Rs.5000, but otherwise the maintenance cost of electric bikes is almost negligible. There is a growing

Journal Pre-proof

Ant Colony Optimization Technique tuned controller for Frequency Regulation of Single area Nuclear Power Generating System

Boopathi Dhanasekaran [a], Saravanan Siddhan [b] , Jagatheesan Kaliannan [c]

[a, c] *Assistant Professor, Department of Electrical and Electronics Engineering, Paavai Engineering College, Tamilnadu, India – 637018.*

[a] *Dhanasekara5002@gmail.com*

[b] *Professor and Head, Department of Electrical and Electronics Engineering, Muthayammal Engineering College, Tamilnadu, India – 637018.*

[b] *Siddhanvu491@gmail.com*

Abstract

Obtaining energy from the power generating unit is a more critical issue in recent days due to the sudden increasing load demand than that of the past. In this proposed work the Load Frequency Control (LFC) of nuclear power system is studied by implementing the Proportional Integral Derivative (PID) controller as a secondary controller. The controller gain values are optimized by utilizing Ant Colony Optimization Technique (ACOT) by considering three different cost functions (Integral Absolute Error (IAE), Integral Time Absolute Error (ITAE) and Integral Square Error (ISE). Also, the effect of different energy storage units Hydrogen Aqua Electrolyzer (HAE), Superconducting Magnetic Energy Storage (SMES), Redox Flow Battery (RFB) is also verified by considering one percent step load disturbance in the investigated system. Finally, the simulation result obviously shows that ITAE cost function gives better result in terms of minimal domain specification parameters with good stability. Also, SMES improves the performance of system over HAE and RFB energy storage unit.

KEYWORKS: Load Frequency Control (LFC), Ant Colony Optimization Technique (ACOT), Integral Time Absolute Error (ITAE), Interconnected power system, Energy storage unit

1. Introduction

The power mismatch between generation and load demand creates an inevitable oscillation in the system frequency and the tie-line power flow from its predetermined nominal value [1-3]. The indispensable controlling strategy is utilized in Automatic Generation Control (AGC) and this technique is used to keep the system parameters within the specified (Tie-line as well as system frequency) limit at the time of emergency load condition/sudden small step load demand in the interconnected power system [1-3]. To overcome this crisis, prober control strategies are required to regulate the system operation within the desirable value. Therefore, efficient methods are implemented within the parameter value at emergency situations in power system. Based on the literature survey it is clearly showed that a greater number of controllers are invented and implemented in power generating system. Best / suitable ways of improving system performance is by implementing suitable controllers in the power system. In power system the secondary control loop gets major role over the primary control loop (Speed Governor Regulator) [1-3].

HEAT TRANSFER AND FRICTION FACTOR CHARACTERISTICS OF PIPE-IN-PIPE HEAT EXCHANGER FITTED WITH VARIANT PLAIN TAPE INSERT

by

Arthanari Ponnusamy SIVASUBRAMANIAM[a*], Mayilsamy KAVANDAPPA GOUNDAR[b], and Murugesan PERUMAL[c]

[a] Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India
[b] Department of Mechanical Engineering, PSG College of Technology, Coimbatore, Tamilnadu, India
[c] Department of Mechanical Engineering, K.S.R Institute for Engineering and Technology, Namakkal, Tamilnadu, India

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The heat exchanger is used to transfer heat between the fluids without mixing them for both cooling and heating processes. Normally the fluids are separated by a solid wall or tube that is made of different materials in order to avoid mixing. The performance of a heat exchanger is predicted on the basis of heat transfer rate. Many new techniques are being explored by industries to improve the heat transfer rate of heat exchangers. In this work, a double tube heat exchanger is used for studying the variation in heat exchange by inserting a flat tape with different geometries: plain tape, plain tape step cut arc, and plain tape step cut rectangle. Experiments are carried out by varying pressure of hot water and the evaluation is done for different mass-flow rates with inlet temperatures of hot and cold water at 53 °C and 30 °C, respectively, under counter-flow arrangements. The experimental results revealed that the plain tape inserts in counter-flow arrangements enhance heat transfer rate substantially thereby increasing the effectiveness of the system for a marginal increase in pressure drop.

Key words: *double tube heat exchanger, plain tape, plain tape-step cut arc, plain tape-step cut rectangle, Nusselt number, Reynolds number*

Introduction

Heat exchanger interchanges the heat among fluids of various temperatures, which are separated by a solid wall or any other medium. In the utilization of thermal energy, it is very important to control the temperature of the incoming and outgoing fluid streams. The temperature gradient or the differences in temperature facilitate the transfer of heat. Transfer of heat could occur through either of the three heat transfer principles: radiation, conduction, and convection. Conduction takes place as the heat from the fluid at elevated temperature passes through the solid wall. The wall must be thin and fabricated from a completely conductive material to increase the heat transfer rate. Convection plays the most important role in the

* Corresponding author, e-mail: visuga@rediffmail.com

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Machining parameters optimization in laser beam machining for micro elliptical profiles using TOPSIS method

V. Senthil Kannan [a,*], K. lenin [b], P. Navneethakrishnan [c]

[a] Faculty of Mechanical Engineering, Paavai Engineering College, Pachal, Namakkal 637 018, Tamilnadu, India
[b] Faculty of Mechanical Engineering K. Ramakrishnan College of Engineering, Trichy 621112, Tamilnadu, India
[c] Faculty of Mechanical Engineering, Anna University, BIT Campus, Trichy, Tamilnadu, India

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ABSTRACT

The material removed from the surface of the material in the laser beam machining is basically depends on the parameters like laser power, cutting speed, pressure of the gas and pulse width. Among all the parameters laser power and cutting speed plays vital role in the case of surface finish, shape and size of the final machining condition. Here, an attempt was made to find the optimum parameters to make the elliptical profile in the aluminium based composite material. For that, dimensions and mathematical characters like area, perimeter were selected as the output responses. L9 orthogonal array with Taguchi method was selected to conduct experiments and to study the effect parameters on the responses. For utilizing the better parameters in future analysis for making micro elliptical profile on the aluminium based composite, an ideal multi objective optimization method TOPSIS was utilized in this work.
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1. Introduction

Laser beam machining is one of the major unconventional machining process to get desired shape and size of the machining. From, Avanish Kumar Dubey and Vinod Yadava, "Laser beam machining—A review", International Journal of Machine Tools & Manufacture, vol. 48, 2008, pp.609–628 [1] laser beam machining is focused for melting, vaporising to remove material to get desired shape. It is also suitable for making miniature holes in sheet metal, precision machining of micro parts and machining of complex shapes.

The desired shape and size of the miniature and micro holes were entirely depends on the suitable machining parameter. Thus, the process performance can be controlled by the proper selection of the machining parameter. Kuar et al. [2] was conducted the machining the micro drilling on the Zirconium oxide to identify the performance of the CNC pulsed Nd:YAG laser. For obtaining the small HAZ thickness and taper in the micro drilling optimum setting parameters such as pulse frequency and pulse width, gas assisted pressure were identified Sharma et al. [3] carried out an experiment by Nd:YAG laser cutting of nickel based super alloy thin sheet to find the parametric optimization of Kerf characters. The results shows that the optimum parameters for curved profile is totally different from straight profiles.

Adalarasan et al. [4] were carried out an experiment to find the optimum parameter for getting better kerf characteristics and they used grey based response surface methodology for the same.

To obtained the better quality, size and shape, it is essential to optimize the parameters with various responses. In that situation it is not advisable to consider the single objective optimization method for optimize the parameter. So, multi objective optimization technique has turned increasing and important one. Shivade and Shinde 2014 used Taguchi method Gray Relational Analysis. Kumar A., Soota T., Kumar J. Optimize wire-cut EDM process parameter by Grey-based response surface methodology and Kumar et al. (2015) applied desirability function for finding out the optimal process parameter values. Nearly in 2017 Shivakoti et al. recommended the TOPSIS method with fuzzy logic multi objective technique to examine the process parameter for high strength micro marking on gallium nitride (GaN).

Biswas et al. (2015) and Zhang et al. (2015) conduct the experiment and analysis the parameters in micro turning, micro milling was done by Darwish et al. (2017) and micro marking in LBM by Shivakoti et al. (2017). It is clearly known that, from previous studies most of the researchers were made the investigation and analysis in the micro drilling, micro milling and micro turning.

* Corresponding author.

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Investigation in machining parameter of micro profile and surface characteristics of Al7475 with SiC alloy in LBM

V. Senthil Kannan [a], K. Lenin [b], P. Navneethakrishnan [c]

[a] Faculty of Mechanical Engineering, Paavai Engineering College, Pachal, Namakkal 637 018, Tamilnadu, India
[b] Faculty of Mechanical Engineering, K. Ramakrishnan College of Engineering, Trichy 621 112, Tamilnadu, India
[c] Faculty of Mechanical Engineering, Anna University, BIT Campus, Trichy, Tamilnadu, India

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ABSTRACT

In today's market utilization of suitable machine for machining of composites for the application of aircraft and automotive parts was crucial one, because of their high strength with low weight ratio. Also, the profile such as micro elliptical shape was machined to reduce stress concentration of the area which is in contact with loads. Since the regular circular profile has affected high amount stress concentration than that of elliptical profile for the same loading conditions, an attempt was made in machining of micro elliptical profile on the Al 7475 composite material by using the laser beam machining (LBM). For betterment of profile (dimension and good surface) an analyze was done on the parameters such as scanning speed and laser power of the LBM, The dimensional stability as well as surface qualities were determined and the suitable parameter was suggested for the future work in Al 7475 composite with LBM.
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1. Introduction

Aluminium composites were widely used in aircraft, automotive and medical appliance due to their special characteristics such as low weight, high corrosive resistance and electrical resistance. The machining of such material by conventional technique was quit complex owing to their high strength. Now a day's laser beam machining found effective and efficient machining method for machining of micro profile. Pulsed laser is mostly used for machining of micro profiles due to low pulse with high power. Nd:YAG laser beam emits high power with narrow wavelength photons than conventional Co2 laser beam. Micro machining under LBM was affected by some machining parameters such as cutting speed, laser power, spot size, pulse width and these are compatible and good relationship with the size and the shape of the profiles. (Chryssolouris 1991; Olsen and Alting 1995). Even though the gas assisted pressure determines the size, shape and dimensions of the micro profile, laser power and cutting speed plays major role in LBM (Darwish et al., 2016) [4,7]. The adjustment of above parameters was responsible for achieving the good quality of micro profile but this is time consuming and tedious process. Therefore, researchers are having good scope to achieve better results.

It is difficult to find the suitable parameter for multiple objectives by approximation and theoretical methods. Although there are many approximation methods and theoretical solutions available to relate the machining process, they are not considering as effective one. Hence, modelling is essential for the quality of machining in function of machining parameter.

2. Literature review

In machining to obtained the better quality it is essential to optimize the parameter for different and contrast objectives. In that situation it is not advisable to consider the single objective optimization method for optimize the parameter. So, multi objective optimization technique has turned increasing and important one. Several researchers uses various optimization techniques like Taguchi method (Shivade and Shinde, 2014), Gray Relational Analysis (Kumar A, Soota T, Kumar J Optimization of wire-cut EDM process parameter by Grey-based response

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Experimental Investigation of Passive Heat Transfer Enhancement Using in Plain Tape Insert

*A.P.Sivasubramaniam[1], K.Mayilsamy[2] and P.Murugesan[3]
[1]*Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India*
[2]*Department of Mechanical Engineering, PSG College of Technology, Coimbatore, Tamil Nadu, India*
[3]*Department of Mechanical Engineering, K.S.R Institute for Engineering and Technology, Namakkal, Tamil Nadu, India*
Email: [1]visuga@rediffmail.com, [2]k_mayilsamy@yahoo.com, [3]pmksrct@gmail.com

Abstract

In present days, almost all the industries that use heat exchangers use them at present with inserts required to improve the convective heat transfer rate of the system without the overall performance getting affected. Even the inserts can be conveniently set up and require less maintenance aside from the cost benefits.Given the successful role of inserts in the usage of exchangers, the present study experimentally examines the contribution of plain tape inserts that are mounted within the plain tube of a dual pipe heat exchanger (DPHE) to increase the system's heat transfer capacity.Using a simple tube under counterflow structure for variable pressure drops in hot water, an experimental system is used to conduct the test process and measurement is performed for various mass flow speeds of hot and cold water inlet temperatures at 53^0C and 30^oC respectively.From the experimental measurements the thermal enhancement factor and even the properties of heat flow and friction effect are learned from the results of the experiments.The experiments are repeated with the proposed insert profiles to compare the results with that of the plain tube. It is observed from the tests that the plain tape insert gave the highest thermal enhancement level.

Keywords: *Heat transfer enhancement, friction factor, plain tube & plain tape.*

1. Introduction

The double pipe heat exchanger may be a way of simplifying the interchange of two fluids with heat b / w by not reacting at various temperatures.Two forms of heat transfer occurs in heat exchanger such as convection & conduction. Typically convection happens in each operating fluids & conduction through walls of heat exchanger that separates the fluids. The potential to increase the coefficient of heat transfer along with reduced reduction of the friction factor determines the inserts.For various industrial areas, tube extensions are used for developments in the heat transfer of fossil fuel and for chemical plants in just a few years.The second law increases effectiveness and entropy production by raising the driving force of properties as compared by the rise in the coefficient of heat transfer.The research provides an evaluation of friction factor & heat transfer coefficient for various inserts of different thicknesses and materials (Aluminum & Copper) discussed by **AjitShinde et al., [1] [2]**.

*A.P.Sivasubramaniam1

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Simulation Studies of Heat Transfer Enhancement in a Double Pipe Heat Exchanger Fitted with Plain Tape Insert

A.P.Sivasubramaniam[1]*, K.Mayilsamy[2] and P.Murugesan[3]

[1]*Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India*

[2]*Department of Mechanical Engineering, PSG College of Technology, Coimbatore, Tamil Nadu, India*

[3]*Department of Mechanical Engineering, K.S.R Institute for Engineering and Technology, Namakkal, Tamil Nadu, India*

Corresponding Author
E-mail Id:-visuga@rediffmail.com

ABSTRACT

Heat exchangers are important devices that are commonly used in various industries such as processes, petroleum refining, chemicals, oil industries, power plants, and paper, etc. The demand for high efficiency heat exchangers has been driven by energy and material saving requirements as well as environmental challenges in the industry. In order to improve the heat exchanger performance, an increase in the heat transfer in heat exchangers is required.In addition, heat transfer improvement makes it possible to greatly reduce the size of the heat exchanger. For a compact heat exchanger, a high heat transfer rate with minimum space requirement is required. The counter flow heat exchanger increases the heat transfer feature of the plain tube with plain tape insert in the inner tube. To predict the Nusselt number, Reynolds number & Thermal enhancement factor based on the numerical calculation with help of ANSYS software.

Keywords:-*Nusselt number, friction factor, thermal enhancement factor, reynolds number and plain tape.*

INTRODUCTION

The heat transfer enhancement capability beside a reduced the loss in friction factor defines the tapes. In various industrial areas such as fossil fuel refineries and chemicals plants for several years the tube inserts are used for improving heat transfer. For a heat exchanger there can be some different flow patterns. General types of heat exchangers are counter flow, parallel flow, & cross flow. The most effective flow method of the three is a counter flow heat exchanger. A counter flow heat exchanger is the warm fluid that enters at one end of the heat exchanger and the cold fluid that exits at the same end of the flow path. Counter flow is the most popular type of fluid to fluid heat exchanger; since it is the most effective type. Sudha Brahma Naidu & Kishore [1]the heat transfer studied is essentially a slow process and is strengthened by passive or active improvement methods.

The heat transfer and pressure drop performance with twist ratios 4 and 5 shows better results, despite the comparable pumping energy consumption of tubes with or with-out a twisted tape. Suvanjan Bhattacharyya et al., [2] A non-uniform three-dimensional grid was developed to examine the heat transfer performance critically. Studies show that as contrasted with simple twisted tape

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Mathematical modeling and investigation on aluminium bronze MMC using ECM process

A. Jayapradha [a], G. Jims John Wessley [b], G. Vimalarani [c], P. Ramesh Kumar [d], Ram Subbiah [e], S. Maniraj [f]

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Abstract

The electrochemical based energy processes are used to remove material for intricate contours or cavities. The main features of the electrochemical processes are no mechanical and thermal stresses are produced during operations. The Electro-Chemical Machining (ECM) was used to produce the machining parts with high quality of surface finish. This chapter was used to discuss the machinability behaviours of aluminium bronze through ECM which was produced from stir casting method. The Surface Roughness (SR) was measured with the help of input factors such as voltage, electrolyte flow rate and its pressure. To achieve optimal surface roughness, the effective optimization tool like as taguchi technique was applied. Analysis of variance was applied to determine the most involvement factor on SR based on the highest F value and percentage of role of factors. The electrical voltage has provided the considerable effect on surface roughness.

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Original Article

Experimental investigation on the effect of ceramic coating on the wear resistance of Al6061 substrate

Suresh Chinnusamy[a,*], *Venkatachalam Ramasamy*[b], *Subburam Venkatajalapathy*[a], *Gobinath Velu Kaliyannan*[c], *Sathish Kumar Palaniappan*[d]

[a] *Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, 637018 India*
[b] *Department of Mechanical Engineering, K.S.R. College of Engineering, Tiruchengode, Tamil Nadu, 637209 India*
[c] *Department of Mechanical Engineering, Kongu Engineering College, Erode, Tamil Nadu, 638060 India*
[d] *Department of Mining Engineering, Indian Institute of Technology, Kharagpur, West Bengal, 721302 India*

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ABSTRACT

In the present research work, various ceramic materials such as Al_2O_3 - Cr_2O_3 - SiC, and Al_2O_3 - ZrO_2 - TiO_2 were developed for the analysis of wear performance and hardness. The specimens were coated using plasma spray coating technique. A bond coat of 50 μm thickness was applied on the substrate using NiCrAlY for good adhesion before laying the top coat. The wear behaviour and hardness of the samples were investigated by wear and hardness tests. The Energy Dispersive X-ray Analysis (EDAX) was performed to analyse the chemical composition of the samples. The Field Emission Scanning Electron Microscope (FE-SEM) was used to analyse the surface and cross-section of the samples. X-ray diffraction (XRD) studies are carried out to understand the structural and crystallographic information. The performances of the coated and uncoated samples were compared and investigated. It was observed that the specimen with Al_2O_3 (60%) + ZrO_2 (20%) + TiO_2 (20%) coating produced best results for wear rate (0.03612 mm^3/Nm) and Coefficient of friction (0.357). The proposed ceramic coating composition could be recommended for automobile components that require good wear and heat resistance to improve the service life.

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1. Introduction

Aluminium alloys offer a wide range of desirable properties and find applications in the fabrication of engineering structures. The 6000 series aluminium alloys are utilized in the production of cylinder blocks, crankcases and pistons as considerable amount of weight savings can be effected. Especially, Al6061 alloy possesses many favourable characteristics like heat-treatability, good toughness, corrosion resistance along with mechanical strength which make it suitable to cater medium and high strength structural applications. The internal combustion (IC) engine components such as piston and cylinder liner are generally produced using steel, cast iron, and aluminium alloys. These parts experience wear regularly

* *Corresponding author.*
E-mail: sureshbeksr@gmail.com (S. Chinnusamy).
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Design And Analysis Of Fire Tube Boiler With Heat Flow Analysis

S. Gopalakrishnan, M. Makesh

Abstract: Boilers are used to generate steam that provides heat or power. Water is converted to steam in the boiler. This steam travels through the heating apparatus which any piece of equipment that requires steam for operation. In fire tube boilers, the combustion gases travel within the tubes to heat the surrounding water. In water tube boilers, on the other hand, the water travels inside the tubes and the heat on the outside. The objective of this project work is to improve the heat transfer rate of Fire tube boiler using various materials. The following materials are considered for designing fire tube of boiler such as Copper, Aluminium, Chromium. The model of fire tube boiler is modeled through CREO software. The Three different models are create with same shape and size but different such as copper, aluminum and chromium. The models made up of different material are numerically analyzed for its various thermal behaviors through the analyzing software ANSYS from analysis we obtained different temperature and heat flux for all three materials respectively. The three analysis shows copper performance is more effective than aluminum and chromium.

Key words: Boiler heat flow analysis, Fire tube Boiler.

I. INTRODUCTION

The purpose of boiler is to convert water into steam. The steam can be used for various usages such as driving an engine to generate electricity, heating purpose and for other industrial process applications. The boiler consists of several types, which include water tube boiler, fire tube boiler, packaged boiler, fluidized bed combustion (FBC) boiler, atmospheric fluidized bed combustion (AFBC) boiler and so forth. The most popular boilers that used in many industries are water tube and fire tube boiler. Water tube boiler is the one with water flowing through the tubes that enclosed in a furnace heated externally while fire tube boiler comprises of fire or hot flue gas directed through tubes surrounded by water. Heat recovery steam generator (HRSG) is a good example of system in power plant that utilizes the boiler tube, typically a water tube boiler. In a combined cycle gas turbine power plant, there are three major systems incorporated together, which are gas turbine, steam turbine and HRSG. According to Ganapathy (2003), the combined cycle plant incurs lower capital costs than the other power plants such as conventional fossil power plants, and it is the most efficient electric generating system available today. The function of HRSG is to recover heat from the exhaust gas discharged from the gas turbine and makes use of the heat energy to produce steam. The steam produced will flow through steam turbine to generate electricity. A fire-tube boiler is a type of boiler in which hot gases pass from a fire through one or (many) more tubes running through a sealed container of water. The heat of the gases is transferred through the walls of the tubes by thermal conduction, heating the water and ultimately creating steam. The fire-tube boiler developed as the third of the four major historical types of boilers: low-pressure tank or "haystack" boilers, fluid boilers with one or two large flues, fire-tube boilers with many small tubes, and high-pressure water-tube boilers. Their advantage over fluid boilers with a single large flue is that the many small tubes offer far greater heating surface area for the same overall boiler volume. The general construction is as a tank of water penetrated by tubes that carry the hot flue gases from the fire.

II. LITERATURE REVIEW

The Unit 10 stoker boiler at the University of Iowa (UI) power plant uses moving grate on to which pulverized coal is thrown. The modeling of the combustion ofthe coal on this moving grate is very complex and effort has been made in the past to come up with simplified models for use in CFD. The most common are fixed-bed models, utilizing either transient combustion calculations or approximate reaction equations in order to determine the boundary conditions at the grate resulting from the combustion of the solid fuel on the bed. Due to the popularity of fixed-bed modeling, there are multiple approaches for it found in the literature: one-dimensional in space, onedimensionalin time, two-dimensional in space, and models that combine spatial and transient analyses. Fully three-dimensional models can be developed and solved using methods such as Direct Numerical Simulation, but these are very computationally expensive. The simplest model for fixed bed modeling is a one-dimensional model of the heat release and concentration profiles over the grate length. Goerner and Klasen used this approach to approximate the temperature profile over the grate by integrating theheat generation profile over the grate, which was determined with mathematicalsubmodels created by the Institutes of Environmental Process Engineering and PlantDesign, and by solving basic equations for the relation between temperature and sensibleand latent heat release. They also determined concentration profiles for the species involved in the combustion by using simple balanced reaction equations. In validating their results, the researchers found that while the trends of the measured temperatures and the modeled ones were fairly similar, there was significant error in the magnitude of the temperatures. According to the authors, this error most likely resulted from the simplified reaction equations, which did not include non-stationary process conditions (Goerner2006). A one-dimensional transient model for a fixed bed was developed by Zhou et al.in order to perform numerical simulations of straw combustion (Zhou 2005). The modelis transient only for the reaction calculations for the solid phase combustion, so it was notable to be used to approximate a moving grate. Since it utilized transient combustion, thesolid phase and gas phase reactions were coupled into a four step process: evaporation ofmoisture, volatile release/char formation, burning of the volatiles, and the oxidation ofthe char

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Hardness performance analysis of chromel composite using end and lateral quenching method

Santhanakrishnan Raman [a,*], J. Vairamuthu [b], B. Stalin [c], Ram Subbiah [d], S. Maniraj [e]

[a] Department of Aerospace Engineering, Amity University – Maharashtra, Mumbai-Pune Expressway, Bhatan 410 206, Panvel, Navi Mumbai, India
[b] Department of Mechanical Engineering, Sethu Institute of Technology, Pulloor, Kariapatti 626 115, Tamil Nadu, India
[c] Department of Mechanical Engineering, Anna University, Regional Campus Madurai, Madurai 625 019, Tamil Nadu, India
[d] Department of Mechanical Engineering, Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, Telangana, India
[e] Department of Mechanical Engineering, Paavai Engineering College, Namakkal 637 018, Tamil Nadu, India

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ABSTRACT

The achievement of materials hardness was difficult in heat treatment through quenching methods. At the same time, the quenching medium was not covered the entire surface of the work piece. In present topic was discussed about the development of water quenching method for chromel composite. For these experimental investigations, the different levels of control factors were considered such as water velocity, the rotational speed of the work piece, and Standoff Distance (SOD). The response such as hardness was evaluated according to the variation of control or input factors. The effects of quenching factors were reported through the Taguchi technique and variance analysis. The maximum hardness of 545BHN was achieved through the developed quenching apparatus. The water velocity (74.22%) was the influential factor on hardness. It was validated through variance analysis.
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1. Introduction

The applications of hardened materials have been increased gradually in all fields especially construction and manufacturing sectors. The effect of quenching and improved substance properties were analyzed [1]. The particulates of composites were strengthened through the quenching method [2]. The cooling rate and its effects have been discussed in aluminium composite [3]. The material structure depended on its temperature which was provided during the casting process [4]. The stir casted material was quenched by the developed model [5]. The Taguchi optimization was performed based on L_9 orthogonal array and its effect of factor has been confirmed through variance test [6–25]. The sintered aluminium composites were kept under solution treatment with different temperature and its microstructure was studied [26]. Al 6063 was treated under age-hardened and its effects of silicon carbide particles have been discussed [27]. The Jominy end quench method was executed on aluminum alloys and its Vickers hardness was determined [28]. In Jominy end quench process, the cooling rate was directly proportional to the distance from the quenching end [29]. Micro structural and characteristics of Al-Zn-Mg-Cu alloy were investigated under different aging circumstances [30]. The rapid cooling and its effects have been analyzed in aluminium and silicon alloys [31].

The present investigation deals with the modified water quenching apparatus for the heat treatment of the material. For experimental purposes, chromel composite was considered and its hardness was measured after the end and lateral quenching process.

2. Experimental method

The experimental arrangement with the developed model was shown in Fig. 1. The chromel composite was converted to the required shape and a size of 25 mm diameter and 100 mm length. The heat-treated work piece was held rigidly on the chuck and it was rotated. The water quenching was applied at the end and lateral surface of the work piece. Therefore, uniform cooling was provided on all surfaces of the work piece. The control valves were used to regulate the flow of water. After the quenching process, the water was returned to the collecting tank. Hence, it was one

* Corresponding author.
E-mail addresses: drsanskrish@gmail.com, sraman@mum.amity.edu (S. Raman).

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Application of TOPSIS for Optimization of Operating Parameters in Micro-EDM

M. S. Vijayanand[1], K. Ajith Kumar[2], Adite Mathew[3], R. Ashok[4], A. Abdul Rahim[5]
[1]*Assistant Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal, India*
[2,3,4,5]*UG Student, Department of Mechanical Engineering, Paavai Engineering College, Namakkal, India*

***Abstract*: The efficiency of a manufacturing process strongly depends on the selection of appropriate process parameters. Most of the machining parameters are determined by human judgements based on experience or hand book values some time. This does not ensure the optimal or near optimal performance. The selection of most suitable cutting parameters is a multi-criteria decision making problem which is based on the several qualitative and even conflicting factors involved. In the present work, Experiments have been conducted by considering three parameters such as discharge current, pulse on time and pulse off time each at three levels for obtaining responses like material removal rate, tool wear rate and overcut. Taguchi L9 orthogonal array is used as it helps to collect information regarding the response parameters with less number of experimental runs. This Current work demonstrates the application of TOPSIS method for determination of suitable machining parameters for making micro holes in Monel 400 Alloy.**

***Keywords*: Optimization, TOPSIS, micro EDM, Process parameters.**

1. Introduction

Micromachining is the most fundamental technology used for the production of miniaturized parts and components [1]. Micro-EDM has been known as one of the indispensible micromachining techniques with obvious advantages of machining complex structures with high aspect ratios, high precision, and accuracy irrespective of workpiece material's hardness and toughness [2]. Choosing the most suitable machining parameters for manufacturing process is the essence of any manufacturing process, in order to make high quality parts at reduced cost for the best performance. An improper parameter selection directly affects the productivity, lead time and cost of the product. Generally, this can be carried out by relying heavily on the operator's experience or crisp technological data provided by the EDM machine manufacturers. The information given by the manufacturers is inadequate and also applicable for regular materials.

The work material used in this study is a Monel 400 alloy which is a most promising and commonly used nickel based alloys due their excellent corrosion resistance and toughness over a wide temperature range. Monel has been widely used in chemical industries, food processing industries, heat exchanger tubing, nuclear reactors, sub marine and ship propellers etc. [3]. Many studies have been carried out previously on optimizing process parameters in the domain of EDM by classical methods [4]-[6]. Multi Criteria Decision Making (MCDM) has found acceptance in areas of operations research and management science and the discipline has created several methodologies. Gadakh [7] presented techniques for order preference by similarity to ideal solution (TOPSIS) method for solving multiple criteria optimization problem in WEDM process. TIWARY [8] used combined approach of response surface methodology and fuzzy technique for order preference by TOPSIS for machining of titanium super alloys. In this study an effort has been taken to select optimum process parameters for making micro hole in a Monel metal specimen.

2. Taguchi Technique

The Taguchi technique integrated with experimental design has been significantly utilized in the different zones of engineering field to enhance the efficiency of the manufacturing processes [9]. Taguchi provides standardized methods for each of these DoE application steps. This method incorporated with unique design of orthogonal arrays to assess the impact of the entire process parameter space with only a minimum number of experiments [10]. The purpose of conducting an orthogonal experiment is to find the optimum level for each factor. The optimal process parameters obtained from the Taguchi method are insensitive to the variation of environmental conditions and other noise factors. However, originally, the Taguchi method was designed to optimize single-performance characteristics. Optimization of multiple performance characteristics is not straight forward and significantly more confused than that of single-performance characteristics. In this study to solve the multiple performance characteristics problems, the Taguchi method is coupled with TOPSIS.

A. TOPSIS Method

TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) is a unique and multiple criteria Decision making method to determine solutions from a limited set of alternatives. It is one of the MCDM methods and initially developed by Hwang and Yoon (1981), and further refined by Hwang, Lai and Liu in 1993[11]. The fundamental principle of

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Investigation of process parameters of AMEDM on Al/SiC composite using Taguchi approach

A. Ranjithkumar [a], C. Suresh [b], M. Eswaran [c], K. Rajasekar [d], U.M. Saravanan [d], T. Sathees Kumar [d]

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Abstract

The present study examines the abrasive mixed electrical discharge machining (AMEDM) of aluminium composites. Taguchi method has been used to optimize the material removal rate (MRR) and tool wear rate (TWR) considered as performance response for composite machining using AMEDM. In this analysis, boron carbide (B_4C) abrasive particles were mixed with different concentration to the kerosene oil that acts as a dielectric fluid (DF). It has been found that with the addition of B_4C powder, MRR is increased and TWR is decreased. Based on S/N ratio analysis, results showed that the MRR in machining of through holes with AMEDM on composites is significantly influenced by abrasive concentration and peak current. Concentration of abrasive particles has a significant impact on the TWR. Optimum process parameters are found based on S/N ratio analysis, For MRR, value are specified as pulse-on-time (A2) 120 μs, peak current (B3) 9 A, concentration of abrasive particle (C2) 10 gm/l and pulse-off-time (D2) 40 μs and for TWR, value are specified as pulse-on-time (A3) 150 μs, peak current (B2) 6 A, concentration of abrasive particle (C2) 10 gm/l and pulse-off-time (D3) 50 μs.

FEEDBACK

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Automatic Temperature Based Fan Controller using Thermistor

D. R. P. Rajarathnam[1], S. T. Kumaravel[2], A. Surya[3], M. Vinoth[4], V. Subash[5]
[1]*Professor & HoD, Department of Mechatronics Engineering, Pavia Engineering College, Namakkal, India*
[2]*Associate Professor, Department of Mechatronics Engineering, Pavia Engineering College, Namakkal, India*
[3,4,5]*Student, Department of Mechatronics Engineering, Pavia Engineering College, Namakkal, India*

***Abstract*: Over the last decade, advances in electronics have made devices smaller, cheaper and faster. This project is about how the speed of a fan can be controlled, based on temperature sensor. It is also a part of smart home application where the fan will gradually increase its speed if the temperature is increasing. In general, home appliance fans need to be operated manually with the help of regulators with the variation of temperature, thus requires a repeatedly extra effort for regulating the fan speed which acts to our agony. So as to reduce this extra effort and to add comfort, it is intended in this paper designing an "Automatic Temperature Controlled Fan". In this project the main intension is to control the fan by heating the sensor, i.e. the thermistor, where the speed of the fan is dependent and controlled by any device's temperature like PC. As the temperature of the device increases or decreases, the speed of fan increases or decreases respectively. So, it can be used mainly as a cooling device. By modifying the circuit slightly, it can also be used to control the room temperature, depending on the property of thermistor. The thermistor used in the circuit here, decreases its resistance with increasing temperature, hence the electrical conductivity also increases, increasing voltage across it, resulting in an increment in the speed of the fan. Thus, it is possible to control the speed of the fan automatically when the device's temperature varies. Experiment can be followed to evaluate whether this circuit can save energy through the use of temperature sensor and thus promote efficiency.**

***Keywords*: Temperature controlled fan, Thermistor**

1. Introduction

Electric fan is one of the most popular electrical devices due to its cost effectiveness and low power consumption advantages. It is a common circuit and widely used in many applications. It is also one of the most sensible solutions to offer a comfortable and energy efficient. In fact, the fan has been long used and still available in the market. Fan can be controlled manually by pressing on the switch button. Where in this method, any change in the temperature will not give any change in the fan speed. Except the usage change the speed of the fan which is manually. So, an automatic temperature control system technology is needed for the controlling purpose in the fan speed according to the temperature changes.

2. Methodology

The circuit presents the design, construction, development and control of automatic switching electric fan. The idea is based on the problem occurs in human's life nowadays by improving the existing technology. The Peripheral Interface Controller (PIC) based automatic fan system is applied to upgrade the functionality to embed automation feature. The electric fan will automatically switch on according to the environmental temperature changes. The circuit is using a microcontroller to control the fan according to the temperature variation. The system measures the temperature from the Integrated Circuit (IC) LM35, where it will control the fan according to the setting values in the programming.

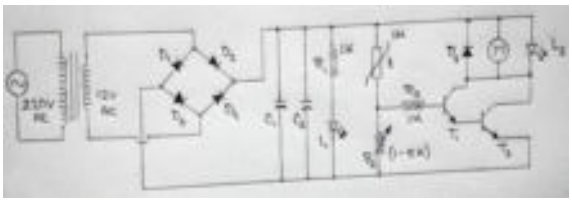

Fig. 1. Circuit diagram of a temperature-controlled fan

3. Fan speed control system components

The Arduino is the heart of the system. It accepts inputs from the temperature sensor, LM35 which allows for the measurement of the current room temperature, then the controller will give the action to maintain the required fan speed. LCD is used to display the fan speed and room temperature. All of these can be summarized in a diagram as shown in Fig. 2.

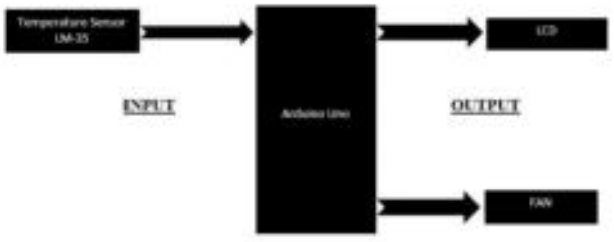

Fig. 2. Block diagram of fan speed control system

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Fabrication and Characterization of Basalt/Kevlar/Aluminium Fiber Metal Laminates for Automobile Applications

M.S. Santhosh[1], R. Sasikumar[2], T. Thangavel[3], A. Pradeep[4], K. Poovarasan[5], S. Periyasamy[6], T. Premkumar[7]

[1] *Junior Research Fellow, Selvam Composite Materials Research Laboratory, Tamilnadu, India.*

[2] *Professor & Director Research, Selvam College of Technology, Tamilnadu, India.*

[3] *Assistant Professor, Mechanical Department, Paavai Engineering College, Tamilnadu, India.*

[4, 5, 6, 7] *UG Scholars, Mechanical Department, Paavai Engineering College, Tamilnadu, India.*

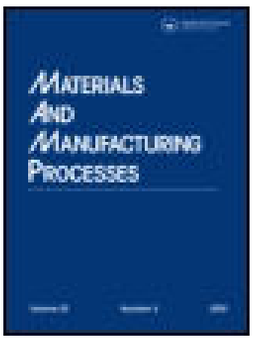
Abstract

Sandwich fiber metal laminates (FMLs) grabs significant growing attention among disparate engineering industries such as defense, aerospace and commercial vehicle manufacturers, due to its improved mechanical, thermal and electrical properties. Over the past few decades, FMLs were used as an impeccable identical for classical fiber composites like carbon and E-Glass. This prospective work interrogates mechanical behaviour of Basalt/Kevlar/AA 8090 reinforced FML fabricated by hand layup - compression moulding process. The low-velocity impact, flexural and tensile behavior of fabricated FMLs were calculated by various mechanical testings done as per ASTM standards. Fractured surface of the FML also analyzed by scanning electron microscopic images for understanding the fracture behavior of the proposed outcome.

Keywords: Fiber metal laminate, Basalt, Kevlar, Al 8090, Flexural, Low velocity impact, compression moulding.

1. INTRODUCTION

Fiber reinforced composites has a significant impact in production of engineering materials. It occupies huge percentage in the total fabrication due to its admirable mechanical properties like strength to weight ratio and cost-effectiveness. Recent researchers focusing on use fiber reinforced metal laminates for various automobile



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Effect of electrode heating on performance of electrochemical micromachining

S. Maniraj & R. Thanigaivelan

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TECHNICAL PAPER

Optimization of Electrochemical Micromachining Process Parameters for Machining of AMCs with Different % Compositions of GGBS Using Taguchi and TOPSIS Methods

S. Maniraj[1] · **R. Thanigaivelan**[2]

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Abstract In recent years, the application of aluminum metal matrix composites is expanding to various fields like aerospace, automobile and other industrial machineries. This paper presents the machinability of ground-granulated blast furnace slag (GGBS)-reinforced aluminum 6061 metal matrix composites using electrochemical micromachining for material removal rate (MRR) and radial overcut (ROC). Input voltage, duty cycle, electrolyte concentration and % of composition are selected as the input process parameters. Experiments have been investigated using the L_{18} mixed-level orthogonal array, and process parameters are optimized using Taguchi technique. The model equation for MRR and ROC is developed using regression analysis. Analysis of variance is performed, and the most significant factor is found to be percentage (%) composition of GGBS. Additionally, the multi-criteria decision-making technique has been used to find optimal machining parameters for higher MRR and lower ROC. The optimal combination for higher MRR and lower ROC is 10 V, 50%, 35 g/l and 12% of GGBS composition. The confirmation test has been carried out to validate the results, and the obtained optimal parameter levels are very close to an ideal solution.

Keywords Electrochemical micromachining (EMM) · Material removal rate · Radial overcut · Aluminum composites · TOPSIS

✉ S. Maniraj
maniraj4016@gmail.com

[1] Mechanical Engineering, Paavai Engineering College (Autonomous), Pachal, 637018 Namakkal (Dt), India

[2] Mechanical Engineering, Muthayammal Engineering College (Autonomous), Rasipuram, 637408 Namakkal (Dt), India

1 Introduction

Current applications of engineering require materials that are cheap, stronger and lighter in weight. AMCs are noted to supply such tailored property materials required in the field of engineering applications. AMCs are rapid replacement of conventional metallic alloys in many applications as their uses are extended predominantly from automobile, aerospace and defense industries [1]. Aluminum remains as the foremost utilized metallic alloy as material matrix in the development of MMCs, and also the reasons for this have been reported. In the same way, the intrinsic worth of using whiskers or discontinuous ceramic particulates over continuous ceramic fibers for manufacturing AMCs is given in the literature. On the other hand, an inadequate supply of ceramic reinforcing materials in a particular developing country has remained a serious drawback related to the event of discontinuously strengthened AMCs [2]. Research efforts have a place in situation to resolve these troubles for the proper selection of reinforcing materials. Often the reinforcing materials play the key role in determining the performance of an MMC. GGBS is utilized as a reinforcement material with Al6061 T6 with 6%, 9% and 12% composition. The greater part of the non-traditional micromachining processes is thermal oriented, e.g., electron beam machining (EBM), laser beam machining (LBM) and electrodischarge machining (EDM) which produces thermal deformation in machined component. Electrochemical machining and also chemical machining processes are thermal-free processes, but chemical machining is applicable only for chemically conductive material. Electrochemical machining (ECM) processes play a significant role in the fabrication of microcomponents because of their advantages such as higher MRR, no tool wear, good surface finish and better

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Measurement and multi-response optimization of turning parameters for magnesium alloy using hybrid combination of Taguchi-GRA-PCA technique

R. Viswanathan [a,*], S. Ramesh [b], S. Maniraj [c], V. Subburam [c]

[a] Department of Mechanical Engineering, Pallavi Engineering College, Hyderabad, India
[b] Department of Mechanical Engineering, Presidency University, Bengaluru, India
[c] Department of Mechanical Engineering, Paavai Engineering College, Namakkal, India

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ABSTRACT

The requirement for magnesium alloys has been rising constantly over the years because of the thrust towards weight reduction in various fields that demand fuel-efficient automobile, low-priced electronics, hand-held compact devices and biodegradable medical implants. Hence machinability studies of magnesium alloys contribute significantly to use them in appropriate applications. The present work is aimed to investigate the cutting force (Fz), material removal rate (MRR), tool flank wear (V_B) and surface roughness (Ra) in turning of magnesium alloy with physical vapour deposition (PVD) coated carbide insert in dry conditions. The tests were carried out on the basis of the orthogonal array of Taguchi's L_{27}. To identify the optimal parameters setting, a combination of principal component analysis (PCA) and grey relational analysis (GRA) has been conducted. From the analysis of variance, it was revealed that depth of cut is the significant contributing parameter on this multiple performance characteristics process.

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1. Introduction

Magnesium's utilization is rising extensively in a variety of industrialized applications because of the advantage of low density. The aforesaid characteristic makes it appropriate to use wherever the intent is weight reduction. Due to its favourable properties, magnesium finds applications in different fields like medicine, sports, electronics, automobile, household equipment, aerospace etc., [1,2]. Nowadays weight reduction has become a main objective in automobile sector to reduce fuel consumption and decrease green house gas emissions [3,4].

Magnesium and its alloys possess many attractive machining properties (relatively lesser power required) compared to other structural materials (e.g., mild steel, aluminium, stainless steel and cast iron) [5]. The chip ignition is the most important disadvantage involved in the machining of magnesium alloy. During machining, magnesium chips easily get autoignited and hence water based lubricant is not suitable here as it would chemically react with Mg [6–10].

Carou et al.[11] investigated intermittent Mg alloy turning with dry and minimum quantity lubrication conditions with low cutting speeds which has given discontinuous and short chips. Rahman Rashid et al. [12] have assessed the impact of laser assisted machining (LAM) and conventional machining (CM) on AZ91 magnesium alloy. It is stated that small, flake-like chips were obtained under both conditions. The feed force and the Fz were decreased to 7.5% and 15% respectively compared to conventional machining at 275 m/min cutting speed in this study.

Carou et al. [13] evaluated the chip morphology in the intermittent Mg alloy turning under dry condition and varying other cutting conditions with cemented carbide tool. In this study no obvious predominant form could be observed for the chips and the chips generated were elemental and spiral chips. Dinesh et al. [14] have done turning on ZK60 wrought magnesium alloy under dry and cryogenic conditions and concluded that the Ra increases with a higher feed rate under both conditions. In turning of AZ91 Mg alloy, Tomac and Tonnessen [15] used a carbide tool to evaluate the significance of cutting speed and flank build up. Higher tool wear and poorer surface quality were observed for cutting fluids used at medium and low cutting speed conditions.

Lu et al. [16] have done turning on AZ31 Mg alloy to examine the significance of cutting factors on the Ra under high cutting speed. The roughness is decreased when the cutting speed increases, because of the reduction in Fz, which improves the surface quality of the specimen. When depth of cut increases, the

* Corresponding author.
E-mail address: vissona2005@yahoo.co.in (R. Viswanathan).

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Enhancing the fuel properties of tyre oil diesel blends by doping nano additives for green environments

S.T. Kumaravel [a, *], A. Murugesan [b], C. Vijayakumar [c], M. Thenmozhi [d]

[a] Department of Mechanical Engineering, Paavai Engineering College, Namakkal, 637018, Tamilnadu, India
[b] Department of Mechanical Engineering, K.S.Rangasamy College of Technology, Tiruchengode, 637215, Tamilnadu, India
[c] Department of Mechatronics Engineering, K.S.Rangasamy College of Technology, Tiruchengode, 637215, Tamilnadu, India
[d] Department of Biotechnology, Selvam College of Technology, Namakkal, 637003, Tamilnadu, India

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ABSTRACT

The waste tyres are deposited in landfills; it will cause severe health problems to human. To overcome this problem the present work is focused on converting waste tyre into oil and finding fuel properties towards clean environment by waste management. First the tyre oil blends 5%, 10%, 15% and 20% by volume with diesel and without cerium oxide nano additives are taken. The properties of the blends are tested as per the american society for testing and materials (ASTM) standard. Heating value, density, viscosity, flash and fire point have been measured for the above tyre pyrolysis oil and diesel blends. The experimental results shows the viscosity, density of all fuel blends are higher than diesel and flash & fire point, calorific value of all fuel blends are lower than diesel. In such a case cerium oxide nano additive was doped with tyre pyrolysis oil of 5%, diesel of 90% with cerium oxide nano additives 50 ppm (B5D90 + CeO_2 50 ppm), tyre pyrolysis oil of 5%, diesel of 85% with cerium oxide nano additives 100 ppm (B5D85 + CeO_2 100 ppm), tyre pyrolysis oil of 10%, diesel of 85% with cerium oxide nano additives 50 ppm (B10D85 + CeO_2 50 ppm) and tyre pyrolysis oil of 10%, diesel of 80% with cerium oxide nano additives 100 ppm (B10D80 + CeO_2 100 ppm) using solgel process, then all the fuel properties are increased compared to without nano additive blends. The experimental result shows the B5D85 + CeO_2 100 ppm the value comparative to diesel. The morphological and structural studies of cerium oxide (CeO_2) nano additives were illustrated by (XRD), scanning electron microscopy (SEM) and Fourier-transform infrared spectroscopy (FTIR). The Gas chromatography–mass spectrometry (GC-MS) and stability analysis was carried out for a prepared fuel. However, B5D85 + CeO_2 100 ppm were found to have higher brake thermal efficiencies, higher NO_X along with lower smoke emissions in association to diesel operation where also discussed in this paper. The discussion was directed by the dual reason of dropping the environmental impacts, though ahead of economical sustainability. These properties, environmental impact and financial viability reveals that the tyre pyrolysis diesel blends doped with CeO_2 nano additives is a most affordable alternative fuel for compression ignition (CI) engine towards clean environments.

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1. Introduction

Unrecycled waste tyre is a colossal worldwide issue in view of their non-biodegradability, their combustibility and their chemical compositions that prompts filtering of poisonous substances into the ground on dumping and unsafe exhaust on burning. The emissions from vehicles playing a role in the clean environment of the country. The tremendous growth of vehicles and human population has resulted in would like of energy demand (Vijayakumar et al., 2016). Because of this energy demand and also rapid diminution of hydrocarbon fuels, researchers are concentrated on to replace the appropriate environment friendly fuel for diesel (Rofiqul Islam et al., 2008). Alternative fuels for diesel engines became very important because of increase in energy expenditure, satisfies the demanding norms of emission, fluctuating price of the crude oil merchandise in Asian country.

The transportation section acting as a mainly significant job in

* Corresponding author. Department of Mechanical Engineering, Paavai Engineering College, Paavai nagar, NH-7, Pachal, Namakkal, 637018, India.
E-mail address: kumaravelthangavelu@gmail.com (S.T. Kumaravel).

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SUSTAINABLE ENERGY

ENVIRONMENTAL PROGRESS & SUSTAINABLE ENERGY

Experimental investigation on engine performance, emission, and combustion characteristics of a DI CI engine using tyre pyrolysis oil and diesel blends doped with nanoparticles

Kumaravel Thangavelu S[1] | **Murugesan Arthanarisamy**[2]

[1]Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India

[2]Department of Mechanical Engineering, K. S. Rangasamy College of Technology, Tiruchengode, Tamilnadu, India

Correspondence
Kumaravel Thangavelu S, Department of Mechanical Engineering, Paavai Engineering College, Paavai nagar, Pachal, Namakkal, Tamilnadu, India.
Email: kumaravelthangavelu@gmail.com

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Abstract

This article investigates the utility of waste tyre oil as a potential source of partial replacement of diesel fuel. The experimental study of engine parameters such as performance, emissions, along with combustion characteristics of tyre oil blends with cerium oxide (CeO_2) and without CeO_2 nano additive in a four-stroke single-cylinder water-cooled compression ignition engine was conducted without any engine adjustment. Tyre oil was blended with diesel fuel at the volumetric proportions of 5, 10, 15, and 20%. These experimental results reveal that B5 blend has increased Brake thermal efficiency compared to other blends and nearer to diesel fuel at full load. The emissions of Hydrocarbon (HC), smoke are lower than diesel fuel by 3, 3.22% for B5 blend of full load. If CeO_2 nano additives are doped with tyre oil blends in such case the B5D85 + CeO_2 100 ppm blends were increased in efficiency of 2.85% and emissions like HC, CO, Smoke are decreased by 3, 1.33, 7.7%, respectively compared to diesel. From the experimental results, B5D85 + CeO_2 100 ppm fuel blend is the best fuel ratio for a CI engine for increased efficiency, reduced emission and better combustion. Hence, the tyre oil with CeO_2 nano additives is a suitable alternative fuel for CI engine.

KEYWORDS
atmospheric emissions, combustion, nanoparticles, pyrolysis

1 | INTRODUCTION

Diesel engines are the best machines which change over chemical energy of fuel into mechanical energy. Because of the expansion in energy request and the exhaustion of fossil fuel saves, researchers have concentrated on discovering alternate fuels, that is, biodiesel,[1] microalgae and so onward for diesel engines.[2] Diesel is one of the additional of nonrenewable energy source utilized in the transportation segment in India, diesel fuel utilization comprises around 49% of the oil-based commodities used in the nation. Utilization has been developing relentlessly at a yearly rate of around 5%.[3] Diesel would able to view as an imperative derivate of a petroleum product to the economy. Supplanting petroleum, resulting diesel with other sources will have an immense positive effect on the amount of petroleum derivatives imported into the nation and along these lines save the countries outside cash saves. Draining nonrenewable energy source holds and expanding cost of the oil-based goods are the enormous inconveniences of the present world. A huge amount of dollars are

ABBREVIATIONS: ASTM, American society for testing and materials; B 10, tyre pyrolysis oil by 10% with diesel of 90%; B 15, tyre pyrolysis oil by 15% with diesel of 85%; B 20, tyre pyrolysis oil by 20% with diesel of 80%; B 5, tyre pyrolysis oil by 5% with diesel of 95%; B10D80 + CeO_2 100 ppm, tyre pyrolysis oil of 10%, diesel of 80% with cerium oxide nano additives 100 ppm; B10D85 + CeO_2 50 ppm, tyre pyrolysis oil by 10%, diesel by 85% with cerium oxide nano additives 50 ppm; B5D85 + CeO_2 100 ppm, tyre pyrolysis oil by 5%, diesel by 85% with cerium oxide nano additives 100 ppm; B5D90 + CeO_2 50 ppm, tyre pyrolysis oil by 5%, diesel by 90% with cerium oxide nano additives 50 ppm; BSEC, brake specific energy consumption; BTDC, before top dead centre; cc, cubic centimeters; CeO_2, cberium oxide; CI, compression ignition; CO, carbon monoxide; CO_2, carbon dioxide; DI, direct injection; HC, hydrocarbon; HRR, heat release rate; IC, internal combustion; kW, kilowatt; min, minutes; NO_X, nitrogen oxides; ppm, parts per million; rpm, revolutions per minutes; TDC, top dead centre; TPO, tyre pyrolysis oil.

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Enhancement of material removal rate in EDM process using silicon carbide based strenx 900 steel

S. Marichamy [a], S. Maniraj [b,*], R. Thanigaivelan [c], S.T. Kumaravel [b], K. Vinoth Babu [a], P. Mallesham [a]

[a] Department of Mechanical Engineering, Sri Indu College of Engineering and Technology, Hyderabad, Telangana, India
[b] Department of Mechanical Engineering, Paavai Engineering College (Autonomous), Namakkal, India
[c] Department of Mechanical Engineering, Muthayammal Engineering College (Autonomous), Namakkal, India

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ABSTRACT

Material removal rate (MRR) plays an important role in metal industries. Its mainly depends on hardness, strength and toughness of the material. Light hardness materials are easily machined by conventional machining processes. High hardness materials are easily machined by unconventional machining processes. Electrical discharge machining (EDM) process is one of the effective methods to machine very hard materials. To achieve high material removal rate in very hard material is difficult and it takes more time. The silicon carbide-based strenx 900 steel is used as work material for this experimental investigation. The material removal rate has enhanced by modification of electrical circuit, powder mixed dielectric fluid and install oxygen arrangement. These additional facilities are used to improve the machinability characteristics and tool life of the EDM process.
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1. Introduction

The strenx 900 is a high-strength structural steel and wear resistant steel which is used to many applications like as building construction, bridge works and railways. It consists of various alloying elements such as silicon, titanium, chromium, vanadium and manganese. These alloying elements are used to improve the material properties of the strenx steel. In recent years electrical discharge machining process is used in many fields such as aerospace, automobile, tool and dies [1]. In EDM process, material is removed through electrical discharge produced in between tool and work piece [2]. To enhance the material removal rate, silicon particles and graphite powders are mixed in to the dielectric fluid [3,4]. The discharge energy and pulse duration mainly depends on variation of electric resistance [5]. The material rate has been increased by the charged powder particles [6]. The various effects on material removal rate has been studied in EDM using Water and Powder-Mixed Dielectric Fluid [7]. Material removal rate was analyzed in EDM process using EN-31 steel [8]. Material removal rate is analyzed with different tool materials in heat treated steel [9]. The dual phase brass material is machined by EDM process and the effect of material removal rate was discussed [10] (Table 1).

In present investigations clearly discuss about an enhancement of material removal rate through additional supply of oxygen, modification of electric circuit and powder mixed dielectric fluid in EDM process using silicon carbide based strenx 900 steel.

2. Experimental methodology

The strenx 900E steel with silicon carbide is fabricated through stir casting method. The silicon carbide particles are used as a reinforcement material (6 wt% of SiC). The above 6 wt% of reinforcement SiC provides non uniform material structure [11]. The material properties are evaluated before and after addition of silicon carbide particles. After that, the material is machined by EDM process. The performance of material removal rate is measured by before and after modification of EDM process. The enhancement of material removal rate is measured in the modification of EDM circuit and provides oxygen supply. FD7125 Model, Berlin Machine Corporation made EDM was used.

3. Result and discussion

3.1. Enhancement of material removal rate

EDM is used for machining advanced materials and widely used in various industries [13].The strenx 900E was considered as a

* Corresponding author.
E-mail address: maniraj4016@gmail.com (S. Maniraj).

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Role of AMPK signaling in Repigmentation- An Insilico study

M.Thenmozhi[1*], A.Murugesan[2] S.T.Kumaravel[3]

[1]*Assistant Professor, Department of Biotechnology, Selvam College of Technology, Tamil Nadu, India.*
[2] *Professor, Department of Mechanical Engineering, KSRangasamy College of Technology, Tamil Nadu, India.*
[3]*Assistant Professor, Department of Mechanical Engineering, Paavai College of Engineering, TamilNadu, India.*

**Corresponding author E-Mail ID: thenmozhimsel@gmail.com*

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ABSTRACT

Vitiligo is an epidermal disorder causes depigmented patches resulted from the loss of melanocytes, Autoimmunity hypotheses strongly supports that the immune system compartments responsible in the development of vitiligo. Adenosine MonoPhosphate kinase (AMPK) signaling plays a role in regimentation in vitiligo. In this present study, set of ligands selected to dock against AMPK protein in the AMP binding site using FlexX software. Based on the scores and protein-ligand interactions selected ligands were analyzed for its binding affinity and protein ligand stability for its further drug development process.

Keywords: Vitiligo, autoimmunity, AMP, AMPK,

1. INTRODUCTION

Vitiligo is a rare and chronic autoimmune disease in which the body attacks its own melanocytes in the epidermis, causing depigmentation in irregular patches of skin and hair. Vitiligo affects 0.5-2% of the world population [Ray *etal*., 1994]. Currently there is no cure for Vitiligo. These with the disease often use topical creams and concealers to diminish the appearance of depigmented patches. Those with severe cases have sometimes resorted to skingrafts and photo therapies. Corticosteroids have been used in the treatment of vitiligo since 1970[Doghim *etal.*,2011].

ransrepression of NF-kB leads to suppression of immune system. Physical interaction between GR and p-65 subunit of NF-kB leads to inactivation of NF-kB. Because N-terminal of p-65 subunit has the strong capacity for transactivating potential of NF-kB. Interaction between N-terminal subunit p-65 and two critical aminoacids in the C-terminal zinc finger leads to the inactivation of NF-kB results to down regulate the immune system [Liberman *et al.*,2007].

AdenosineMonophosphateprotien kinase (AMPK) signaling mediates many cellular processes. From all AMPK signaling activation leads to Nf-kB deactivation, it helps in autoimmunity suppression in vitiligo patients. As well as imbalance of glucose uptakes found in vitiligo patients, high glucose levels inactivate AMPK so using AMPK activators helps to improve glucose metabolism it helps in repigmentation (Viollet.B *et al.*,2009, 2011).

In this present study set of 6 ligands which are as follows Ascorbic acid, Berberine, Chrysin, Kaempferol, Pinocembrine, Piperine allowed to binding in the AMP binding site and also AMP allowed to binding in the AMP binding site then compare the results (scores) of all the 6 compounds with AMP result (score). There were no docking studies carried out to study the protein-ligand stability based on the scores for AMPKinase with these set of ligands.

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Gesture Control Car Controlling System Using PIR Sensor

D. R. P. Rajarathnam[1], S. T. Kumaravel[2], R. Praveen Kumar[3], N. Kavi Praveen Kumar[4], P. Magendran[5]

[1]*Professor & HoD, Department of Mechatronics Engineering, Paavai Engineering College, Namakkal, India*
[2]*Associate Professor, Department of Mechatronics Engineering, Paavai Engineering College, Namakkal, India*
[3,4,5]*Student, Department of Mechatronics Engineering, Paavai Engineering College, Namakkal, India*

***Abstract*: The goal of gesture recognition in Computer Science field has always been the minimization of the distance between the physical world and the digital world. The way humans interact among themselves could be implemented in communication with the digital world by interpreting gestures via mathematical algorithm. Numerous ways and algorithms have been proposed and implemented to achieve the goal of gesture recognition and its use in communicating with the digital world. Gestures can be tracked using accelerometers. Since modern Smartphone are equipped with an in-built accelerometer, gesture control using Smartphone can be easy to implement, cheap to provide and the output will be more intuitive. This paper deals with the design and implementation of a wireless gesture controlled Robot using Arduino Lilypad processor and an Android operated application to control the gestures with minimal, and cheap hardware requirements. The system can be broadly classified into two components: The Hardware part consisting of Arduino Microcontroller, the Adafruit motor Shield, HC-05 Bluetooth module, and the Android Smartphone, and the software part consists of a Java based application run on android.**

***Keywords*: microcontroller, accelerometer, gesture recognition, embedded systems, android, module, motor driver, co-ordinates, robot.**

1. Introduction

Humans interact in the physical world by the means of the five senses. However, gestures have been an important means of communication in the physical world from ancient times, even before the invention of any language. In this era of machines taking control of every complex works, interactions with machines have become more important than ever. Robots are classified into two types: Autonomous robots like Line sensing or edge sensing robots, and Remote controlled robots like Gesture controlled Robots. Since this paper deals with gesture controlled robot, the primary focus will be on the remotely controlled robots only.

Undoubtedly, the output and the functioning of machines will be more intuitive if they are communicated using human gestures. A gesture is a form of communication in a non-verbal manner by using visible body movements or actions conveying messages.

There are several ways to capture a human gesture that a machine would be able to understand. The gesture can be captured using a camera, or a data glove. Gestures can also be in infrared waves, Acoustic, Tactile, optical or motion technological means [1]. The embedded systems designed for specific control functions can be optimized to reduce the size and cost of the device, and increase the reliability and performance. The Gesture are equipped with in-built accelerometer which may be used for gesture recognition and such other tasks. Moreover, Android platform is being used in the development of numerous applications for cellphones.

Researchers have shown interest in gesture recognitions and have built several robots and devices that are controlled by human gestures. There is a constant development in the field of gesture controlled devices. Apart from hand gesture recognition, emotional gesture recognition from face is also done in some cases. There are two types of gestures used in gesture recognition: Online gestures and Offline gestures. In Online gestures, direct manipulations like rotation and scaling are done. In Offline gestures, the processing is done only after the user interacts with the object. Gesture technologies are applied in several fields like in Augmented Reality, Socially assistive Robots, recognition of sign languages, emotion detection from facial expressions, Virtual mouse or keyboard, recognition of sign languages, remote control, etc.

There are various modes of communication between the microcontroller of the robot and the Smartphone. However, the popularly used means of communication is done via RF, Bluetooth or Wi-Fi. Using RF limits the distance from which the robot can be controlled. Using Wi-Fi increases the overall cost for setup. So, the robot has been built with Bluetooth which has intermediate range of distance covered and cost between RF and Wi-Fi. Arduino to detect the direction of movement of the user's hand and move the robot accordingly. The prime aim of the design is that as the user moves his hand in some direction, the robot moves in the same direction as well. In other words, the robot is solely controlled by the hand movements and gestures of the user. The goal of this paper is to develop a method to control and program a robot with gestures and assure high level of abstraction, cheap and minimal hardware and a simplified robot programming.

Design and Analysis of Emergency Rescue Vehicle

R.karthick[1] S.Dhayananathan[2] P.Deepanraj[3] C.Dharunkumar[4] P.Esaiarasu[5]
[1]Assitant Professor [2,3,4,5]U.G Scholar
[1,2,3,4,5]Paavai Engineering College, Namakkal, India

Abstract— Traffic accidents are a result of the convergence of hazards, malfunctioning of vehicles and human negligence that have adverse economic and health impacts and effects. Unfortunately, avoiding them completely is very difficult, but with quick response to rescue and first aid, the mortality rate of inflicted persons can be reduced significantly. Smart and innovative technologies can play a pivotal role to respond faster to traffic crash emergencies comparing conventional means of transportation. For instance, Rescue Emergency Drone (RED) can provide faster and real-time crash site risk assessment to emergency medical services, thereby helping them to quickly and accurately assess a situation, dispatch the right equipment and assist bystanders to treat inflicted person properly. To conduct a research in this regard, the case of a traffic roundabout that is prone to frequent traffic accidents. Emergency Disaster Management Simulation (EDMSIM) has been used to verify the response time of RED from a fire station of the town to the presumed crash site. The results of the study demonstrate the robustness of RED into emergency services to help save lives.

Keywords: Rescue Emergency Drone, Emergency Disaster Management Simulation

I. INTRODUCTION

One of the leading causes of non-natural deaths in the world is traffic accidents. According to statistics of the World Health Organization, in recent years almost 1.25 million people lost their lives worldwide due to traffic accidents, while as many as 20-50 million people suffered injuries, and unfortunately many of them are disabled for rest of their lives.

In the event of a traffic accident, it is vital that a seriously injured person receive medical attention within minutes of the event. Emergency management services need to be well prepared to provide immediate medical help to save lives and enable that person to contribute to the welfare of society again. Some medical experts term the first 60 minutes as the "golden hour" in trauma injuries and emergency medical service (EMS).

It is important to note that average response time to emergencies in the European Union is 10 minutes. And the first 10 minutes according to some experts are termed as 'Platinum Time' in response to accidents.

Though every injured person's severity of injury and initial medical treatment, along with the minimum time required to save their life may differ, achieving this minimum time is crucial. However, a severely injured person suffering either a brain or chest injury must be treated within first few minutes. For example, a cardiac arrest victim must be given first aid within 3-5 minutes, as failure to be treated within this time reduces the chances of survival to as low as 8%.

II. APPLICATION OF RED FOR RESCUING INJURED PERSONS

For the application of an appropriate RED, we considered a system that is either being used or developed for emergency and rescue purposes. The following four RED are considered.

- Camcopter S-100
- Aeryon Lab's Sky-Ranger
- DJI Phantom 4
- Drone Ambulance

Fig. 1: Camcopter S-100

Fig. 2: Aeryon Lab's

Fig. 3: DJI phantom 4

Fig. 4: Drone ambulance

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Radar Guided Missile System

D. R. P. Rajarathnam[1], R. T. Ajay Karthik[2], V. Ajith Kumar[3], J. Manivasagam[4], R. Manoj Kumar[5]
[1]*Professor & HoD, Department of Mechatronics Engineering, Paavai Engineering College, Namakkal, India*
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[3,4,5]*UG Student, Department of Mechatronics Engineering, Paavai Engineering College, Namakkal, India*

***Abstract*: The aim of our project is to design a missile launcher which is controlled by the signals from a RADAR. The working is based on Arduino Uno, Servo motor, Ultrasonic sensor. The idea is to first code the entire working using our previous knowledge of programming. The code will then be simulated on software and later be interfaced with the hardware or Arduino Uno. The ultrasonic sensor movement is maintained by the servo motor fixed within it. The servo motor is made to revolve through fixed angles; if object is detected then the angle position is sent as the input to the launcher fixed servo motor. The launcher will release the missile fixed within it. This project will play an important role in defense purposes.**

***Keywords*: Arduino Uno, Ultrasonic sensor, Servo motor**

1. Introduction

RADAR is an object detection system which uses radio waves to determine the range, altitude, direction, or speed of objects. Radar was secretly developed by several nations before and during the World War II. The term RADAR itself, not the actual development, was coined in 1940 by United States Navy as a crony for Radio Detection and ranging. The modern uses of radar are highly diverse, including air traffic control, radar, astronomy, air defence systems, antimissile systems, antimissile systems; marine radars to locate landmarks and other ships; aircraft anti-collision systems; ocean surveillance systems, outer space surveillance. A radar system is the heart of a missile guidance system.

Our main aim of developing this project is to make the automated missile launching devices which is highly helpful in defence technology and surveillance in upcoming years. These launching vehicles can be used in army supported with tankers and other vehicles, used in navy by supporting with ships, and used in aircraft by installing it in air-crafts. These launchers will be actuated if there is any interruption in the radar signals.

2. Literature survey

Different types of researches have been made by different researchers in developing this type of project. However, they have a different application and have different technologies implemented. Some of those papers are mentioned below stating their technology and application. “The Idea” Army, Navy and the Air Force make use of this technology. The use of such technology has been seen recently in the self-parking car systems launched by AUDI, FORD etc. And even the upcoming driverless cars by Google like Prius and Lexus. This setup can be used in any systems the customer may want to use like in a car, a bicycle or anything else. The use of Arduino in this provides even more flexibility of usage of the above-said module according to the requirements.

D. A. Ghoghre [1], Ahire Dhanshri, Ahire Priyanka, have presented the radar system which is used for only object detection, and can be implemented for surveillance only and not available in defence technology.

Srijan Dubey [2], Supragya Tiwari and Sumit Roy, have performed an object detection system with the help of ultrasonic sensor and published “Implementation of Radar using Ultrasonic Sensor”, this system is used for detecting objects in an open surface and provide alarming system to indicate the interference of objects. This is a surveillance system which can able indicate.

Kadam D. B. [3], Patil Yuvr J. B., Chougale Krishna V., Perdeshi Swagat S., have published “Arduino Based Moving Radar System”. This system is based on making a vehicle which is moved automatically by the signals of the ultrasonic sensor, controlled by the Arduino Uno processor and its software commands.

Sanjeev Kumar Verma [4], Sudhir Sing Badhuriya, and Saleem Akhtar, have worked on material analysis and non-destruction technology with the help of ultrasonic sensor and many types of material analyzing tools and different materials. Pamfil Somadiag [5]., He has designed “Air and Ballistic Missile Defense Systems LTC.” This system is used to launch the missile with the help of air through ballistic missile launching vehicle. These systems are designed to provide low cost in defence technology, but it has low efficiency than other system and needs proper maintenance.

T. V. Karthikeyan., A. K. Kapoor [6]., Scientists Defence Research and Development laboratory, Hyderabad, have published paper on “Guide Missiles”. They have worked on the team of human controlled and semi-automatic missile launching devices. They tell about computer controlled and automated missile system which is highly actuated by huge power systems, however these systems needs human interface or help while locking the target to be attacked. Bo Zhang [7], Zhou Wang and Tao Wang, Publishedon the topic of “Research on Movement Characteristics of Launching Mechanism of Portable Missile”. They have studied about the

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Paper on Hybrid Vehicle Parking System

M. Praveenkumar[1] M. Thirumoorthy[2] M. Vairamuthu[3] R. Arun Babu[4] D. R. P. Rajarathnam[5]
[1,2,3,4,5]Department of Mechatronics Engineering
[1,2,3,4,5]Paavai Engineering College, Namakkal, India

Abstract— The aim of our project is to design a hybrid vehicle parking system. The working is based on Android OS, Arduino uno, L298N motor drivers, HC-05 Bluetooth module. This is a very simple remote controlled system, with an Arduino and Bluetooth module. The idea is to first code the entire working using our previous knowledge of programming. The code will then be simulated on software and later be interfaced with the hardware. The controlling remote can be any smart device with android. All the controls of the vehicle will be on the app on that device. We chose this for our major project to overcome parking problems in everyday lifestyle and also have a wide scope in the engineering field. It plays a vital role in the development of new technology.

Keywords: HC-05 Bluetooth Module, Smart Phone, Arduino Uno, 150 rpm DC Motors, Vehicle Chassis, 12V Battery, Mobile Controlling Car

I. INTRODUCTION

Smartphone has quite changed the traditional ways of human to machine interaction. Smartphone is now a vital part of a person's life. Android is a software platform for mobile devices that includes an operating system, middleware and key applications. Android is a safe and secure operating system. Now a day's various applications are developed in play store.

Our main objective of writing this paper is to develop a parking system in all automobiles by controlling the system using Bluetooth. Bluetooth is used for its various advantages over other wireless technologies. Hardware technology utilized in smart phones has also greatly improved. Hence, we can say that Android smartphones will serve a great benefit for industrial, commercial and other general purpose applications.

II. LITERATURE SURVEY

Different types of researches have been made by different researchers in developing this type of project. However, they have a different application and have different technologies implemented. Some of those papers are mentioned below stating their technology and application.

Sudip kachhia [1], presented a 360 degree rotating vehicle to overcome the problem of parking space. This project is about design of 360 degree rotating car to move in all direction. This design provides better comfort and also saves the time of customers, that's why it is also the reliable for the customer. As it is also battery operated car thus no fuel is required. Hence it is economical to the environment. This also reduces the cost of the car, and also got idea to use battery to operate this vehicle.

Arunkumar S M, Chandan Kumar Sahu, Yubaraj G M,Jahangeer A B[2], proposed a system of consist of steering, chain sprocket, DC motor, wheel, bearing, iron pipe, battery and chain drive. In this system first the vehicle is stopped and wheels are then turned in the required direction with help of steering system and DC motor. For the forward and backward movement of this vehicle, DC motors are used in wheel and a battery is used to provide electrical energy for the DC motor. It has turning radius nearly equal to negligible of length of the vehicle itself. This system is to be useful in hospitals, small industries and also on railway platforms.

Mr. Amitesh Kumar [3], presented zero turn four wheel steering system, the various functions of the steering wheel are, to control the angular motion the wheels, direction of motion of the vehicle, to provide directional stability of the vehicle while going straight ahead, to facilitate straight ahead condition of the vehicle after completing a turn, the road irregularities must be damped to the maximum possible extent. This project the use of steering is to rotate front wheels.

Mr. Sharad P. Mali[4], presented zero turn four wheel mechanism, in this project people have used DC motor and wheel to vehicle rotate 360 degree at a same position. So in this project, the idea is to arrange of DC motor and wheel. A.A Kamble, A Dehankar[5], discusses fusion of AVM and ultrasonic sensor, used to detect the vacant parking slot in the automatic car parking system. The AVM provides a virtually 360 degree scene of the car in bird's eye view. The AVM helps the driver to maneuver into parking spots. Through the bird's eye view, a driver can check for obstacle around the vehicle. First, the parking slot marking detected in the AVM image sequence. A tree structure-based method detect the parking slot marking using individual AVM image sequence and image registration technique. Second, empty slot is detected using ultrasonic sensors. The probability of parking slot occupancy is calculated utilizing ultrasonic sensor data acquired while the vehicle is passing by parking slots, and finally the selected empty slot is tracked and the vehicle is properly parked in selected parking slots.

D.J.Bonde[6], uses the android application generates automatic parking and un parking with the help of commands of an android application. The system reduces the human intervention to the minimum by automating the process of car parking. When we visit various public spaces like shopping malls, five star/seven star hotels, multiplex cine halls many problems relating to the availability of parking spaces. Most of the times we need to traverse through multiple parking slots to find a free space for parking.

K. Lohith[7], presented a four wheel steering system for a car. In four wheel steering the rear wheels turn with the front wheels thus increasing the efficiency of the vehicle. The direction of steering the rear wheels relative to the front wheels depends on the operating conditions. At low speed wheel movement is pronounced, so that rear wheels are steered in the opposite direction to that of front wheels with the use of DC motor to turn left and right. In this presentation, the use of DC motor is to rotate the wheels 90 degree left and 90 degree right from original position.

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Paper on Hybrid Vehicle Parking System

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Soil Sensors as a Service: Low Cost Soil Diagnostics System using Sensors

M. Pushpalatha, R. Hariharan, R. Krishnamoorthy, R. C. Thilagarram

Department of Information Technology

Paavai Engineering College

ABSTRACT:

In agriculture to grow healthier yield nutrients existing in the soil should be managed properly. Continuous growing of plants affects the soil fertility and its fertility level goes down. Farmers should go to laboratory for testing the fertility of the soil and it's time consuming. An optical transducer is developed to measure and to detect the presence of Nitrogen (N), Phosphorus (P) and Potassium (K) of soil. Such transducer is needed to decide how much extra contents of these nutrients are to be added to the soil to increase soil fertility. This can improve the quality of soil and reduces the undesired use of fertilizers to be added to the soil. The N, P, and K value of the sample are determined by absorption light of each nutrient. The advance in the technology helps to progress even in the field of agriculture. In proposed framework, soil nutrients can be identified using IOT. PH, temperature and moisture, NPK is found using sensors. By this measure of fertilizers required for the field will be known. This helps farmers to examine soil and know its fertility level before sowing. By this large amount of yield can be gained. IOT-Internet of Things is the large domain which deals with collecting information through internet at any time, at anywhere. Which helps in monitoring system in the absence of human intervention? Which are observed by sensors, used even in farming to experiment soil, by which the fertility of soil is maintained?

Keywords: Real Time Database, DHT-11, Moisture Sensor, Cloud.

1. INTRODUCTION

Studying the variation of certain parameters within an agricultural field is the main objective of Site specific crop management (SSCM) which allows farmers and growers to ameliorate management of agricultural inputs, while taking into consideration the variability of soil attributes within their fields. And hence improves decision making about the use of those inputs (e.g. adding fertilizers, pesticides, Lime, Gypsum) in order to face the ever changing requirements of both the soil and crops. Geo-referenced soil sampling and laboratory analysis

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INTERNATIONAL JOURNAL OF RESEARCH REVIEW IN ENGINEERING AND MANAGEMENT (IJRREM)

Trust your Data - Enterprise Data Protection System using GeoFence Technology

M. Arunraj, K. Keerthiraj, T. Rubanraj, S. Sakthivel

Department of Information Technology

Paavai Engineering College, Namakkal

ABSTRACT:

A geo-fence is a virtual border for a true geographic zone. A geo-fence could be powerfully created as in a range around a point area, or a geofence can be a predefined defined of limits, and it includes an area mindful gadget of an area based administration (LBS) client entering or leaving a geofence. A system can be implemented for Enterprises against unauthorized access on secret files. It provides an authentication based on three types, such as Media Access Control (MAC), Internet Protocol (IP) and Geo-Fence Area or boundaries. A Malicious users are copy the secret files around the system within the geo-fence boundary, At the same time our system is automatically trigger and it generate the harmful virus for scrap the copied file. The users are insert the secondary device (Pen drive) into the outside of the geo-fence area, the virus file first check the GPS location , MAC Address and IP address of the current system, if it is mismatch the virus file wipe out the secret files and it also wipe out the whole system of malicious user's. Our system is also block the mail preview of the secret files.

Keywords: Media access control, GPS, LBS, Internet Protocol

1. INTRODUCTION

Geographical information is used in many fields such as ubiquitous computing, physical security, social networking services, and location aware marketing and advertisement, such as check-in and coupon delivery services .These geo-location aware technologies are triggered by a user's presence in a given geographical area, which is called geofencing. The term geo-fence refers to a virtually fenced area. The services mentioned are provided in the geo-fenced area via wireless communications, thus wireless traffic is generated in the area. This context enables the development of new access control strategies in wireless communications. Previous works have investigated ways to couple geofencing with wireless access control. These can be roughly categorized into two approaches: power control and

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STOCK VALUE PREDICTION USING MACHINE LEARNING

Prof.B.Deepa.[1], Anusiya.T[2], Dhinesh kumar.S[3] Nivetha.S[4]
Assistant Professor[1], Sengunthar College of Engineering, Tiruchengode.
UG Scholar [2][3][4]
Department of Information Technology,
Paavai Engineering College, Namakkal, Tamil Nadu, India
[1].anusiyait502@gmail.com,[2].dineshhits101@gmal.com,[3].nivethachens@gmail.com

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Abstract: In the last few years, machine learning has become a very popular tool for analysing financial text data, with many promising results in stock price from financial news, and a past values. In this work, we explore the Regression techniques, KNN techniques and one of the deep learning methods like Recurrent Neural Networks. From all these three techniques, we have a conclusion of RNN techniques helps more to analysing the stock price easily and overcome with issues associated with the accuracy of the overall values given. This paper also presents a Web API creation that build using Django Framework. It automatically updates the current value of the stock prices. The successful prediction of Stock will be a big legacy for the stock investing institutions.

Index Terms: Stock Prediction; Recurrent Neural Network; K Nearest Neighbour; LSTM; Data pre-processing;

INTRODUCTION

A stock market prediction is an attempt to forecast the future value of an individual stock, a particular sector or the market, or the market as a whole. These forecasts generally use fundamental analysis of a company or economy, or technical analysis of charts, or a combination of the two. The prediction is expected to be robust, accurate and efficient. The system must work according to the real-life scenarios and should be well. Predictive method like RNN, regression and KNN techniques is used. The data's are collected from the yahoo finance website. RNN techniques perform actions multiple times with the data's; hence it increases the predictive accuracy and reduces the over fitting of the dataset. There are various methods implementing the prediction system like statistical analysis, Fundamental Analysis, Domain Knowledge of Stock values, Technical Analysis, Machine Learning, Stock Investing Institutions and dataset structuring. Machine learning involves with Artificial Intelligence which empowers the system to learn and improve the past experience without being programmed time and again. There is a need to accurately predict the stock market which can be used in the real-life scenario. The datasets of the stock market include prediction model include details like Open values, Close values, Adjacent Close values etc., From these values, best-one will be chosen to predict the price of the stock. It reduces the overfit problem of the dataset.

DATA MINING

Stock values are collected from the site called yahoo finance. Yahoo! Finance is a media property that is part of Yahoo!'s network. It provides financial news, data and commentary including stock quotes, press releases, financial reports ,and original content. Doesn't need to change a code to collect the present data. Data's are automatically uploaded in our system.

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Makeover Features Base Human Identification with Deep Learning in Actual Period Gushing Atmospheres

T.Mahendiran1, V.Vijay2, N.M.Iswhararaj3, B.Deepa4
UG Scholar, Department of Information Technology, Paavai Engineering College, Namakkal, India 1,2,3
Assistant Professor, Department of Information Technology, Paavai Engineering College, Namakkal, India4
mahendiran15798@gmail.com1, kalavibeeshnan76@gmail.com2,
eswarajthenmozhli78@gmail.com3, deepakathir91@gmail.com4

Abstract: For face recognition in surveillance situations, recognizing a person taken on image or video is one of the main tasks. This suggests corresponding faces on both still images and video sequences. Automatic face recognition for still pictures with high excellence can realize satisfactory performance, but for video-based face recognition it is hard to achieve related levels of performance. Compared to still images face recognition, there are several difficulties of video sequences. First, pictures captured by CCTV cameras are generally of poor quality. The noise level is higher, and images may be blurred due to undertaking or the subject being out of motivation. Second, image resolution is usually lower for video sequences. If the subject is very distant from the camera, the actual face image resolution can be as low as 64 by 64 pixels. Last, face image dissimilarities, such as illumination, expression, pose, occlusion, and motion, are more serious in video sequences. The approach can address the unbalanced distributions between still images and videos in a robust way by generating multiple "bridges" to connect the still images and video frames. So in this paper, we can implement still to video matching approach to detect the faces using Grassmann manifold learning approach to know unknown matches. Finally provide speech alert at the time unknown identical in real time settings. And implement neural network grouping algorithms to classify the face images in real time captured videos.

Keywords— Image Resolution, Grassmann learning, Real time environments, Face detection, Neural network algorithm.

I. INTRODUCTION

Video sign is essentially any series of time varying snap shots. A nevertheless photograph is a spatial distribution of intensities that continue to be constant with time, while a time various photo has a spatial intensity distribution that varies with time. Video sign is handled as a chain of images referred to as frames. An illusion of continuous video is received by means of changing the frames in a faster way that's typically termed as frame price. The demand for virtual video is growing in regions which include video teleconferencing, multimedia authoring systems, education, and video-on-call for structures. Video indexing is important to facilitate green content-based totally retrieval and browsing of visual data stored in massive multimedia databases. To create an efficient index, a hard and fast of representative key frames are selected which seize and encapsulate the whole video content.

In latest years, increasing attention has been paid to the video-primarily based face recognition. Many strategies have been proposed to apply temporal information to enhance face recognition for movies. One direct approach is temporal vote casting. A nonetheless picture-matching mechanism is proposed with the aid of Satoh for matching two video sequences. The distance among two movies is the minimal distance between frames across motion pictures. However, this approach simplest considers identity consistency in temporal area, and accordingly it could no longer work well whilst the face is in part occluded. Their test shows that this method can enhance the overall performance for PCA, LDA, and ICA. The method proposed makes use of the condensation algorithm to model the temporal systems. The video face recognition framework is shown in fig 1.

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K. Shalini

Assistant Professor of English,

Paavai Engineering College,

Namakkal, Tamil Nadu, India

shalinisenthil82@gmail.com

Towards A New Dawn: A Study of Mahesh Dattani's Play "Final Solutions"

Mahesh Dattani is an incredible and unique voice on the Indian stage with intellectual prowess and creative acumen. His dramatic world is not a choice of elitist but the voice of common man and his plays are not for the promotion of psycho-philosophical ideologies but a search for the self and the society. *Final Solutions* is a dossier of Hindu-Muslim hatred winning Sahithya Academy award and stands as a fine testimony to Dattani. He, as a social scientist, discerns a mixture of diverse attitudes towards religious identity that often puts the country into human strife. Thus, the highest national recognition for his master piece play and the award citation hails Dattani the, "tangled attitudes in contemporary India towards communal differences, consumerism and gender."

Final Solutions, a resoundingly successful play, is first staged in 1993 focussing on the problem of communal disharmony between the Hindus and Muslims in India, especially during the period of post-partition riots; he examines the so-called liberal attitude to communalism. Hatred breeds hatred and the ultimate result is communal riot, communal disharmony in India. The play moves from partition related conditions to the present-day communal tension with the purpose to depict the communal violence in India and to present the consciousness and the psychological fear that haunts the affected Indians. The play has

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Women in Shackles: A Study of Mahesh Dattani's *Tara*

K.SHALINI

Assistant Professor of English, Paavai Engineering College, Namakkal, Tamil Nadu.

Abstract

A persistent and consistent effort has been taken by Mahesh Dattani, the Indian dramatist in English, to relocate the position of women in the patriarchal society. The female characters presented in Mahesh Dattani's plays are unconventional and most of the time he tries to discover the different facets of feminine psyche. He presents women in the back ground of familial relationship who are often the sufferers but they are also sensitive and strive hard to preserve their self-identity and self-respect. His soul rending play *Tara* is about conjoined twins, which on the surface is more about people and personalities. Dattani has presented the problem of the girl child Tara in an urban family living in a metropolitan city like Bangalore, where the parents have their bias towards the son, and the daughter is neglected even though she is smarter than her brother. Thus the paper attempts to speak about the prevailing female predicament that women are always in shackles within and outside the family fold. Dattani, a realist, has depicted the pressures of family and society upon Bharati and Tara and has left the ball in the readers' court so that the history of women as victims would not be repeated in many households.

Keywords: shackles, sufferers, victims, women, patriarchy

> The feminine self is not a victim in my plays. It's subsumed yes! It is marginalized, but it fights back. (Dattani, 161)

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RELIGION: AN IDEOLOGICAL CONFLICT IN MAHESH DATTANI'S FINAL SOLUTIONS

K.SHALINI
Assistant Professor of English,
Paavai Engineering College, Namakkal,
Tamil Nadu.
Email ID: shalinisenthil82@gmail.com

Abstract

Mahesh Dattani, an elite, modern and a creative thinker has discovered the world of real human experience and given drama a synonym of life itself. The play *Final Solutions* is a dossier of Hindu-Muslim hatred winning Sahithya Academy award and stands as a fine testimony to Dattani. He, as a social scientist, discerns a mixture of diverse attitudes towards a religious identity that often puts the country into human strife. For years together communal hatred has been an unresolved issue. Despite India's marvelous achievements in science and technology, rapid changes in the spheres of education and the blooming of parliamentary democracy, the monster communal hatred hampers social development, eats up the vitals of the country and crushes down the peace of the nation. The communal hatred sprouts in human consciousness and that which is exposed by human behavior is not only lurking our motherland but also it has acquired universality. The play is the finest piece of art with universal appeal voicing about the extra dimension of India, a contemporary India tormented with ideological conflict leading to confusion, violence, convulsive social and political changes. People forgetting the fact that all are Indians, they under the intoxication of religion become bloodthirsty of their country people and do all misbehaviors like killing, stabbing, setting the fire, looting, raping, etc... Thus, the paper attempts to speak about Dattani's persistent effort in comprehending and bringing in the solution for the causes of ideological conflict and religious fanaticism. Dattani is certain that having and showing humanism for fellow being is the permanent solution for communal hatred.

Keywords: Hindu-Muslim, social development, violence, .etc

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OSCILLATION OF THE EVEN-ORDER NONLINEAR NEUTRAL DIFFERENTIAL EQUATIONS

V. Ganesan[1], S. Janaki[2], M. Sathish Kumar[3] §

[1] PG & Research Department of Mathematics
Aringar Anna Government Arts College
Namakkal - 637002, Tamilnadu, INDIA

[2] The Deputy Directorate of Statistics
Government of Tamil Nadu
Namakkal - 637003, Tamil Nadu, INDIA

[3] Department of Mathematics
Paavai Engineering College (Autonomous)
Namakkal - 637018, Tamilnadu, INDIA

Abstract: The oscillation criteria are investigated for all solutions of even-order neutral differential equations. The obtained results are based on the new comparison theorems, that enable us to reduce the problem of the oscillation of the higher order equation to the oscillation of the first order equation. The obtained comparison principles essentially simplify the examination of the studied equations.

AMS Subject Classification: 34K11, 34C10
Key Words: oscillation, even-order, comparison theorem, neutral differential equation

1. Introduction

This work is concerned with oscillation behavior of a class of even-order neutral differential equation

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§Correspondence author

NONLINEAR OSCILLATION OF CERTAIN THIRD-ORDER NEUTRAL DIFFERENTIAL EQUATION WITH DISTRIBUTED DELAY

V. GANESAN[1] *, M. SATHISH KUMAR[2], S.JANAKI[3] AND O. MOAAZ[4]
[1] DEPARTMENT OF MATHEMATICS, ARINGAR ANNA GOVERNMENT ARTS COLLEGE, NAMAKKAL-637002,TAMILNADU, INDIA.
[2] DEPARTMENT OF MATHEMATICS, PAAVAI ENGINEERING COLLEGE (AUTONOMOUS), NAMAKKAL-637018, TAMIL NADU, INDIA.
[3] DEPUTY DIRECTORATE OF STATISTICS, GOVERNMENT OF TAMIL NADU, NAMAKKAL-637003, TAMIL NADU, INDIA.
[4] DEPARTMENT OF MATHEMATICS, FACULTY OF SCIENCE, MANSOURA UNIVERSITY, MANSOURA, 35516, EGYPT.
E-MAILS: GANESAN_VGP@REDIFFMAIL.COM, MSKSJV@GMAIL.COM, JANAKISMS@GMAIL.COM, O_MOAAZ@MANS.EDU.EG

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ABSTRACT. The authors obtain necessary and sufficient conditions for the existence of oscillatory solutions with a specified asymptotic behavior of solutions of a nonlinear neutral differential equation with distributed delay of third order. We give new theorems which ensure that every solution to be either oscillatory or converges to zero asymptotically. Examples dwelling upon the importance of applicability of these results.

AMS Classification: 34K11, 34C10, 34C15.
Keywords: Nonlinear, Oscillation, Distributed delay, Neutral differential equation

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ASYMPTOTIC PROPERTIES OF THIRD-ORDER NONLINEAR NEUTRAL DIFFERENTIAL EQUATIONS WITH VARIABLE DELAY ARGUMENTS

R. ELAYARAJA, M. SATHISH KUMAR[1], AND V. GANESAN

ABSTRACT. The present paper focuses on the oscillation and asymptotic properties of the third-order nonlinear neutral differential equations with variable delay arguments. By applying the Riccati transformation and the integral averaging technique, we give an analytical method for the estimation of Riccati differential inequality to establish several oscillation criteria for the discussed equation, which show that any solution either oscillates or converges to zero. We give several theorems and related examples to prove the significance of new theorems.

1. INTRODUCTION

Consider third-order nonlinear neutral differential equations with variable delayed arguments

$$\left(a(t)\left[y(t)+A(t)y(t-\sigma(t))\right]''^{\lambda}\right)'+\sum_{j=1}^{m}B_j(t)f_j(y(t-\tau_j(t)))=0, \tag{1.1}$$

$\lambda \geq 1$, where $m \geq 1$ is an integer. Further, assume that

- (H_1) $a(t)$, $A(t) \in C[[t_0,+\infty),\mathbb{R}^+)$ and $B_j(t)$, $\tau_j(t) \in C[[t_0,+\infty),\mathbb{R}^+)$ for $j = 1,2,...,m$.
- (H_2) $a'(t) \geq 0$, $0 \leq A(t) \leq A_0 < 1$, $\lim_{t\to+\infty}(t-\sigma(t)) = \infty$ and $\lim_{t\to+\infty}(t-\tau_j(t)) = \infty$ for $j = 1,2,...,m$.

[1]*corresponding author*

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Key words and phrases. Oscillation, non-linear, neutral differential equation, third order.

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Research article

Asymptotic behavior of solutions of third-order neutral differential equations with discrete and distributed delay

M. Sathish Kumar[1,*] **and V. Ganesan**[2]

[1] Department of Mathematics, Paavai Engineering College (Autonomous), Namakkal-637 018, Tamil Nadu, India

[2] PG and Research Department of Mathematics, Aringar Anna Government Arts College, Namakkal-637 002, Tamil Nadu, India

* **Correspondence:** Email: msksjv@gmail.com.

Abstract: By refining the standard Riccati substitution technique, integral averaging technique and comparison principle, we obtain new oscillation and asymptotic behavior for a class of third-order neutral differential equations with discrete and distributed delay. These criteria dealing with some cases have not been covered by the existing results in the literature. We present many sufficient conditions and related examples in order to illustrate the main results.

Keywords: oscillation; third order; delay; neutral; differential equation
Mathematics Subject Classification: 34C10, 34C15, 34K11

1. Introduction

It is prudential to say that mathematical modeling with delay differential equations have drawn clear significance because of their potential applications in diverse fields, which includes biological sciences, physical sciences, gas and fluid mechanics, signal processing, robotics and traffic system, engineering, population dynamics, medicine and the like (see for example [9,16,17]). It is now realized that the oscillation and asymptotic solutions of various classes of differential equation are an important field of investigation and its theory is a lot richer than the qualitative theory of differential equations (see for example [8, 10, 22]). The problem of oscillatory and nonoscillatory of solutions of various classes of second/third order differential equations with delayed and mixed arguments has been widely investigated in the literature (see for example [2, 4–7, 11, 12, 18, 23–34]). Various types of techniques appeared for investigations of such equations.

The purpose of this work, we are concerned with third-order neutral differential equations with

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Growth and electrochemical properties of RF sputter deposited $Li[Ni_{0.5}Co_{0.25}Mn_{0.25}]O_2$ film cathodes

G. Prathibha [a], P. Rosaiah [b,*], O.M. Hussain [c,*]

[a] Department of Physics, Mallareddy Institute of Technology, Secunrabad 500100, India
[b] Department of Physics, Paavai Engineering College, Namakkal, Tamilnadu 637018, India
[c] Department of Physics, Sri Venkateswara University, Tirupati 517502, India

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ABSTRACT

$Li[Ni_{0.5}Co_{0.25}Mn_{0.25}]O_2$ is considered to be a capable and good electrode material among the various metal oxide electrodes because of high operating voltage, high capacity, and excellent cycling performance. $Li[Ni_{0.5}Co_{0.25}Mn_{0.25}]O_2$ is prepared using mixed hydroxide route. The synthesized material has been used to prepare source target for the thin films deposition by RF-sputtering. The structural features are studied by XRD, Raman, and SEM. The films prepared at 250 °C followed by post-annealing at 700 °C displayed various peaks with good crystallinity along with (0 0 3) predominant orientation corresponding to hexagonal layered structure with R3m space group. CV and CP measurements are used to analyze the electrochemical performance of the films. The electrochemical properties of thin film electrodes have been studied by cycling voltammetry and charge-discharge cycling measurements. The $Li[Ni_{0.5}Co_{0.25}Mn_{0.25}]O_2$ film cathodes delivered an first discharge capacity of 57.5 $\mu Ah/cm^2{\cdot}\mu m$ with excellent electrochemical performance.
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1. Introduction

The spectacular development of microelectronic industry is day-by-day down-scaling its production to broad range of applications which include medical embedding, micro-sensors, ICs or micro-electro-mechanical systems (MEMS). The low dimension and high potential of such micro systems demands a high-energy and high-power in a small path area with the dimensions of 0.1–1.0 cm^3. In the present circumstances, fabrication of solid state micro power conversion/storage devices unlock a wide-ranging study to explore. Various researchers put their outstanding efforts tried to power and designed different types of micro power storage systems viz. micro-reactors [1], miniaturized gas turbines [2,3], micro-batteries [4–10], micro-super capacitors [11], micro-fuel cells [12–14] and electro-chromic display devices [15,16]. Especially, Li-ion batteries with thin film electrodes play excellent role in the development of solid-state electronic devices [17]. Among various battery electrode materials, $Li[Ni_{0.5}Co_{0.25}Mn_{0.25}]O_2$ is one of the best material as it holds good electrochemical performance and safety. To synthesize $Li[Ni_{0.5}Co_{0.25}Mn_{0.25}]O_2$, different methods have been adopted previously [18–21]. The thin film electrodes of the $LiNi_{1-x-y}Mn_xCo_yO_2$ oxides have much significance nowadays due to outstanding electrochemical outcomes [22]. The $LiNi_{0.33}Mn_{0.33}Co_{0.33}O_2$ thin film electrodes [23,24] have exhibited a high discharge capacity of 120 mAh/g. Kim et al. prepared LNCMO films electrodes using an aerosol method and reported a capacity of 44.6 $\mu Ah/cm^{-2}{\cdot}\mu m^{-1}$ [25]. Present investigation is aimed to prepare $Li[Ni_{0.5}Co_{0.25}Mn_{0.25}]O_2$ film electrodes by RF-sputtering method for the effective utilization in Li-ion batteries.

2. Experimental

$Li[Ni_{0.5}Co_{0.25}Mn_{0.25}]O_2$ thin films are prepared by RF-sputtering on gold coated Silicon substrates. A 2″ diameter $Li[Ni_{0.5}Co_{0.25}Mn_{0.25}]O_2$ target was cold pressed and sintered at 800 °C and used as target for the preparation of thin films. $Li[Ni_{0.5}Co_{0.25}Mn_{0.25}]O_2$ thin films are deposited at various Ar/O_2 ratios by maintaining the substrate temperature, sputter pressure and sputter power of 250 °C, 0.9 Pa and 140 W, respectively. The structural features of the deposited films are studied by XRD (Model:3003TT). The

* Corresponding authors.
E-mail addresses: dr.mosesrosaiah@gmail.com (P. Rosaiah), omhsvu@gmail.com (O.M. Hussain).

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Fabrication of the Mn_3O_4 thin film electrodes by electron beam evaporation for supercapacitor applications

Dadamiah P.M.D. Shaik [a], P. Rosaiah [c, *], O.M. Hussain [b, *]

[a] Centre for Applied Sciences, Sree Vidyanikethan Engineering College, A. Rangampet 517102, India
[b] Thin films laboratory, Department of physics, Sri Venkateswara University, Tirupati 517 502, India
[c] Department of Physics, Paavai Engineering College, Namakkal 637 018, Tamilnadu, India

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ABSTRACT

Electron beam evaporation technique has been employed for the fabrication ofMn_3O_4thin films on various substrates such as Pyrex Glass (PG), Stainless Steel (SS) and Au/Ti/SiO_2/(textured) Silicon (ATS). The structural properties of as deposited Mn_3O_4 films are investigated using XRD, Raman spectroscopy, SEM, EDS and AFM. The optical properties of Mn_3O_4 films are studied for the films deposited on PG substrates. The electrochemical performance of Mn_3O_4 films deposited on SS and ATS substrates are examined by Cyclic Voltammetry, Chronopotentiometry and Electrochemical Impedance Spectroscopy. The films grown on PG, SS and ATS substrates are poor crystalline, polycrystalline and crystalline in nature, respectively. The major Raman peak at 654 cm^{-1} and FTIR absorption peak at 624 cm^{-1}confirm the existence of Mn−O bonding. The SEM and AFM analysis revealed that the films deposited on PG, SS and ATS substrates covered with non-uniform spherical grains, flakes like grains and well dispersed pyramidal grains, respectively. The optical band gap of the films grown on PG substrates is 2.86 eV. The films deposited on ATS substrates exhibited superior electrochemical properties by offering the high specific capacitance of 754 F g^{-1} at a specific current of 1 A $g^{-1}$and good cycling retention (89%) even after 4000 cycles. The specific capacitance and cycling performance are further improved after annealing the films in a controlled oxygen ambience.

Prime novelty statement: Mn_3O_4 thin film micro electrodes were prepared on Au/Ti/SiO_2/Si substrates. Further to improve the structural and morphological features of the films, the films were annealed at different temperatures. The improved electrochemical performance in terms of discharge specific capacitance and cycling stability is correlated with microstructure.

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1. Introduction

In the recent years, supercapacitors have been recognized as one of the promising electrical energy storage devices for handy electronic gadgets and hybrid electric automobiles owing to their high power density, ultra-fast charging/discharging and long cycle life [1,2]. Although, the supercapacitors have interesting features such as high power density, long cycle life, high specific capacitance and extraordinary charge-discharge properties, they exhibit low energy density than batteries [3,4]. Therefore, many researchers focused on the development of high energy density electrochemical capacitors for the portable electronic devices and hybrid electric vehicles [5]. One of the key factors which influence the energy density of electrochemical capacitors (ECs) is specific capacitance. The high specific capacitance for ECs can be achieved by transition metal oxide (TMO) electrodes. In this perspective, novel electrode materials need to be discovered to meet high energy requirement of the next generation ECs. So far, various TMOs and their composites such as RuO_2, NiO, MnO_2, Co_3O_4, IrO_2, Mn_3O_4 and graphene/Mn_3O_4 are used as electrode materials in supercapacitors [6]. Among various TMOs, Hausmannite Mn_3O_4 is one of the most stable oxides of manganese and attractive electrode material for supercapacitors because of its exceptional features such as non-toxic, inexpensive, abundance, high constancy, long cycling and broad voltage window in the aqueous solutions [7,8]. Moreover, the existence of two types of ions (Mn^{2+}, Mn^{3+}) in its spinal structure provides more metal ions in redox reaction which further enhance the specific capacitance [9,10]. From the previous literature, most of the investigations on electrochemical properties of the $Mn_3O_4$are bulk and powdery form [11–13]. Very few reports are available on theMn_3O_4 thin films especially on electrochemical studies. For instance, Mn_3O_4 films were prepared by Electro deposition [14,15], Spray pyrolysis [16,17], SILAR [18,19], CBD [20], Pulsed Laser Deposition (PLD) [21] and

* Corresponding authors.
E-mail addresses: dr.mosesrosaiah@gmail.com (P. Rosaiah), hussainsvu@gmail.com (O.M. Hussain).

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Physico-chemical studies on binary aqueous solutions of Anti-Viral Influenza drugs

S. Punitha [a], R. Uvarani [b], A. Panneerselvam [c], S. Nithiyanantham [d,*]

[a] Department of Physics, Pavai Arts and Science College, Namakkal,Tamilnadu, 637018, India
[b] Department of Physics, Thiruvalluvar Govt. Arts College, Tamilnadu, Namakkal, 637401, India
[c] Department of Physics, Pavai Engineering College, Tamilnadu, Namakkal, 637018, India
[d] Department of Physics, Thiru.Vi. Kalyanasundaram Govt Arts and Science College, 610003, Thiruvaur, Tamilnadu, India

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ABSTRACT

The ultrasonic velocity, density, viscosity and absorption have been measured for solution of Influenza Anti-Viral drugs (Amantadine and Oseltamivir) are presented at room temperature 303K. By taking measurements of Anti Influenza Viral drugs at 0.2, 0.4 and 0.6% concentrations of each solution. The aim of the study is to increase the solubility, stability, sweetness of drugs by the formation of complexation. The ultrasonic velocity, density and viscosity have been measured at 2MHz for the aqueous solutions of (i) Influenza Anti-Viral Drugs + HPMC (Hydroxy Propyl Methyl Cellulose), Lactose and $CaCl_2$ (Calcium Chloride at different concentrations at a temperature 303K.The acoustical parameters such as adiabatic compressibility (β), intermolecular free length (L_f), internal pressure (π_i), Rao's constant (R), relaxation time (τ), acoustical impedance (Z_a), absorption coefficient (α/f^2), free volume (V_f), cohesive energy and solvation number (Sn) have been computed. These properties are attributed to solute-solvent interactions through hydrogen bonding, segment-segment interaction, molecular association, polymer-solvent interaction, polymer-polymer interaction and etc. The total absorption can be considered as the sum of contributions from solute-solvent interactions. These results are further supported by FTIR studies.

1. Introduction

The ultrasonic study of an aqueous mixture is important in understanding the nature of molecular interactions. The biological activity of drug molecules and the activation energy of the metabolic process basically depend on the type and strength of the inter-molecular interactions (Bedare et al., 2014). Interaction of drugs with different additives was carried out in order to increase their properties and applications; indeed, it was found so (Dileep and Malik, 2017; Dileep et al., 2018a; 2018b; 2018c). Amantadine is an antiviral medication used to prevent or treat certain influenza infections; Amantadine shows potential for use as a safe alternative/augmenting agent for treating children with neuropsychiatric and various other disorders (Hosenbocus and Chahal, 2013). Oseltamivir is an antiviral medication that blocks the actions of influenza virus types A and B in our body. Oseltamivir is an orally administered antiviral medication that selectively inhibits the influenza neuraminidase enzymes that are essential for viral replication. Oseltamivir is suitable for use in diverse patient populations, which may include young children and elderly patients, various ethnic groups and those with renal or hepatic impairment (Brian and Davies, 2010). Now a day's Ultrasonic investigations is employed in a wide range of applications in medicine, biology, industry, material science, agriculture, oceanography, sonochemistry due to its non-destructive nature (Blitz, 1963; Suslick, 1988; Mason, 1990; Naik et al., 2015; Carncim et al., 1999; Kruger et al., 1999; Masuelli, 2018). Polymers are one of the most essential products which ambiances us in every gait of life HPMC is a polysaccharide prepared from cellulose (Arumugam et al., 1998). It contains both methyl and hydroxy propyl substitutes. In the present study, HPMC has been chosen as polymer, as they have many pharmaceutical and biomedical applications (Nithiyanantham et al., 2012). A new approach for escalating a drug–excipients mixed coat with highly water-soluble has been investigated. Studies reveal that incorporation of hydrophilic substances such as HPMC, Lactose, $CaCl_2$ with drugs itself considerably increase the release rates. An important research area involves the development of sustained delivery systems, which are designed to control the release of drugs at a special rate over a defined

* Corresponding author.
E-mail address: s_nithu59@rediffmail.com (S. Nithiyanantham).

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Surfactant - Alcohol interactions: An ultrasonic, UV and FTIR analysis

N. Chithralekha[a], A. Panneerselvam[b,*]

[a] Research Scholar, R&D Centre, Bharathiar University, Coimbatore, Tamil Nadu, 641046, India
[b] Department of Physics, Paavai Engineering College, Pachal, Namakkal, Tamil Nadu, 637018, India

ARTICLE INFO

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ABSTRACT

The study focuses on the density, viscosity and ultrasonic velocity of non-ionic surfactant sorbitan sesquioleate with alcohols. Sorbitan sesquioleate dissolves in water-anisyl alcohol, water-benzyl alcohol and water-cinnamyl alcohol. Different concentrations of these mixtures are determined in order to view the Critical Micelle Concentration (CMC). To study the molecular interaction of the mixture of surfactant and alcohols, various acoustical parameters such as adiabatic compressibility (β), intermolecular free length (L_f), internal pressure (π_i), Rao's constant (R_a), absorption coefficient (α/f^2), free volume (V_f), cohesive energy (CE), relaxation time (τ), acoustical impedance (Z_a) and solvation number (Sn) have been calculated. The trends in the variation of these parameters are used to discuss the molecular interactions present among the mixtures. UV and FTIR analysis confirm this interaction of the mixture of surfactant and alcohols.

1. Introduction

Surfactants are compounds that bring down the surface tension (or interfacial tension) between two liquids, between a gas and a liquid or between a liquid and a solid. Surfactants contain both hydrophobic (hydrocarbon chain) and hydrophilic (polar head) group in the surfactant molecule. Surfactants are used as wetting agents, antifoaming agents and foam stabilizers. The two particular characteristics of surfactants are cleaning power and wetting action. These two characteristics depend on the surfactant type and kind of material to be cleaned or wet [1]. When surfactants are added to water at low concentrations, they disperse as discrete molecules. On the other hand, the surfactant molecules get accompanied to form groups or micelles at a specific concentration. This is known as Critical Micelle Concentration (CMC) [2]. Critical Micelle Concentration (CMC) is one of the vital properties of surfactant. CMC of non-ionic surfactant is affected by addition of alcohol. The addition of alcohols to aqueous solution of surfactants is helpful to investigate the effect of hydrophobic interactions on the micelle structure. The presence of alcohol in different quantities can strongly alters the physicochemical properties of micellar solution [3].

The foam quality and stability of non-ionic detergents are poor. Surface tension of the medium is lowered in which the surfactants are dissolved. Surfactant is showed a key role in tricking oil phase by lowering this interfacial tension between two media or interfaces (e.g. air/water, water/stain and stain/fabric) [4]. Lowering the surface tension of water is the basis of cleaning dirt and grease off dirty clothes and dishes. This makes it easier to lift oil. These oily dirt or grease suspended in the water lead to form emulsions. The oil is pulled towards the water by the hydrophilic head and ruins in the water.

When there is a variation in the concentration of the surfactant above or below the CMC value, the properties of the surfactants also vary significantly. Industrial applications of surfactants are always based on the value of its CMC. Micelle formation enables emulsification, solubilisation and dispersion [5]. Micellar stability is found to be inversely related to foaming ability. So highly stable micelles would lead to reduction in foaming [6]. The micelles can solubilize unsolvable soils by mixing and trapping them inside the micellar structure [7]. Anisyl alcohol ranges from colourless to slightly yellow liquid having a lovely bloomy fragrance and used in cosmetic and personal care products. Anisyl Alcohol is used as a fragrance ingredient abundantly. Benzyl alcohol is frequently used as an antimicrobial preservative or co-solvent in a variety of pharmaceutical injection formulations. The presence of this potential impurity needs to be monitored owing to its reactivity and toxicity [8].

The velocity versus concentration in liquid mixtures is taken as a sign of the presence of interaction among the different species except linearity. The physical and chemical properties of liquid mixtures have been studied by numbers of workers. It reports that the variation of parameters with structural changes occurring in a liquid as its concentrations are varied in a liquid mixture [9]. There are many factors which restricts foam stability. Among them, some of the factors are related with the physiochemical properties of the surfactant solution

* Corresponding author.
E-mail address: panneer.phy@gmail.com (A. Panneerselvam).

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Physico – Chemical Analysis of Cetyl Pyridinium Chloride (CPC) Blended by Cellulose solution

A. Panneerselvam [1*], V.Karikalan [2]

[1] Department of Physics, Paavai Engineering College, Pachal, Tamil Nadu, India - 637018
[2] PG Assistant in Physics, Government Model School, Mallur, Tamil Nadu, India - 636 203

Corresponding Author: panneer.phy@gmail.com

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Abstract- The ultrasonic velocity, density and viscosity in mixtures of Cetyl Pyridinium Chloride (CPC) with Cellulose derivatives (Methyl Cellulose (MC), Ethyl Cellulose (EC) and Hydroxyl Propyl Methyl Cellulose (HPMC)) in different concentration ranges are measured at different temperatures 303, 313 and 323K in order to find out the Critical Micelle Concentration (CMC) of Surfactant / Cellulose interaction. From the experimental data, other related acoustical parameters such as adiabatic compressibility (β), intermolecular free length (L_f), internal pressure (π_i), Rao's constant (R_a), absorption coefficient (α/f^2), free volume (V_f), cohesive energy (C_E), relaxation time (τ), acoustical impedance (Z_a) and solvation number (S_n) have been evaluated. All these parameters have utilized to study of various molecular interactions takes place in the solutions of CPC – Cellulose derivatives (MC, EC and HPMC). The FTIR and UV analysis also used to characterize these samples. The results are discussed in molecular interactions that prevail by hydrogen bonding.

Keywords : *Ultrasonic study, Cetylpyridinium Chloride (CPC), Critical Micelle Concentration (CMC)*

I. INTRODUCTION

The study of intermolecular interaction in the complex formation of considerable importance in the explanation of the structural properties of the molecule [1-2]. The intermolecular actions influence the structural arrangement along with the shape of the molecule [3]. Water soluble cellulose polymers have been shown to interact with surfactant species to varying degrees depending on the properties of the cellulose polymers and surfactants [4]. Cellulose derivatives have gained acceptance for cosmetic, food, adhesives, textiles, packaging and pharmaceutics uses. Surfactant and water soluble cellulose derivatives have very broad ranges of applications. CPC is a cationic compound used in some types of mouthwashes, lozenges, toothpastes, breath sprays, throat sprays and nasal sprays. Studies on surfactant – Cellulose derivatives complexes demonstrate the interest for the surface properties of such systems [5-7]. Several micellar systems have been investigated in the absence and presence of an external entity to explore the environment of the solubilization and to infer any change occurring in micellization behavior of surfactants [8-9]. Hydroxy Propyl Methyl Cellulose (HPMC) is nonionic, water-solvable cellulose ether. It is obtained by partial substitution of hydroxyl group of cellulose with hydrophobic hydroxypropyl and methyl groups. It has variety of applications in day to day life. The combined occurrence of surfactant and cellulose derivatives is found in diverse products such as cosmetics, paints, detergents, food, polymer synthesis and formulations of drugs and pesticides [10-11]. The presence of a non ionic cellulose polymer in aqueous solutions of cationic surfactants causes changes in the physical properties of the micelle aggregated formed by the surfactant. Some possible types of association involving either individual surfactant molecules or surfactant cluster were discussed [12-14]. Acoustical studies of surfactant and cellulose derivatives have become increasing and important in physical, biochemical and industrially useful applications. In the present study an attempt has been made to investigate the behaviour of Cetylpyridum Chloride (CPC) and Cellulose derivatives (Methyl Cellulose (MC), Ethyl Cellulose (EC) and Hydroxy Propyl Methyl Cellulose (HPMC)), in water at different concentration and temperature 303, 313 and 323K.

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High stable with efficient dye-sensitized solar cell-based Al_2O_3/graphene hybrid photoanode fabricated by simple household microwave irradiation technique

R. Gayathri[1] · G. Raja[1] · P. Rajeswaran[2]

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Abstract
A facile and one-step microwave irradiation approach was adapted to fabricate the hybrid photoanode of aluminum oxide (Al_2O_3)/graphene (GR) nanocomposite and scientifically investigated their structural, morphological and optical properties by XRD, TEM, Raman, UV, PL and BET analysis. XRD and TEM results exposed that crystal symmetry and exhibited face centered lattice with uniform plate-like nanoparticles are homogeneously covered on the surface of the graphene sheets. Mesoporous with nature with high pore size and huge surface area of Al_2O_3/GR is identified by N_2 adsorption–desorption analysis. A significant reduction in the band gap energy (4.42–3.62 eV) and rapid electron–hole pair generation process of the hybrid materials was found by UV-DRS and PL spectra analysis. Sandwich type solar cell was fabricated by deposition the hybrid materials on FTO glass substrate and technically studied the photovoltaic (PV) parameters through J–V characteristics. The results express that Al_2O_3/GR hybrid photoanode show fabulous photo conversion efficiency (PCE) of (8.21%) and high stability than compared with bare Al_2O_3.

1 Introduction

The energy crisis and common defilement makes it crucial to examine renewable and clean vitality sources [1–3]. As one of the first promising renewable and clean energy sources inside the world, sun oriented energy offers a free, clean, non-polluting, boundless resource [4–6]. Among all of the renewable energy advances, tallying hydro, sun based, wind, geothermal warm, and biomass, photovoltaic (PV) development which changes over solar energy into power is expected to be the preeminent promising procedure for temperate energy supply. Due to the energy emergency and natural contamination, solar energy is considered the foremost promising elective to traditional fossil fuels. Solar cell could be a simple strategy to straightforwardly gather and change over solar energy to power to meet the basic societal require. Over the decades, numerous materials and numerous strategies have been connected to promote the control proficiency of quantum dab sensitized sun oriented cells (QDSSCs) [7] and huge advance has been made [8–11]. The photoanode consists of distinctive morphology of ZnO [12] and TiO_2 [13], and counter electrode incorporates Cu_2S [14], CuS [15], and PbS [16] and so on. Because the metal oxide based photo anodes are superior electronic conductivity, suitable physic-chemical properties and easily tuning the band gap energy of these materials. Most importantly rapid generation of photo-generated electron–hole pairs, which absorb the more light (both UV and visible) from the solar energy further, will convert to electrical power.

Among the various kinds of metal oxides, aluminum oxide (Al_2O_3) is the foremost broadly considered lattice for graphene-ceramic composites. Al_2O_3 has amazing properties counting compression quality, hardness, wear resistance, chemical solidness, mechanical resistance, temperature steadiness, and corrosion resistance indeed at tall temperatures [17, 18]. In specific, Al_2O_3 has been broadly examined basically at high temperatures for auxiliary applications such as aviation, electrical, biomedical, and catalysis [19]. Many attempts has been utilized to improve the optical and electronic properties of these compounds for the further utilize the various kinds of applications such as bio sensors, gas

✉ R. Gayathri
gayathri8407@gmail.com

[1] Department of Chemistry, Paavai Engineering College, Namakkal, Tamilnadu 637018, India

[2] Department of Chemistry, Vivekanandha College of Arts and Science for Women, Tiruchengode, Tamilnadu 637205, India

BOREWELL CHILD RESCUE ROBOT SYSTEM USING ARDUINO

[1]D.Muregesan, [2]S.Mathanraj, [3]A.Praveen kumar, [4]R.Praveen, [5]N.Ranjith
[1]Assistant Professor, [2,3,4,5]UG Students,
[1,2,3,4,5]Department of Electrical and Electronics Engineering,
[1,2,3,4,5]Paavai Engineering College, Namakkal, India

Abstract:

In the past few years, there have been several accidents of children falling into abandoned bore wells in India. Abandoned bore wells that have turned into death pits for children. The problem is all over India. Rescue teams spend hours and sometimes days in futile attempts to save these little kids. A lot of money is also spent in these missions. In most cases they are unable to save the kids. Such events have happened umpteen times in the past, and every time either the government or the bureaucracy is blamed. The rescue process to save the child from bore well is a long and complicated process now. The rescue team tries to approach the victim from a parallel well that take about 20-60 hours to dig. This complicated process makes 70% of the rescue operations fail. The design of handling system is made in such a way that the baby/victim never gets hurt and this rescue system is sent through the same well where the victim is felt inside to bring back the victim safe through an autonomous control of drives. Our design constitutes a best Ergonomic Design and performs safest rescue operation.

Keywords : Rescue Robot & Borewell

I.INTRODUCTION

Today's major problem faced by human is water scarcity, which leads to a large number of bore wells being sunk. These bore wells in turn have started to take many innocent lives. Bores which generate water and subsequently got depleted are left uncovered. Small children without noticing the hole dug for the bore well slip in and get trapped. There is no befitting technique to rescue victims of such accidents. When the make shift local arrangements does not work, Army is called in. In most cases reported so far, a parallel hole is dug up and then a horizontal path is made to reach to the victim's body. It is not only a time taking process, but also risky in various ways. Moreover it involves a lot of energy and expensive resources which are not easily available everywhere and in this process we need big space around the trapped bore that we can dig a parallel bore. Also, the body may trap further in the debris and the crisis deepens even more means death. In most cases, we trust on some makeshift arrangements. This does not assure us of any long term solution. In such methods some kind of hooks are employed to hold the sufferers clothes and body. This may cause wounds on the body of the subject. A single accident creates a big hue and cry spreading a sense of panic among the masses. It draws a lot of undue attention and criticism of the civil administration. Heavy expenses have

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GIS BASED ANALYSIS OF SPATIAL DISTRIBUTION OF NDVI FOR AGRICULTURAL APPLICATIONS IN SALEM DISTRICT – TAMIL NADU

S. Venkadesh [a,*], R. Jagannathan [b] and K.P. Ragunath [c]

[a,*] Tamil Nadu Agricultural University, Coimbatore 641 003, Tamil Nadu, India - (venkadeshacrc@gmail.com)
[b] Retd. Professor, Tamil Nadu Agricultural University, Coimbatore 641 003, Tamil Nadu, India - jagan@tnau.ac.in
[c] Tamil Nadu Agricultural University, Coimbatore 641 003, Tamil Nadu, India – ragunathkp@tnau.ac.in

Commission III, WG III/10

KEY WORDS: NDVI, Biomass, MODIS, Crop growth, Agricultural Management

ABSTRACT:

Remote sensing satellites in recent years have emerged as a vital tool for generating the biophysical information, which further helps to evolve the optimal land use plan for sustainable development of an area. The natural resources are to be categorized to obtain the area best suitable for crop production so that they could be better utilized in agricultural planning. The Normalized Difference Vegetation Index (NDVI) has been widely used to monitor moisture-related vegetation condition. The 8-day composite and spatial resolution of 250 m for the years 2002-2012 have obtained from the Moderate Resolution Imaging Spectro-radiometer (MODIS) Surface Reflectance (MOD09A) used for grouping biomass. The MOD09A product was selected because it consisted of both visible and infrared bands, which is requisite for deriving NDVI. The NDVI was used to determine the biomass categorization had four classes B1 (NDVI of 0.06-0.10), B2 (0.1 to 0.2), B3 (0.2-0.4) and B4 (>0.4) which were rated as poor, moderate, good and excellent, respectively. Here, excellent biomass category was found to cover more area compared to other biomass categories. The per cent area covered under excellent category was (88.7 %) in Salem district. This showed that the agriculture area in this district is largely suitable for crop growth. The categorization of biomass as good to excellent in Salem might be due to the good seasonal (both monsoon) rainfall. It could pave way for better agricultural management and transfer of technology.

1. INTRODUCTION

For agriculture development and sustainable crop production, a country needs proper planning based on benchmark information. Since India has 328.729 million hectares of geographical area, the country needed strong evaluation of climate, soil and other natural resources including their potential. But this type of prescription has not been developed and exercised in the past. Agriculture is an essential component of societal well-being and agricultural production in turn influenced by health, water, ecosystems, biodiversity, economy, energy use and supply. Greater advances are being made to properly manage some of the variables involved in crop production, but success in management of climate is still limited.

In recent years, the advancement of satellite sensor technology has gradually improved the spatial resolution of polar orbiting satellite sensors that can cover large areas with high temporal frequency (such as MODIS and MERIS). These sensors can now observe the Earth with a spatial resolution of 250 to 300 meters with high temporal frequency (daily).

This spatial resolution is still too coarse to observe individual crop fields in many parts of Europe. However, it is likely that there will be at least some pixels where the fractional coverage of a single crop within the pixel is high. It is therefore necessary to obtain so-called "vegetation continuous fields" (Hansen *et al.* 2003) also called Area Fraction Images (AFI) that can be used to find those pixels and extract crop specific biophysical parameters from them with the advent of MODIS NDVI 250 m data, time series data analysis can be adapted for higher (moderate) resolution applications. However, the utility of the MODIS NDVI data products is limited by the availability of high-quality (e.g. cloud-free) data (Jin and Sader, 2005).

Remote Sensing (RS) and GIS are now providing new tools for advanced ecosystem management. The collection of remotely sensed data facilitates the synoptic analyses of Earth system function, patterning, and change at local, regional and global scales over time; such data also provide an important link between intensive, localized ecological research and regional, national and international conservation and management of biological diversity (Wilkie and Finn, 1996).

2. STUDY AREA

Salem is situated in Northwestern agro climatic zone of Tamilnadu and is bounded by Dharmapuri district on the north, Erode on the west, Villupuram and Cuddalore on the east and Namakkal and Perambalur on the south. The district occupies an area of 5,23,575 hectares, lying between 11.32° and 11.98° N latitude and 77.64° and 78.84° E longitude. The elevation in general ranges between 250 and 320 meters above mean sea level (MSL), while the hilly areas attain a height of about 1,200 to 1,500 meters above MSL. The mean annual rainfall is 875 mm and about 42 per cent of rainfall is received during the southwest monsoon season (June – September) and 39 per cent during northeast monsoon season (October-November). The location of the district for the study is presented in Fig 1.

* Corresponding author

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ASSESSING THE IMPACT OF CLIMATE CHANGE IN PONNANIYAR BASIN OF TAMIL NADU BASED ON REGCM 4.4 SIMULATIONS

V. Guhan[1,*], V. Geethalakshmi[1], R. Jagannathan[2], S. Panneerselvam[1], K. Bhuvaneswari[1]

[1] Agro Climate Research Centre, Tamil Nadu Agricultural University, Coimbatore – 641 003 (*guhanthiran@gmail.com, geetha@tnau.ac.in, panneer_selvam43@yahoo.com, bhuviagm@gmail.com)

[2] Department of Agricultural Engineering, Paavai Engineering college, Namakkal – 637018 (jagan@tnau.ac.in)

Commission III, WG III/10

KEY WORDS: AquaCrop, Yield, Water use efficiency (WUE), RCP 4.5, RCP 8.5

ABSTRACT:

Climate change induced extreme weather events such as drought and flood condition are likely to become more common and associated impacts on crop production will be more without proper irrigation planning. The present investigation was undertaken for assessing the impact of Climate change on tomato yield and water use efficiency (WUE) using AquaCrop model and RegCM 4.4 simulations. The water driven AquaCrop model was validated based on observation of field experiment conducted with four different dates of sowing (1st November, 15th November, 1st December, 15th December) at Ponnaniyar basin, Tiruchirappalli. Validation of AquaCrop model indicated the capability of AquaCrop in predicting tomato yield, biomass and WUE close to the observed data. Seasonal maximum and minimum temperatures over Tiruchirappalli are projected to increase in the mid-century under both RCP4.5 and RCP8.5 scenarios. Maximum temperature is expected to increase up to 1.7°C/2.5 °C in SWM and 1.9 °C / 2.9°C in NEM by the mid of century as projected through stabilization (RCP 4.5) and overshoot emission (RCP 8.5) pathways. Minimum temperature is expected to increase up to 1.6°C/2.2 °C in SWM and 1.6 °C / 2.1°C in NEM by the mid of century as projected through stabilization (RCP 4.5) and overshoot emission (RCP 8.5) pathways. Seasonal rainfall over Tiruchirappalli is expected to decrease with RCP4.5 and RCP8.5scenarios with different magnitude. Rainfall is expected to change to the tune of -1/-11per cent in SWM and -2 / -14 per cent in NEM by the mid of century as projected through stabilization (RCP 4.5) and overshoot emission (RCP 8.5) pathways.

1. INTRODUCTION

Water is *ess*ential for growing food, for household water uses, a critical input for industry, tourism and cultural purposes, and for its role in sustaining the earth's ecosystems. But this essential resource is under threat. Growing national, regional, and seasonal water scarcities in much of the world pose severe challenges for national governments and international development and environmental communities (Rosegrant *et al.*, 2002). In the changing climate, water scarcity is an increasingly important issue in many parts of the world. This is especially the case in arid and semiarid regions, which are exposed to frequent droughts and restricted supply of good quality water limiting crop production. Insufficient water supply for irrigation will be the norm rather than the exception, and irrigation management will shift from emphasizing production per unit area towards maximizing the production per unit of water consumed (the water productivity). There is an urgent need to optimize water use in order to maximize crop yields under water deficit conditions (Fereres and Soriano, 2007). The primary objective of this study is to determine quantitatively the expected changes of water availability and Tomato yield in the Ponnaniyar basin for future climate scenarios. This gives an opportunity to define the degree of vulnerability of water resources in the Ponnaniyar basin.

2. MATERIALS AND METHODS

2.1 Location

The field experiment was conducted in a Farmers field at Ponnaniyar basin, Mugavanur village, Vaiyampatti block of Tiruchirappalli district. The experimental site is situated at 10.51° N latitude and 78.21° E longitude at an altitude of 78.17 m above mean sea level.

2.2 Input requirement for setting up AquaCrop

AquaCrop model uses a relative small number of explicit parameters and largely intuitive input variables, either widely used or requiring simple methods for their determination. Input consists of weather data, crop and soil characteristics, and management practices that define the environment in which the crop will developed.

2.3 Impact of current climate variability on water productivity of Tomato

To understand the impact of current variability of climate on water productivity of Tomato weather data at daily time steps for a period from 1980 to 2010 was obtained from the observatory located at Anbil Dharmalingam Agricultural College and Research Institute (ADAC&RI), Tiruchirappalli. Climate data file was generated with entire dataset of rainfall, maximum temperature, minimum temperature, sunshine hours, wind speed and relative humidity in AquaCrop model. The simulation was performed for 31 years and extracted the required data (fruit yield, ET) from the output file and assessed the impact of climate variability on Tomato crop water

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Impacts of Long Term Irrigation of Treated Paper Mill Effluent on Groundwater in Karur Block

A. Meignanamoorthi[1], S. Satheeshkumar[2]
[1]Assistant Professor, Department of Civil Engineering,
Paavai Engineering College, Namakkal.
[2]Assistant Professor, Department of Civil Engineering,
Kongunadu College of Engineering and Technology.

Abstract- **Ground water is main source of irrigation in TNPL Pugalur panchayat in Karur block. Since 1987, treated paper mill effluent is stored in underground tank then it is pumped out and delivered to agricultural field for irrigation. It seems that due to continuous irrigation, effluent may percolate through the pore spaces between the soil particles and interact with the groundwater and affects the quality of groundwater. The contaminants will be transported and contribute to the nearby well and affect the quality of water in the well too. So it is necessary to test the ground water quality and find out whether it is suitable for drinking and irrigation purpose. This study deals with impacts of long term irrigation using treated paper mill effluent on ground water resources in TNPL Pugalur panchayat. The spatially interpolated water quality map was obtained as output from ArcGIS which was helpful in understanding the variation in quality of groundwater with respect to space. Visual MODFLOW incorporated with MT3D was used to simulate the groundwater flow. The direction of groundwater flow was obtained as output from MODFLOW. The direction, concentration, magnitude of the contaminant transport was obtained as output from MT3D. In this study, TDS has been chosen as contaminant transport parameter.**

Keywords- ***Treated paper mill effluent, TNPL Pugalur panchayat, ArcGIS, MODFLOW, TDS contaminant.***

INTRODUCTION

Paper industry is one of the high water consuming and effluent generating industries in the country. Effluent generated from pulp and paper mills are generally alkaline in nature and as a result the alkalinity of soil will be increasing. Too alkaline soil would not support fertilization owing to chemical wilting of crop. Thus this effluent has to be treated to reduce the pollutant load to stipulated limits before disposing it off into water bodies (treatment should be must if the water is used for irrigation). Alternatively it may be treated partially and used for irrigating field and plantation crops which will mitigate the water scarcity in the semi-arid and arid parts of the country to some extent and will economise the cost of effluent treatment. If the paper mill effluent is not within permissible limits the ground water quality and soil characteristics will be affected. Leachate is defined as the polluted liquid emanating from the base of the landfill. The downward transfer of leachate contaminates groundwater resources, whereas the outward flow causes leachate springs at the periphery of the landfill that may affect surface water bodies. Hence, leachate seepage is a long- term phenomenon that must be prevented in order to protect natural water resources. Long term usage of papermill effluent begins to leachate and affect the physical, chemical and biological parameters of ground water. Groundwater assessment has been based on laboratory investigation, but the advent of satellite technology and Geographical Information System (GIS) has made it very easy to integrate various databases. A three Dimensional model generated using MODFLOW software will be helpful in understanding the interaction between surface and groundwater and also in determing the flow of groundwater. The test results from laboratory (primary data) and wáter quality obtained from Tamilnadu Ground Wáter Board Taramani (secondary data) were given as inputs to the MT3D software, to obtain the contaminant transport map of that area.

NEED FOR STUDY

Groundwater is one of the most important alternative source which could be used for drinking, when there is a demand for surface water. Treated paper mill effluent can be a alternate source to irrigation water at some of villages of TNPL Pugalur panchayat in Karur Block. Though the effluent is treated and used for irrigation purpose, the soil profile, ground water source, livelihood of the people are affected. Major crops in this area cultivated in the starting period of TEWLIS (TNPL Effluent Water Lift Irrigation Scheme) are sugarcane, paddy, plantain, yuca or manioc (Maravalli kizhangu), groundnut, maize, millet and Corn. But now, 17 years of continuous usage of effluent water for irrigation purpose has led to the growth of only coconut and some of the grasses for cattle. Hence the water quality parameters of groundwater have to be tested and inferred whether it could be made use for drinking and irrigation purpose. Since the water quality parameters are spatially varied it is important to spatially interpolate it using ARCGIS software. Simulating of the contamination level, movement of groundwater and its interaction with surface water could be better understood by using MODFLOW software.

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AN EXPERIMENTAL STUDY ON DEGRADATION OF SOLID WASTES USING EFFECTIVE MICROORGANISMS SOLUTION

S. Satheeshkumar[1], A.Meignanamoorthi[2], C.Ramganesh[3]

[1]Assistant Professor, Department Of Civil Engineering,
Kongunadu College Of Engineering And Technology, Thottiam, Trichy, Tamilnadu, India.
[2] Assistant Professor, Department Of Civil Engineering,
Paavai Engineering College, Namakkal, Tamilnadu, India.
[3]Assistant Professor, Department Of Civil Engineering,
Mahendra Institute of Engineering & Technology, Namakkal , Tamilnadu, India.

ABSTRACT

Around the world, especially in India one of the problems is generation of solid waste due to our modern lifestyle. This solid waste involves various categories such as agriculture waste, domestic waste, etc. Among them, organic wastes are more in quantity since they are active and adversely affect the health and environment. Different types of wastes are decayed in different time period and it depends on the nature of the waste and the environment. When the waste takes more time to decompose, then the accumulation of waste is goes on increasing. So, quick decay of waste is the solution for the accumulation of solid waste. So stimulate the decay process on solid waste we were planned to use Effective Micro-organisms (EM) solution. In this study, we consider the kitchen wastes, agro based wastes such as sugar cane leaves, bagasse, etc. An attempt is made to increase the degrading rate of these wastes by the usage of an EM-solution. The effective microorganism solution is activated with the help of jaggery and distilled water. After the observation period of 45 days, the nutritional value of the samples are considered for the final report.

Key words: solid waste, Effective Micro-organisms.

I. INTRODUCTION

A huge quantity of different types of wastes is generated all over the world. The quantity and types vary from place to place depending on topography, climate, urbanization and industrialization. These wastes become a major global crisis because their management and disposal is not that much easy to attain.

About 960 million tons of wastes have been created during mining, municipal, agricultural and other processes by 2007 as mentioned in "Building and Environment"- volume 42. Of these wastes, approximately 350 million tons are of organic wastes from agricultural source.

Presently, in India, the waste generation rate in cities ranges between 200-870 grams/day depending upon the life style and size of the city. Per capita waste generation is increased by about 1.3% per year. Particularly, the

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A Vivekanandhini
Ph.D., Scholar (Agronomy), Tamil Nadu Rice Research Institute, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India

V Ravi
Professor of Agronomy, Tamil Nadu Rice Research Institute, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India

K Subrahmaniyan
Professor of Agronomy, Tamil Nadu Rice Research Institute, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India

Correspondence
A Vivekanandhini
Ph.D., Scholar (Agronomy), Tamil Nadu Rice Research Institute, Tamil Nadu Agricultural University,

Effect of different crop establishment methods on soil physical, chemical and biological properties in rice-rice cropping sequence

A Vivekanandhini, V Ravi and K Subrahmaniyan

Abstract
To study the effect of different crop establishment methods of rice on soil physical, chemical and biological properties, the field experiments were conducted in *Kharif 2016* and *Rabi* 2016-17 seasons at Tamil Nadu Rice Research Institute, Aduthurai. The study consisted of six treatments *viz.*, T_1– Non-puddled transplanted rice (NPTR) in *kharif* – No Till (NT) in *rabi*, T_2 – NPTR in *kharif* – Puddled transplanted rice (PTR) in *rabi*, T_3 – Dry Seeded Rice (DSR) in *kharif* – NT in *rabi*, T_4 – DSR in *kharif* – PTR in *rabi*, T_5 – PTR in *kharif*– NT in *rabi* and T_6 – PTR in both *kharif* and *rabi*. The results revealed that there is no significant difference between crop establishment methods on soil physical properties like soil bulk density, particle density, porosity and infiltration rate during both *kharif* 2016 and *rabi* 2016-17 season. However there is Significant different observed between crop establishment methods on soil chemical and biological properties. The soil available nutrients were lower in DSR followed by PTR during *kharif* 2016 and DSR-PTR during *rabi* 2016-17. The microbial population of the beneficial organisms namely *Azotobacter*, *Azospirillum* and PSB were observed to be higher in DSR during *kharif*2016andDSR-PTRduring*rabi* 2016-17. Therefore the higher grain yield was obtained under DSR in *kharif*2016 and DSR- PTR in *rabi*2016-17 season.

Keywords: Crop establishment methods, soil physical, chemical, biological properties, yield

Introduction
Rice is a staple food for more than half of the world's population. Worldwide, rice is grown on 161 million hectares, with an annual production of about 678.7 million tons of paddy. Rice provides 30–75% of the total calories to more than 3 billion Asians. However, the sustainability of irrigated rice production, let alone the ability to increase productivity to keep up with population growth, is threatened by increasing water scarcity (Barker and Molle, 2004) [2]. In India, most commonly practiced establishment method under irrigated rice cultivation is transplanting of seedlings into puddled soil (Rao *et al.*, 2007) [4]. In puddled condition the field was flooded for prolonged periods throughout the cropping period until shortly before harvest. The puddling have several disadvantages, including higher tillage costs, adverse effects on soil structure (So and Voase, 2000) [6], and high water requirement for crop establishment. The amount of irrigation water required for puddling varies from 100 mm (Yadav *et al.*, 2011) [7] to 544 mm (Bhuiyan *et al.*, 1995) [3].Water input for crop establishment can be reduced by avoiding puddling. Transplanting can be done in non-puddled soil after saturating the soil and for dry seeded rice sowing was done on non-puddled dry soil, both reduce the water requirement for crop establishment (Balasubramanian and Hill, 2002) [1]. In Tamil Nadu, especially in Cauvery delta zones due to late release of canal water from dams and also sometimes late onset of rainfall there will be scarcity of water availability for cultivation of rice during initial stage for puddling. In such situation these non-puddled and dry seeded rice establishment methods can be done as a contingency measures to reduce the water requirement during initial stage of cultivation.

Methodology
A field experiments were conducted on *Kharif* 2016 and *rabi* 2016-17 at Tamil Nadu Rice Research Institute, Tamil Nadu Agricultural University, to study the effect of different crop establishment methods on soil physical, chemical, biological properties and yield in rice- rice cropping sequence. The soil of experimental field was clayey loam in texture with a pH of 7.4.

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Performance of Different Crop Establishment Methods on Growth, Weeds Dynamics and Yield in Rice-Rice Cropping Sequence

A. Vivekanandhini*, V. Ravi and K. Subrahmaniyan

Department of Agronomy, Tamil Nadu Rice Research Institute, Tamil Nadu Agricultural University, Coimbatore-641003, Tamil Nadu, India

**Corresponding author*

Keywords

Crop establishment, direct seeded rice, non-puddled transplanted rice, no till, weed dynamics

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A B S T R A C T

To study the performance of different crop establishment methods of rice-rice sequence on growth, weeds dynamics and yield, the field experiments were conducted during *Kharif 2016* and *Rabi* 2016-17 seasons at Tamil Nadu Rice Research Institute, Aduthurai. Treatments consisted of T_1– Non- puddled transplanted rice (NPTR) in *kharif* – No Till (NT) in *rabi*, T_2 – NPTR in *kharif* – Puddled transplanted rice (PTR) in *rabi*, T_3 – Dry Seeded Rice (DSR) in *kharif* – NT in *rabi*, T_4 – DSR in *kharif* – PTR in *rabi*, T_5 – PTR in *kharif*– NT in *rabi* and T_6 – PTR in both *kharif* and *rabi*. The results revealed that the growth *viz* plant height, DMP and yield parameters *viz* panicles m^{-2} and grain yield were higher in DSR than PTR in *kharif* 2016 and same were higher in DSR followed by PTR during *rabi* 2016-17. The weed density and dry weight was higher in DSR and NPTR than PTR during *kharif* 2016 and in DSR followed by NT during *rabi* 2016-17.

Introduction

Rice is the staple food of the largest number of people on earth and more than 75 per cent of the rice cultivation is under irrigated condition Bouman *et al.,* (2007). However, the irrigated rice production alone has the ability to increase productivity for increasing population, but it is threatened by increasing water scarcity (Barker and Molle, 2004). In India, most commonly practiced establishment method under irrigated rice cultivation is transplanting of seedlings into puddled soil reported by Rao *et al.,* (2007).

In puddled condition the field was flooded for prolonged periods throughout the cropping period until shortly before harvest. The puddling have several disadvantages, including higher tillage costs, adverse effects on soil structure was confirmed by so and Ringrose-Voase, 2002) and high water requirement for crop establishment. The amount of irrigation water required for puddling varies from 100 mm Sudhir *et al.,* (2011) to 544 mm (Bhuiyan, *et al.,* 1995). Water input for crop establishment can be reduced by avoiding puddling. Transplanting can be done in non-puddled soil after saturating the soil and for dry seeded rice sowing was done on non-puddled dry soil, both reduce the water requirement for crop establishment (Balasubramanian and Hill, 2002). In Tamil Nadu, especially in Cauvery

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Investigation On M-Sand Based Geopolymer Concrete With Sisal And Polypropylene Fibre

[1]Anandhan. P, [2]Vivek. K, [3]Umanambi. J

[1]P.G Student, Structural Engineering, [2]Assistant Professor, [3]Head of the Department,
Department of Civil Engineering, Paavai Engineering College, Pachal, Namakkal.
Tamilnadu, India

Abstract — **One of the important issues in environment is to reduce the greenhouse gas emission. Worldwide cement industries release 5-7% of greenhouse gas. Geopolymer concrete is an alternative to conventional Portland cement concrete which is highly eco-friendly. The reaction of materials containing alumino silicates with concentrated alkaline solution to produce an inorganic polymer binder is known as geopolymer concrete. It is emerged as a possible solution for using the by-products and they could be utilized to manufacture precast structure and non-structural elements. The demand of natural sand is quite high in developing countries to satisfy the rapid infrastructure growth, in this situation developing country like India facing shortage in good quality natural sand. In order to reduce these problems, recently manufactured sand was used as partial or full replacement material with natural river sand. NaOH solution of 8M concentration is mixed with sodium silicate gel is used as alkaline solution. The primary objective of this paper is to compare the geopolymer concrete properties with sisal and polypropylene fibre. The influence of fibre content in the strength of geopolymer concrete is presented. Significant improvement of strength of geopolymer concrete with fibres are compared and observed for M30 grade of concrete.**

Keywords — **Geopolymer concrete, Sisal fibre, Polypropylene fibre, Manufactured Sand**

I. INTRODUCTION

Production of Ordinary Portland cement is highly energy intensive; consume a substantial quantity of non-renewable natural resources such as limestone deposition, coal etc. & about one ton of carbon dioxide CO2 is released in the course of the production of a ton of Portland cement. The environmental effects connected with the making of Portland cement designed an urgent need to develop alternative binder to make concrete. On the other hand, coal-burning power generation plants produce enormous quantities of fly ash. The volume of fly ash would boost as the demand for electricity increases. Most of the fly ash is regarded as waste and dumped in landfills. To examine the concerns pointed out above, it is crucial that other types of binders have to be developed to make concrete. The growth of fly ash based geopolymer concrete is in response to the need for greener concrete. The abundant availability of fly ash worldwide represents a chance to employ this by-product of burnt coal as a replacement for Portland cement to manufacture concrete. Davidov its (1988) advised that alkaline liquid could be used to react with the Si & Al in the source material of geological origin or by product material such as Fly ash, Metakaolin, GGBFS, Rice husk ash etc., to make binders. Geopolymer concrete does not employ any Portland cement in it.

In developing nations, the demand for natural sand is very high. Specifically, in India, natural sand deposits are getting depleted and causing a serious threat to the environment as well as to the society. Increasing extraction of natural sand from river beds generating a lot of issues like losing water retaining sand beds, causing bank slides, deepening of the river beds, etc., are few examples. Properties of aggregate influence the durability and overall performance of concrete, so fine aggregate is an inherent element of concrete. The most typically used fine aggregate is the natural river. One day sand will become a rare material, in this scenario; we began to look for alternative materials that are affordable and readily available. The development of sustainable infrastructure requires alternative materials that must also meet the technical requirements of fine aggregate because it must be accessible in abundance. Manufactured sand provides a viable alternative to natural sand and is a special fine aggregate developed by grinding and sieving or further processing.

The geopolymer paste binds the loose coarse & fine aggregates & other unreacted materials with each other to form geopolymer concrete. The manufacture of geopolymer concrete is carried out using the usual concrete technology strategies. High early strength, low shrinkage, freeze-thaw resistance, sulphate resistance, & corrosion resistance are the properties of geopolymer concrete. The addition of fibers in the geopolymer concrete will considerably increase the mechanical strength properties than the conventional mix.

II. MATERIALS USED

The material utilised in this present study was fly ash as source material, alkaline liquids, course & fine aggregates & water. M30 grade concrete was deemed in this study.

A. Fly ash

Class F type of fly ash obtained from Mettur thermal power plant was used in the experimental work having a fineness modulus of 7.86 and specific gravity of 2.30.

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Experimental Study on Performance of Gap Graded Concrete using Partial Replacement of Titanium Dioxide and Msand

Angel Benish M[1], Uma Nambi J[2]

[1]PG student, [2]Head of the Department
[1,2]Civil Engineering Department, Paavai Engineering College, Namakkal, Tamil Nadu, India

ABSTRACT

This paper reports an experimental investigation on the development of Gap graded concrete providing the optimal combination of strength and water permeability using M sand and admixtures. In this study, the Gap graded concrete is obtained by removing the fine aggregate wholly (0%), 5%, 10% and 15% of replacing coarse aggregate with M sand. The titanium dioxide is used as partial replacement to cement to study its behavior on mechanical properties of Gap graded concrete. Gap graded concrete trial mixes with different size of aggregate, with and without fine aggregates. Tested for its mechanical properties such as compressive strength, water permeability, and porosity. Gap graded concrete is a porous concrete which allows water and air to pass through it. The Gap graded concrete specimen of cube size of 150mm x 150mm x 150mm and they were cured in water for the period of 7, 14, 28 days. The compressive strength test and permeability is done in laboratory after curing. Then the compressive strength of Gap graded concrete is compared to the compressive strength of M20grade of concrete.

Keywords: *Gap graded concrete, M sand, Titanium dioxide, compressive strength, permeability*

1. INTRODUCTION

1.1 GENERAL

A larger amount of rainwater ends up falling on impervious surfaces such as parking lots, driveways, sidewalks, and streets rather than soaking into the soil. This creates an imbalance in the natural ecosystem and leads to a host of problems including erosion, floods, ground water level depletion and pollution of rivers, lakes, and coastal waters as rainwater rushing across pavement surfaces picks up everything from oil and grease spills to de-icing Salts and chemical fertilizers. Conventional normal weight Portland cement concrete is generally used for pavement construction. The impervious nature of the concrete pavements contributes to the increased water runoff into the drainage system, over-burdening the infrastructure and causing excessive flooding in built-up areas. Thus Gap graded concrete can play a vital role in filtration and rain water harvesting due to its porosity. This type of concrete has become significantly popular as a sustainable application during recent decades due to its potential contribution in solving environmental issues.

1.2 GAP GRADED CONCRETE

The term "Gap graded concrete" typically describes a near-zero-slump, open- graded material consisting of Portland cement, coarse aggregate, little or no fine aggregate, admixtures, and water. It is such a concrete that has high porosity and allows draining freely unlike dense, high strength concrete. Its applications are therefore in conditions where water from precipitation or other sources needs to be drained. The high porosity is achieved by the absence or very low content of fine aggregates. Gap graded concrete is also known as no-fines concrete, gap graded concrete or porous concrete. It essentially consists of cement, coarse aggregate, water and little or no fine aggregate. In normal concrete, the fine aggregates typically fill in the voids between coarse aggregates. But in Gap graded concrete fine aggregate is non-existent or present in very small amounts. Moreover, there is globally considerable research is being done on Gap graded concrete that can be used for concrete flatwork applications. Typically Gap graded concrete has water to cementitious materials ratio (w/cm) of 0.28 to 0.40 with a void content of 18 to 35%.Gap graded concrete is used in parking areas, areas with light traffic, residential streets, pedestrian walkways, and greenhouses.

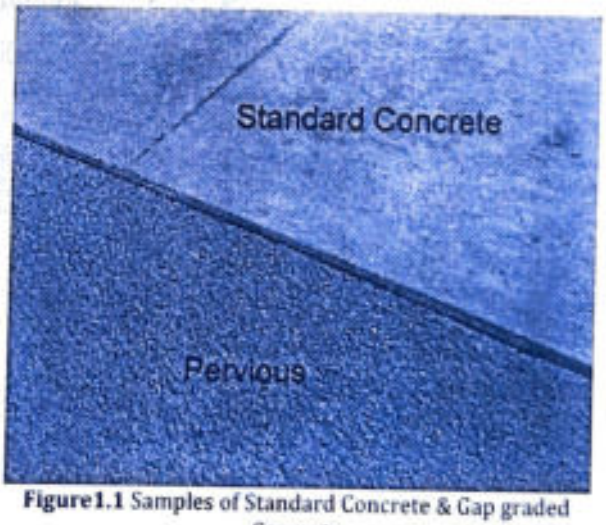

Figure1.1 Samples of Standard Concrete & Gap graded Concrete

It is an important application for sustainable construction and is one of the techniques used for ground water recharge. Gap graded concrete naturally filters water from rainfall or storm and can reduce pollutant loads entering into streams, ponds and rivers. So in this way it helps in ground water recharge. It also reduces the bad impact of urbanization on trees. A Gap graded concrete ground surface allows the transfer of water and air to root systems allowing trees to flourish.

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Study on Behaviour of Hybrid Fibre Reinforced Cementitious Composites

Meena J[1], Uma Nambi J[2]

[1]PG student, [2]Head of the Department
[1,2]Civil Engineering Department, Paavai Engineering College, Namakkal, Tamil Nadu, India

ABSTRACT
This paper highlights the material properties of the Bendable concrete for the effective development of new structures and maintenance of existing structures. The material researchers have conducted a lot of experiments based on sustainability, durability and safety point of view. As a result of the attempts, finally a new material was established in the last decade. The proper selection of the fibre, mixing of the composite exhibit strain hardening and multiple cracking behaviour of the material. The strain hardening behaviour of the Bendable concrete gives significant advantage under flexural loading. The crack width developed under loading is very small when compared with conventional concrete due to the bridging effect of the fibre. The material properties of Bendable concrete reinforced with following 0.5%, 1.0%, 1.5%, 2% of steel fibre and 0.1%, 0.15%, 0.2%, 0.25% of polypropylene fibre. The optimum strength attained at 1.0% of steel fibre and 0.1% of polypropylene fibre and has been claimed to be the most promising proportion of the fibre content. A series of experiments were carried out to determine the compressive strength, tensile strength and flexural characteristics of Bendable concrete.

Keywords: Bendable concrete, Sustainability, Strain hardening, Bridging

INTRODUCTION

1.1 GENERAL

Concrete is most widely used material for the construction. In ancient time itself the people started to use concrete for the construction because of its brittleness and compressive strength. Cement act as a binding material in the concrete to tide the aggregate. Unfortunately the production of cement consumes more amounts of natural resources and liberate large amount of CO_2 which affect environmental system. So the development of new construction material is essential.

Now a day, the concrete construction industry faces lot of problem due to availability of material and bad environmental conditions. Due to this bad effect, cracks and strength losses occurr in the construction. The concrete which is mainly strong in compression but weak in tension, is also a part of load profile. To avoid the over consumption of natural resources, supplementary cementitious materials such as fly ash, rice husk ash, silica fume are used for the structure.

Recently, construction industry introduced fibres also in the concrete to provide were strength and performance based on the brittleness and ductility behaviour. Since 2003, the new construction material "Engineered cementitious composites" is developed by Victor C. Li.

Engineered cementitious composites (ECC) is a cement based material containing a mix of cement, supplementary cementitious material, sand, water and chemical admixtures, reinforced randomly distributed fibres. ECC material can improve the tensile strength, ultimate strain capacity and large strain hardening properties than conventional concrete.

The ECC can resist large load by the crack bridging properties in the failure mode of structure. This material is also used for repairing and maintenance work also. This paper illustrates potential effect of application of ECC in the construction industry.

1.2 DEFINITION

Engineered cementitious composite is "a special type of high performance fibre reinforced concrete containing small amount of short random fibres micromechanically designed to achieve high damage tolerance under severe loading conditions and high durability under normal service conditions".

Engineered cementitious composite (ECC) is a cement based material containing a mix of cement, supplementary cementitious material, sand, water and chemical admixtures, reinforced randomly distributed fibres. ECC material can improve tensile strength, ultimate strain capacity and large strain hardening properties than conventional concrete.
Engineered cementitious composite is called bendable concrete, is an easily mortar based composite reinforced with specially selected short random fibres, usually polymer fibres. The engineered cementitious composite has ductile characteristics, when compared with normal concrete which shows brittle nature. The ECC material also forms high performance fibre cementitious composite family. The ECC is prepared with short random fibres for the effective formation of the fibre matrix as well as to the increase the bond strength. The addition of fibre improves the tensile strength, toughness along with strain capability, and it shows high damage tolerance. These properties significantly the strain hardening behaviour of the material.

Strain hardening is the ability of the material to increase the level of loading after first crack while undergoing large deformation. The addition of polypropylene fibre converts the material in to elastic. The ductility and energy absorbing capacity of the material is increased effectively. The material under loading, load bearing capacity is shows higher than the nominal concrete.

High ductility results of the interaction between cement paste and fibre delayed the crack propagation under higher

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Experimental Investigation on Mechanical Properties of Concrete with Sludge Waste and Silica Fume

V Ravi sankar[1] and J Umanambi2

[1]PG Student, Paavai Engineering college, Namakkal

[2]Associate professor, Department of Civil Engineering Paavai Engineering college, Namakkal.

mmc_ravisankar@yahoo.co.in

Abstract:

The present investigation aims to evaluate and compare the mechanical and durability properties of binary composite of cement concretes made from Ordinary Portland cement (OPC) blended with sludge waste and silica fume. Compressive strength test, tensile strength test, flexural test and coefficient of water absorption, is conducted on 28 and 90 days. The salient features of the findings are binary composite of cement concrete showed better compressive strength and same reduced the tensile strength. Samples of concrete (eg.cubes) are made in M20 grade. It is found that 0.55 water/cement ratio produced higher compressive strengths, tensile strength and better workability for M20 mix, proportion. Specifically compressive strength ranged from 18.81 -45 N/mm^2 for the mixes considered. These results compare favourably with those of conventional concrete. The concrete was found to be suitable for use as structural members for buildings and related structures, where sludge waste content did not exceed 50%.

Key words: composite cements, compressive strength, tensile strength flexural strength, coefficient of water absorption.

I. INTRODUCTION

In construction field civil engineering's facing lot problem in world due to available of materials contractor, labour, skill person, etc.. Now a day's widely facing materials problem such as river sand. The recently developed M – Sand, eco sand, silica sand, bottom ash partially or fully replaced by river sand. Sewage sludge is the residual, semi-solid material that is produced as a by-product during sewage treatment of industrial or municipal wastewater. The term "septage"

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NUMERICAL INVESTIGATION ON COLD FORMED PRESS BRAKING STEEL ZED SECTIONS UNDER AXIAL COMPRESSION

K. Vivek[1], M. Yuvraj[2], S. Revathi[2], R. Vijay Krishna[2], S. Santhosh[2]

[1]*Assistant Professor, Department of Civil Engineering, Paavai Engineering College*
[2]*Under Graduate Students, Department of Civil Engineering, Paavai Engineering College, Tamilnadu, India*

Abstract - *This paper describes a buckling behavior of a series of innovative cold form press braking steel column sections .Buckling behavior was analyzed by both theoretical and Numerical analysis. For the optimization process of arbitrarily shaped thin walled member is done by CUFSM4.03 package. The steel channel and zed sections were considered with various profile and the dimensions were comprises as per the guidelines given in North American Specification (NAS). The parametric study was also carried out by varying the yield stresses and keeping the, thickness and length of the column as constant. The sections were made with cold formed steel sheets of thickness 2mm and 600mm in length. The yield stresses of steel sheets were varied as 250N/mm², 350N/mm² and 550N/mm² which are obtained from preliminary coupon test results. Theoretical analysis was done by Direct Strength Method, which was proposed by B.W.Schafter in 2004[9]. Numerical analysis is done by finite element modelling package ANSYS 12.1 with non-linear analysis on columns. This paper describes the failure modes of buckling in Cold Formed Steel sections and nominal load carried by the column under axial compression.*

Keywords: Cold formed steel, Zed/Zee Section, FEM, DSM, Buckling Mode.

1. INTRODUCTION

Cold formed steel (CFS) is the common term for products made by rolling or pressing steel semi-finished or finished goods at relatively low temperatures (cold working). Cold-formed steel goods are created by the working of steel billet, bar, or sheet using stamping, rolling (including roll forming), or presses to deform it into a usable product. Cold-worked steel products, such as cold-rolled steel (CRS) bar stock and sheet, are commonly used in all areas of manufacturing of durable goods, such as appliances or automobiles, but the phrase cold-formed steel is most prevalently used to describe construction materials. In the construction industry both structural and non-structural elements are created from thin gauges of sheet steel. These building materials encompass columns, beams, joists, studs, floor decking, built-up sections and other components. The strength of elements used for design is usually governed by buckling. The construction practices are more similar to timber framing using screws to assemble stud frames.

A main property of steel, which is used to describe its behaviour, is the stress–strain graph. The stress–strain graphs of cold-formed steel sheet mainly fall into two categories. They are sharp yielding and gradual yielding type illustrated below in Figure 1 and Figure 2, respectively. 1.1

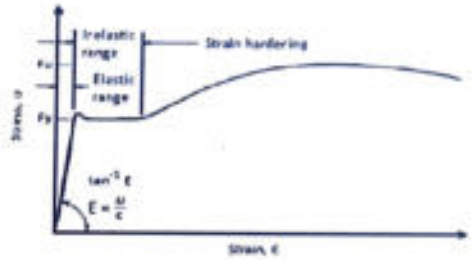

Figure -1 Sharp Yielding type

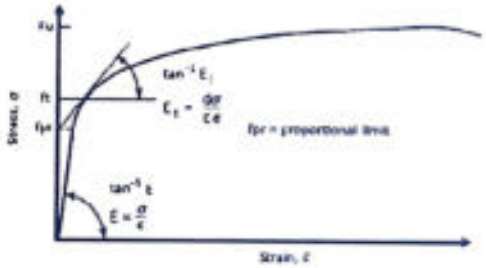

Figure -2 Gradual Yielding Type

1.1 Review Literature

A literature review or narrative review is a type of review article. A literature review is a scholarly paper, which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. Some of the literature reviews for our cold formed steel members are as follows,

André Dias Martins, et al (2017) proposed a topic on 'The direct strength design of cold-formed steel columns failing in local- distortional interactive modes.' They discuss proposals for the codification of efficient design approaches for cold-formed steel columns affected by local-distortional (L-D) interaction.

R.S. Glauz (2017) proposed on topic 'Flexural-torsional buckling of general cold-formed steel columns with unequal unbraced lengths'. The design of cold-formed steel columns

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Investigation On M-Sand Based Geopolymer Concrete With Sisal And Polypropylene Fibre

[1]Anandhan. P, [2]Vivek. K, [3]Umanambi. J

[1]P G Student, Structural Engineering, [2]Assistant Professor, [3]Head of the Department,
Department of Civil Engineering, Paavai Engineering College, Pachal, Namakkal.
Tamilnadu, India

***Abstract* — One of the important issues in environment is to reduce the greenhouse gas emission. Worldwide cement industries release 5-7% of greenhouse gas. Geopolymer concrete is an alternative to conventional Portland cement concrete which is highly eco-friendly. The reaction of materials containing alumino silicates with concentrated alkaline solution to produce an inorganic polymer binder is known as geopolymer concrete. It is emerged as a possible solution for using the by-products and they could be utilized to manufacture precast structure and non-structural elements. The demand of natural sand is quite high in developing countries to satisfy the rapid infrastructure growth, in this situation developing country like India facing shortage in good quality natural sand. In order to reduce these problems, recently manufactured sand was used as partial or full replacement material with natural river sand. NaOH solution of 8M concentration is mixed with sodium silicate gel is used as alkaline solution. The primary objective of this paper is to compare the geopolymer concrete properties with sisal and polypropylene fibre. The influence of fibre content in the strength of geopolymer concrete is presented. Significant improvement of strength of geopolymer concrete with fibres are compared and observed for M30 grade of concrete.**

***Keywords* — Geopolymer concrete, Sisal fibre, Polypropylene fibre, Manufactured Sand**

I. INTRODUCTION

Production of Ordinary Portland cement is highly energy intensive; consume a substantial quantity of non-renewable natural resources such as limestone deposition, coal etc. & about one ton of carbon dioxide CO2 is released in the course of the production of a ton of Portland cement. The environmental effects connected with the making of Portland cement designed an urgent need to develop alternative binder to make concrete. On the other hand, coal-burning power generation plants produce enormous quantities of fly ash. The volume of fly ash would boost as the demand for electricity increases. Most of the fly ash is regarded as waste and dumped in landfills. To examine the concerns pointed out above, it is crucial that other types of binders have to be developed to make concrete. The growth of fly ash based geopolymer concrete is in response to the need for greener concrete. The abundant availability of fly ash worldwide represents a chance to employ this by-product of burnt coal as a replacement for Portland cement to manufacture concrete. Davidov its (1988) advised that alkaline liquid could be used to react with the Si & Al in the source material of geological origin or by product material such as Fly ash, Metakaolin, GGBFS, Rice husk ash etc., to make binders. Geopolymer concrete does not employ any Portland cement in it.

In developing nations, the demand for natural sand is very high. Specifically, in India, natural sand deposits are getting depleted and causing a serious threat to the environment as well as to the society. Increasing extraction of natural sand from river beds generating a lot of issues like losing water retaining sand beds, causing bank slides, deepening of the river beds, etc., are few examples. Properties of aggregate influence the durability and overall performance of concrete, so fine aggregate is an inherent element of concrete. The most typically used fine aggregate is the natural river. One day sand will become a rare material, in this scenario; we began to look for alternative materials that are affordable and readily available. The development of sustainable infrastructure requires alternative materials that must also meet the technical requirements of fine aggregate because it must be accessible in abundance. Manufactured sand provides a viable alternative to natural sand and is a special fine aggregate developed by grinding and sieving or further processing.

The geopolymer paste binds the loose coarse & fine aggregates & other unreacted materials with each other to form geopolymer concrete. The manufacture of geopolymer concrete is carried out using the usual concrete technology strategies. High early strength, low shrinkage, freeze-thaw resistance, sulphate resistance, & corrosion resistance are the properties of geopolymer concrete. The addition of fibers in the geopolymer concrete will considerably increase the mechanical strength properties than the conventional mix.

II. MATERIALS USED

The material utilised in this present study was fly ash as source material, alkaline liquids, course & fine aggregates & water. M30 grade concrete was deemed in this study.

A. Fly ash

Class F type of fly ash obtained from Mettur thermal power plant was used in the experimental work having a fineness modulus of 7.86 and specific gravity of 2.30.

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Durability Study on Self Compacting Concrete with Mineral Admixture

Boopathi V[1], Sharmila Devi K[2]

[1]PG student, [2]Assistant professor
[1,2]Civil Engineering Department, Paavai Engineering College, Namakkal, Tamil Nadu, India

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ABSTRACT

Self-compacting concrete can be placed and compacted under its own weight without any vibration and without segregation or bleeding. The use of mineral admixture (such as fly ash, GGBS, etc.) as partial replacement of cement in SCC can bring down cost. The use of industrial waste such as fly ash, GGBS, etc in the binder of concrete reduces the storage, disposal and environmental problems. The most beneficial property with M-SAND addition to the concrete in the hardened state are the tensile strength, impact strength, the toughness and the energy absorption capacity. In the present study the mix design for M50 grade SCC was first carried out in accordance with EFNARC guidelines. The cement will be replaced with GGBS and fine aggregate get replaced with manufacturing sand Test such as slump flow,V funnel were carried out on fresh concrete and the optimum dosage of super plasticizer was found and cubes were cast for 7,28,56 days for the mix ratio 1:1.40:1.27:0.34. The influence of GGBS on the workability, mechanical strength and durability aspects like water absorption test, sulphate attack test, acid resistance test,rapid chloride penetration test , sorptivity test , linear polarization resistivity test and alkalinity test of self-compacting concrete are studied.

Keywords: *SELFCOMPACTING, FLY ASH, GGBS*

1. INTRODUCTION

1.1. GENERAL

Concrete is the most commonly used construction material worldwide. In India, reinforced concrete (RC) is extensively used in the construction of variety of civil infrastructure applications including small and large buildings, houses, bridges, storage tanks, dams and numerous other types of structures in India. The demand for concrete as construction material increases, and the demand for Fine aggregate increases. Some researchers said that the concrete industry globally would consume 48 billion tons annually of natural aggregates. Such large consumption of natural aggregates will cause destruction to the environment. In the last few decades, there has been rapid increase in the waste materials and by-products production due to the exponential growth rate of population, development of industry and technology and the growth of consumerism. The basic strategies to decrease solid waste disposal problems have been focused at the reduction of waste production and recovery of usable materials from the waste as raw material as well as utilization of waste as raw materials whenever possible.

The beneficial use of by-products in concrete technology has been well known for many years and significant research has been published with regard to the use of materials such as coal fly ash, pulverized fuel ash, blast furnace slag and silica fume as partial replacements of Portland cement. Such materials are widely used in the construction of industrial and chemical plants because of their enhanced durability compared with Portland cement. The other main advantage of using such materials is to reduce the cost of construction. Several efforts are in progress to reduce the use of natural river sand as fine aggregate in concrete in order to address the ground water issues and natural aggregate depletion. Over recent decades, intensive research studies have been carried out to explore all possible reuse methods. M-Sand, Construction waste, Blast furnace, steel slag, coal fly ash and bottom ash have been accepted in many places as alternative aggregates in embankment, roads, pavements, foundation and building construction, raw material in the manufacture of ordinary Portland cement.

1.2. SELF COMPACTING CONCRETE (SCC)

Making concrete structures without vibration have been done in the past. For examples, placement of concrete under water is done by the use of tremie without vibration. Mass concrete, and shaft concrete can be successfully placed without vibration. But the above examples of concrete are generally of lower strength and difficult to obtain consistent quality. Modern application of self-compacting concrete (SCC) is focussed on high performance, better and more

3D Adventure Game Using Unity

R. Raguman, M. Santhakumar, X.P. Thomas and M. Revathi

Abstract--- *3D game with a First Person Shooting as well as Third Person Shooting mode available in which the player has to search the enemies on an amazing terrain map and kill the enemies using own wit and action.Project mainly deals with the development of a 3d game application with the Unity game engine for windows OS. In this game there are a few different kinds of enemies on the terrain and they possess many different kinds of Artificial Intelligence (AI) movements such as: 8 direction movement that helps player to move in directions like north-east, south-west, etc. rather than just north or west or south, Auto aiming that comes into play when player is in the line of sight of the enemy, Bullet/ spell/ Projectile shooting created using a muzzle flash that starts firing at the player when it comes in the range fixed by us, Wind which uses particle system to create wind and the force effects everything around it like blades of grass, leaf falling from the tree, hair of the player, etc. The player has to search for clues, solve them, kill enemies and explore places to gain extraordinary power.The video game market is not just serviced for PC and Xbox. It is adaptive to mobile platforms like IOS, Android and Windows Phone.*

I. INTRODUCTION

THIS project mainly deals with the development of a 3D game application with the Unity 4 game engine for Windows OS.

Recently, the video game market appears to be of an unprecedented stage, which means the springing up of more platforms lead to more competition. The video game market is not just serviced for PC, PS3 and Xbox. The mobile platforms basis on iOS, Android and Windows Phone rise sharply. As a result, “cross-platform” come into people’s eyes.

Real time 3D games have existed for approximately ten years now.

We have played them, created assets in the style of our favorites, and maybe even “moded” a few of them. However, until recently, the cost of licensing one of the premier game engines has ranged from several hundred thousand to several million dollars per title, relegating the dream of creating one’s own 3D game to an unattainable.

R. Raguman, UG Student, Dept., of CSE, Paavai Engineering College, Namakkal.

M. Santhakumar, UG Student, Dept., of CSE, Paavai Engineering College, Namakkal.

X.P. Thomas, UG Student, Dept., of CSE, Paavai Engineering College, Namakkal.

M. Revathi, Assistant Professor Dept., of CSE, Paavai Engineering College, Namakkal.

DOI:10.9756/BIJSESC.9015

II. UNITY GAME ENGINE

Unity 3D is a game engine and complete integrated development environment (IDE) with an integrated editor, asset workflow, scene builder, scripting, networking and more. It also has a vast community and forum where any person wanting to know and learn to use Unity can go and have all their questions answered.

There are five main views used in the Unity editor to get all the work done, the project view, scene view, game view, hierarchy view and inspector view, all of which are explained in more detail below.

III. THE SCENE VIEW

The scene view is one of the most used views as this is where all the game objects are placed and scenes for the game are built.

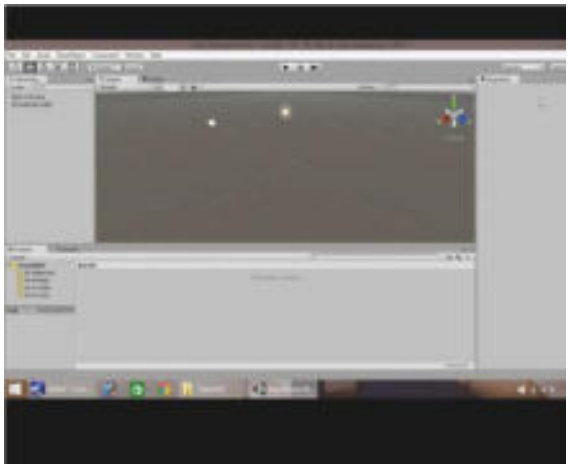

Figure 1: Unity Scene View

In figure 1 the scene view is shown with a level from the Brick breaker game. The level is designed in 3D, although it is played more as a 2D game. “To create a 2D game in a 3D environment, the one degree of freedom is removed. The y axis is all but ignored and the camera is placed in orthographic mode looking down on the screen as though it were played on the top of a table.” [1] In the project the view was turned to give it a 2D feel which is used for all the games built during this project. The level looks very different in this view as it would in the game.

IV. THE GAME VIEW

The game view is what user will see when the game is started. There are several options for this window. Across the top of the window there are several button/drop down menus which can change things from the perspective, full screen, and gizmos shown in the game view.

Increasing Lifetime through Sleep Awake and Conditional Transmission in Wireless Body Area Networks

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Karthik. J(✉)
St Peters University, Chennai, Tamil Nadu, India
karthikvalavan@gmail.com

Dr. A. Rajesh
C. Abdul Hakeem College of Engineering and Technology, Vellore, Tamil Nadu, India.

Abstract—Human health is being monitored by wireless sensors from their home using wireless body area networks. Increase in the wireless body sensors made human to monitor health with great ease. Patient need not be stay in hospital for long time instead they may use body sensors and they may monitor their health from their residence itself. So that patients easily will be moving around their residence. Even though development of technology made ease of every task there are also constraints that need to be reduced. Since the body nodes are very tiny the battery used for the sensor is also small, in turn the battery capacity is also greatly reduced. So the life time of the sensor nodes are very low and in turn network lifetime also will be very less. In order to increase the life time of the node energy consumption should be monitored with more care. In our proposed system we implement sleep awake method along with conditional transmission to reduce the energy consumption that automatically increases the life time of the node as well as network. Our proposed method gives better result when compare with the performance of other methods in saving energy.

Keywords—Energy, sleep awake, conditional transmission, network lifetime, body sensors.

1 Introduction

Nowadays human health is being affected more by various diseases. So they may need to be stayed in hospital for long time. Very often people are going to hospital. Particularly aged people are suffering by more illness and that may cause to stay in the hospital for long time. People are feeling uncomfortable when they are in the hospital and that situation itself affects human heath badly. Patients are needed to be set freely to recover from illness very quickly. But at the same time they need to be monitored very carefully to ensure that they are not in critical health condition. This can be done with the help of wireless body area sensor networks.

Springer Link

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Published: 30 October 2018

Optimal route path sustainability in military information system with reduced interference effect

V. Vignesh & K. Premalatha

The Journal of Supercomputing **75**, 6106–6117(2019)

125 Accesses | **1** Citations | Metrics

Abstract

The main purpose of this work is to exploit MANET environment in military environment to broadcast the data through efficient data transmission rate. This eventually results in different security issues like conflict and collision. These complexities could minimize the distribution of the packet ratio. Constant position node environment has been used in prevailing system, with interference-aware routing based on its nearby nodes. The previous researches could not handle the interference effects that occur in run time, and as a result, the performance of the system might get affected. In order to handle these issues, interference effect is evaluated in the proposed work to eliminate the packet loss. A novelty based on interference avoidance using coefficient of restitution measure approach has been proposed. This will obtain the incoming packets from more than

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Research paper

A Flash Flood Early Warning System: Algorithm and Architecture

Asokan Jayaram [#1], Sanjoy Deb [*2]

[#] Assistant Professor, Paavai Engineering College, Namakkal,Tamilnadu,India
[*]Corresponding author E-mail: jasokan77@gmail.com

Abstract

The flash flood is one of the most lethal forms of natural hazards and every year damages colossal properties and causes human deaths. An early flash flood detection and warning system can provide an effective solution to this problem by giving people sufficient time to evacuate and protect their life and property. On the other hand, presently Wireless Sensor Network (WSN) based systems are widely used as an effective warning system against different hazard scenarios e.g.; fire, tsunami etc. Such WSN based system can also be design to generate an early warning against the Flash Flood and such system is high on demand. This system will be having sensor nodes, processing unit and warning unit etc, for successful prediction and warning generation. Under present work, a WSN based indigenously designed, low cost, accurate and automated Flash Flood Early Warning (FFEW) system has been proposed and studied with technical details. The algorithm of the central processing unit/block for the proposed system has been implemented with MATLAB Simulink and also hardware implemented with PIC microcontroller. Experimental outcomes show that such system will be very much effective to generate a valuable early warning against the devastating flash floods and will be helpful in preventing huge collateral damage.

Keywords: *Flash Flood, WSN, Microcontroller, RF Transmitter-Receiver, Rain Gauge sensor*

1. Introduction

According to World Meteorological Organization (WMO), a flash flood is generally defined as a rapid onset flood of short duration with a relatively high peak discharge [1]. The flash floods are one of the most lethal form of natural hazard (based upon the ratio of fatalities to people affected), and cause millions of dollars in property damage every year [1]. Flash floods can be triggered by a variety of events including intense rainfall, failure of a natural (e.g., glacial lake debris) or manmade (e.g., dam, levee) structure that is impounding water, or the sudden impoundment of water upstream of a river ice jam [1]. Along with the whole world India is also vastly affected by such catastrophic events in long and recent past [2]. In recent time, Flash floods has killed 250 people on October 8 2009 at Andhra Pradesh, 103 people on 6th August 2010 at Ladakh, 31 people on 3rd August 2012 at Uttarkashi, 24 people on 23rd September at Northern Sikkim (death) and left several people injured as well as coasted huge property loss [2]. Few years back on 18th June, 2013 the biggest flash flood event has occurred in Indian history, at Kedarnath (Uttarakhand), which has killed more than 10,000 people according to the Govt. report [2]. Flash flood, its deadly consequences and relevant safety measures are the burning issues to the researchers, scientists, engineers and domestic and international policy makers throughout the world [3-5]. Successful prediction of flash flood and generating an effective early warning, are under active research especially in remote and inhospitable forest mountain regions where flash floods are highly unpredictable and deadly [6]. Design and successful implementation of such forecasting and warning system can protect life and property loss [7-8]. Such issues can be significantly addressed with the design and implementation of fully automated Wireless Sensor Network system based Flash Flood Early Warning (FFEW) system. Now-a-days Wireless Sensor Networks (WSN) are vastly implemented as healthcare, defence and security, environmental monitoring and building/structural health monitoring system [9]. Such type of WSN based indigenously designed, low cost, accurate and automated FFEW system is highly on demand in India as well as around the world. Present work has been devoted to develop an effective architectural algorithm for such FFEW system. Along with the algorithm, the technical specifications and functionality of the different blocks of the proposed system has been discussed elaborately. Under present study, the core algorithm of FFEW system has been simulated with MATLAB Simulink and simulation outcome has been analysed. Being hindered by the financial issue, only the central processor block of the proposed system, has been programmed, designed and implemented with PIC microcontroller. Using the designed software and hardware model, proposed FFEWS system algorithm has been verified experimentally.

2. System Architecture

Under the architecture of the proposed WSN system, a group of end point sensor nodes which will serve as primary nodes. The primary nodes will be connected to a particular number of secondary nodes and those secondary nodes will be connected to a base station. Number of end point sensor nodes or primary node and gate way nodes or secondary node can be varied based on the range of the application but there will be a single base station in a particular locality which will generate some warning signal as well as can be linked with concerned public office through GPS [9].

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Adve

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SPECIAL ISSUE PAPER

Performance improvement in vertical heterogeneous handoff methodology using CANFIS classification approaches

R. Mohanapriya ✉, K.B. Jayanthi

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https://doi.org/10.1002/cpe.5062

Summary

Detection of malicious Base Stations (BS) in heterogeneous wireless networks is significant for developing an efficient system in wireless networks. In this paper, the handoff is performed between two different networks such as Wi-Fi and WiMax, which may be located in different locations in the same region. The trust features, Cumulative Binary Features and Cost Index Features of each BS in different wireless network environment, are derived individually, which differentiates the behavior of the normal BS and malicious BS in different networks using Co-Active Neuro Fuzzy Inference System (CANFIS) classification approach. The proposed methodology is compared with other state-of-arts methods for evaluating the individuality and efficiency. The proposed heterogeneous handoff methodology achieves 96.02% of packet delivery ratio, 90% detection rate, 94.6% of precision, and 15.99 ms of latency.

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Research Article

HVQ BASED PULMONARY NODULES EXPEDITIOUS DETECTION USING THORACIC CT IMAGES

Sudha Muthusamy,Renugadevi Ravichandran and Shobana Swaminathan

ECE, Paavai Engineering College (Autonomous), Namakkal ,Tamilnadu , India

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A Novel CAD system based on hierarchical scale vector quantization scheme is proposed in this paper.

ABSTRACT

It is difficult to identify lung cancer by the radiologist from the computed tomography scan. A Novel CAD system based on hierarchical scale vector quantization scheme is proposed in this paper. The high level VQ gives accurate lung segmentation from the chest volume compared to the commonly used simple thresholding approach. The low level VQ is used for identifying Initial nodule of the lung. Its effective and computationally efficient. Rule based filtering operation is combined with feature based SVM technique. The proposed system was conducted and they having at least one juxta pleural nodule .The experimental result says that our CAD system obtained 82.7% of overall sensitivity at a specificity of four FP's Per scan and 89.2% sensitivity at 4.14 FP's per scan for the preformation of Juxta pleural nodule compared to CAD System. The proposed system shows a good performance for its fast and adoptive detection of Pulmonary Nodule via CT imaging.

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INTRODUCTION

A respiratory organ nodule could be a "spot" on the respiratory organ that's but three cm (or 1½ inch) in diameter. If a spot is larger than three cm, it's thought-about a respiratory organ mass, instead of a respiratory organ nodule. The overall probability that a respiratory organ nodule is cancer is four-hundredth; however that risk varies heaps reckoning on factors. As nodules are the most common sign of lung cancer, nodule detection in chest images is a main diagnostic problem. Conventional projection radiography could be a straightforward, cheap, and wide used clinical trial. Unfortunately, its capability to find carcinoma in its early stages is proscribed by many factors, both technical and observer-dependent. Lesions are relatively small and usually contrast poorly with respect to anatomical structures.

This part explains why radiologists area unit ordinarily attributable with low sensitivity in nodule detection, starting from sixty to seventieth. In this paper, we propose a classification method for Lung nodule which is of four type .The lung nodule which involved are Well-circumscribed, Vascularized, Juxta pleural and its tail. These are identified by low dose computed tomography scan .In this, the proposed method is based on combinational purpose of lung nodule and its surrounding ie., the anatomical structure. The detection step in automatic detection and classification of lung nodules from low-dose CT (LDCT) scans the Early Lung Cancer Action Project (ELCAP) screening study is conducted. Overall, this paper shows a relationship between the spatial support of the nodule templates and therefore the resolution of the LDCT, which may be wont to mechanically choose the guide size.

MATERIALS AND METHODS

[Ref .1] This involves with the three main stages-An Adaptive patch based Division, a new feature is designed to incorporate the intensity, Texture and the information of the gradient and then contextual latent sematic Analysis and classifier. [Ref.2] For the purpose of detecting both the solid nodules and Ground-Glass opacity nodules a new Computed Tomography (CT) lung Nodule Computer Aided Detection (CAD) method is proposed. This method involves with the various method like lung region segmentation by using Fuzzy Thresholding method. This is separated from the CT images. Rule-Based filtering is used to remove the non-nodule objects. This is followed by a SVM Technique. This is to further remove or reduce the number of false images or objects. [Ref.3] The other method examines the Automatic Detection and the nodule classification from the LDCT Scan. The issues are detailed in this paper .The purpose is to show a relationship between the spatial support of the nodules and the resolution of the LDCT.

Corresponding author:* **Sudha Muthusamy
ECE, Paavai Engineering College (Autonomous), Namakkal ,Tamilnadu , India

Poultry Coop Mister Atomization using Advance Controller

M.Sudha[#1], K.Krishnapriya[#2], G.Arthi[#3], K.Jananipriya[#4]

Assistant Professor[#1], UG Final year students[#2,3,4]

[#]ECE Department, Paavai Engineering College(Autonomous), Namakkal, Tamilnadu

[1]sudhamuthusamypec@paavai.edu.in

[2]aarthigandhi1405@gmail.com

***Abstract*— In poultry there is a large number of broiler hen and laying hen in rustic areas. The normal body heat of a bird is 41 degree Celsius. A bird is most comfortable and grows faster in temperature ranging from 10-20 degree Celsius. If the temperature is greater than 30 degree Celsius, the body temperature of bird is reached 47 degree Celsius thus it dies from heart failure. The temperature is increased or decreased certain level it will reduce growth, smaller eggs, weak egg shells, depressed reproductive performance. So it is necessary to maintain or control the temperature, humidity, pH level, moisture. In middle days people use evaporative and non-evaporative cooling methods. As these methods are suitable only when temperature is lower than bird's body temperature. In recent day's ventilation fan, ventilation controller, wet bulb are used to maintain humidity. These also have disadvantages of user interpretation of temperature measurement, mercury hazards etc., To overcome all these drawbacks we introduces the atomizing mister which is automatically and continuously sense the temperature and humidity level. Auto adjust the temperature level using PIC microcontroller for poultry farm. If the temperature level is exists a certain range the tiny range of pressurized water will reveal in end of shower head or nozzle. Compared to existing work, our project performances very fast, inexpensive, eco-friendly.**

***Keywords*— Arduino, Temperature sensor, Humidity sensor, Atomation, Relay, Sprinkler.**

I. INTRODUCTION

Poultry cultivation is an affair of increasing domesticated birds such as chicken, ducks, geese, and turkeys for the reason of farming meat or egg for food. The important challenges are faced by farmers in poultry is sudden climate changes. The sudden climate changes leads loss of productivity or increasing costs & decreasing reproductive capacity. The studies of the department of environment, food &rustic affairs on hens found that the high temperature, rain fall & relative humidity has profound effects on poultry production especially in meat & egg production, outbreak of diseases, food intake as well as immune response system. So the poultry farmers uses the climate change adaption techniques includes dietary shifts, breeds comforts to the local environment, suitable housing & dis infection manner. Also it is a need to birds must be limited so as to protect them from physical hazards, rain, extreme of heat & cold. But these adaption methods of climate change has negative effects on poultry production faced by farmers which includes limited finance & poor management resulting in low productivity. Remote sensing techniques was introduced by [7] in an efficient manner. Thus for temperature & humidity management we introduce the automation humidifier. The automation humidifier will get switched on automatically depends on reading from temperature sensor. The microcontroller is sufficient for control & monitor whether the humidifier is switch on or off automatically. It has different characteristics option like temperature, humidity, etc. It provides energy conservation & doesn't need any manual monitoring.

II. LITERATURE SURVAY

In earlier days many researcher focused on this atomization mister concept which will enhance the poultry production. Several discussion was made by the investors and also detailed analysis were done to improvise the societal margin. Mahmoud Shafik was proposed about atomized humidification process under the topic of "An ultrasonic automation unit for heat and moisture exchange humidification device for intensive care medicine application". In this project he used heat and moisture exchange technology (HME). But here the devices were complicated to use, expensive and not suitable for use more than 24 hours [1].

Anit Kumar Jain was proposed about the humidity control under the topic of "Thermal performance analysis of pump less earthern pipe evaporative air cooler". Here, the evaporative air coolers are primarily used. But these devices are not suitable for excess hot & excess humidity climates [2].

Rakki Reddy, Drishti Kanjilal, Dhivya Singh, Prof. Jimmy Mathew were proposed about animal farming, farm automation, farm security under the topic of "Smart form: Extending automation to the farm level". But they couldn't clearly explain in their project about temperature & humidity management of farm house [3].

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Cluster-Based Energy Hop Count Analysis for Dynamic Route Selection in Mobile Wireless Sensor Network

M. Sudha[1,*] *and J. Sundararajan*[2]

[1] Department of Electronics and Communication Engineering, Paavai Engineering College, Namakkal, Tamilnadu, 637 018, India
[2] Pavai College of Technology, Namakkal, Tamilnadu, 637 018, India

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Abstract: The routing in Mobile Wireless Sensor Networks (MWSN) has been considered in a limited article which influences the quality of service of MWSN. The prior methodologies consider the traffic-based routing which screens just the blockage quantity in the routes accessible. In true conditions, considering the energy parameters in the hops of routes would not create effective execution. To enhance the service in mobile wireless sensor network, a productive zone-based Cluster Energy Hop Based Dynamic Route Selection (CEH-DRS)for the most extraordinary element of mobile wireless sensor networks is that the nodes can perform both the gathering and transmission of packets, additionally, they support routing the information packages arise from different source nodes to achieve different intentions. The CEH routing scheming to observe the traffic in various location of the network and when the routes are observed, they are part as indicated by the local parameters. Based on the traffic proportion, energy and hop-record delicate elements of the routes, the strategy plays out a dynamic determination of sending route-based on a cluster. The strategy chooses the route through the number of parameters considered, and is based on that a productive route has been chosen in such an approach to keep up the throughput and increase the lifetime of the network.

Keywords: Cluster, routing, Energy, Route selection, Wireless network, Hop count

1 Introduction

Routing is the procedure of data trade starting with one host then onto the next in a network. Routing is the component of sending a parcel to its goal, utilizing the most effective way. In a wireless network with shared assets, where various senders go after connection transfer speed, it is important to modify the data rate utilized by every sender altogether not to over-burden the network. Bundles that touch base at a switch and can't be sent are dropped; subsequently, an unreasonable number of parcels landing at a network bottleneck prompt numerous parcel drops. These dropped bundles may as of now have voyage far in the network, and in this manner expended noteworthy assets.

Furthermore, the lost parcels frequently trigger retransmission, which implies that considerably more bundles are sent into the network. Hence network congestion can seriously break down the network throughput. On the off chance that no proper congestion control is played out, this can prompt a congestion fall in the network, where no data is effectively conveyed. Another course disclosure is required just when every one of these ways come up short. To monitor various courses, the routing section for every goal contains a rundown of the following hops alongside the relating hop tallies.

All the following hops have a similar arrangement number. For every goal, a node keeps up the publicized hop check, which is characterized as the greatest hop mean every one of the ways. This is the hop check utilized for sending course ads of the goal. Each copy course ad got by a node characterizes an elective way to the goal.

To guarantee circle opportunity, a node just acknowledges a substitute way to the goal, in the event that it has a hop tally lower than the hop tally promoted for that goal. In these sorts of networks, a large portion of the nodes relies upon different nodes to forward the parcels. There are some extraordinary nodes, which give away just between specific sets of nodes. In connection to the nodes that exhaust their battery and quit working, there is a probability that a few nodes can't convey any longer.

* Corresponding author e-mail: sudhaauphd@mail.com

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Design of double edge-triggered flip-flop for low-power educational environment

L Punitha, Krishnasamy Nirmala Devi, Deepa Jose, J Sundararajan

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Abstract

Power consumption plays a significant role in any integrated circuit. In this study, an explicit type pulse trigger flip-flop is implemented using the CMOS 90 nm technology. For low-power dissipation, 1 V supply will optimize the size of gate terminal. This explicit type flip-flop uses an explicit source for pulse generation, that is, the double edge-triggered pulse generator, which requires half of clock frequency compared to the single edge-triggered pulse generator. The proposed new double edge-triggered pulse generator uses the pulse generation logic, which is used to share many numbers of flip-flop results at low power. In this article, circuits with low power, low heat generation, and increased durability are achieved.

Keywords

Flip-flop, power dissipation, pulse generation, complementary metal-oxide semiconductor

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Research paper

Spectrum-aware shared protection (SASP) algorithm for cognitive radio networks

Mr. S. Esakki Rajavel [1] *, Dr. T. Aruna [2], Mr. S. Allwin Devaraj [3]

[1] *Assistant Professor, Department of ECE, Francis Xavier Engineering College, Tirunelveli*
[2] *Assistant Professor, Department of ECE, Thiagarajar College of Engineering, Madurai*
[3] *Assistant Professor, Department of ECE, Francis Xavier Engineering College, Tirunelveli*

Abstract

Cognitive radio (CR) has become a key technology for addressing spectrum scarcity. In CR networks, spectrum access should not interfere the incumbent networks. Due to the requirement above, common control channel approaches, which are widely used in traditional multi-channel environments, may face serious CR long-time blocking problem and control channel saturation problem. Although channel-hopping-based approaches can avoid these two problems, existing works still have significant drawbacks including long time-to-rendezvous, unbalance channel loading, and low channel utilization. This paper tends to the issue of range mindful survivable methodologies with disappointment likelihood limitations under static activity in adaptable transfer speed optical systems. The joint disappointment likelihood amongst essential and reinforcement ways must be beneath the most extreme fair joint disappointment likelihood for each activity request. It creates whole number direct program (ILP) models for committed way security and shared-way assurance with a specific end goal to limit the aggregate number of recurrence spaces expended, and furthermore propose a range mindful devoted insurance (SADP) calculation and a range mindful shared security (SASP) calculation. This demonstrates the ILP show arrangements devour least number of recurrence spaces, however prompt higher normal joint disappointment likelihood contrasted with the SADP and SASP calculations. In addition, both the SADP and SASP calculations accomplish a superior execution as far as aggregate number of recurrence openings expended when contrasted with a customary devoted way insurance calculation and an ordinary shared-way assurance calculation, separately, however prompt higher normal joint disappointment likelihood.

Keywords: *Cognitive Radio; Spectrum-Aware Dedicated Protection (SADP); Frequency Slots and Shared-Path Protection Algorithm.*

1. Introduction

Inside the present range administrative structure, the majority of the recurrence groups are solely assigned to particular administrations, and infringement from unlicensed clients isn't permitted.The Federal Communications Commission (FCC) has indicated that the percentage of the assigned spectrum that is occupied only from 15 to 85 percent, varying widely in time and places. To address the critical problem of spectrum scarcity, the FCC has recently approved the use of unlicensed devices in licensed bands [1]. This new field of research foresees the development of cognitive radio networks (CRNs) to further improve the spectrum efficiency. nhancing the data transfer capacity effectiveness and diminishing the potential disappointment likelihood in adaptable transmission capacity optical systems are ending up progressively essential. Specifically, optical system survivability assumes a critical part in guaranteeing movement nature of administration. One approach for giving survivability is through insurance systems in which reinforcement assets are saved at the season of an association's foundation so as to ensure against failures [2].

Assurance systems can be delegated either devoted or shared insurance plans. Devoted assurance allots committed reinforcement assets to each activity request and is a viable system for giving quick recuperation disappointment movement. Shared insurance permits numerous working movement requests to share reinforcement assets as long as the essential ways don't bomb all the while. Shared insurance accomplishes preferable productivity of system assets over devoted protection [3].

When all is said in done, while security plans are successful in giving survivability against single-interface disappointment, they are less compelling in giving full survivability against numerous disappointments, especially if assets on both the working way and reinforcement way of an association flop at the same time. For this situation, another metric of intrigue is the joint disappointment likelihood of an association, which is the likelihood that both the working way and reinforcement way of an association come up short simultaneously [4]. This likelihood can be ascertained in view of the disappointment probabilities of individual fiber interfaces in the system and the courses taken by the essential and reinforcement ways. Every association may have a specific resilience to disappointment communicated as a most extreme decent joint disappointment likelihood (MJFP) limit, and this edge must be fulfilled while building up the essential and reinforcement paths.

Another essential issue in adaptable data transfer capacity optical systems is range proficiency. While provisioning assets for associations, it is frequently gainful to limit the measure of range assets devoured by the association. Limiting range utilization can lessen arrange costs and may enable the system to suit more movement. It address the issue of provisioning working and reinforcement assets for a static arrangement of association asks for in an adaptable data transfer capacity optical system with the objective of fulfilling the joint disappointment likelihood necessity of each demand while likewise endeavoring to limit range assets utilization. Specifically,

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LOW LATENCY IN MULTIMEDIA COMMUNICATION THROUGH WIRELESS NETWORK

***M.L.Jothi Alphonsa Sundari[1], * Mr.S.Esakki Rajavel[2], * Dr.T.Aruna[3],**

[1]M.E. Communication Systems, Francis Xavier Engineering College, Tirunelveli, Tamilnadu, (India)

[2]Assistant Professor, Department of ECE, Francis Xavier Engineering College,Tirunelveli,Tamilnadu,(India)

[3]Assistant Professor, Department of ECE, Thiagarajar College of Engineering, Madurai,Tamilnadu (India)

ABSTRACT

Multimedia services over mobile networks pose several challenges, such as the efficient management of radio resources or the latency induced by network delays and buffering requirements on the multimedia players. In Long Term Evolution (OFDM) networks, the definition of multimedia broadcast services over a common radio channel addresses the shortage of radio resources but introduces the problem of network error recovery. In order to address network errors on OFDM multimedia broadcast services, the current standards propose the combined use of forward error correction and unicast recovery techniques at the application level. This project shows how to efficiently synchronize the broadcasting server and the multimedia players and how to reduce service latency by limiting the multimedia player buffer length. This is accomplished by analyzing the relation between the different parameters of the OFDM multimedia broadcast service, the multimedia player buffer length, and service interruptions. It is simulated to confirm how the quality of the multimedia service is improved by applying our proposals.

I . INTRODUCTION

Wireless communication is without a doubt a very desirable service as emphasized by the tremendous growth in both cellular and wireless local area networks (WLANs) (primarily, the ones that are compliant with the IEEE 802.11 family of standards, popularly known as Wi-Fi). However, these two radically different technologies address only a narrow range of connectivity needs, and there are numerous other applications that can benefit from wireless connectivity. The cellular networks offer wide area coverage, but the service is relatively expensive and offers low data rates: even the third generation of cellular networks (3G) offers (at best) low data rates (_2Mbps) compared to WLANs (>50Mbps for IEEE 802.11a and 802.11g and _100Mbps for proprietary solutions at the time of this writing). On the other hand, the WLANs have rather limited coverage (and the

Android Based Saline and Oxygen Control System

C.GANESH,
AP/ECE,
Paavai Engineering College,
Namakkal
csganesh86@gmail.com

Indumathi.S,
UG Student,
Paavai Engineering College,
Namakkal
indumathimastro@gmail.com

Megala.E.V,
UG Student,
Paavai Engineering College,
Namakkal
megalaev@gmail.com

Anandhi.M,
UG Student,
Paavai Engineering College,
Namakkal
anandhismartway@gmail.com

Abstract— In this project, we recommend an android based saline and oxygen control system to control the saline flow rate for the quick recovery of patients. Almost in all hospitals, a nurse is responsible for monitoring the saline fluid level and oxygen level continuously. But unfortunately, the viewer may forget to change the saline bottle at correct time. This may lead to several problems to the patients such as backflow of blood, blood loss, drop oxygen level etc. The design and execution of saline and oxygen flow controlling method employing liquid flow sensor, heart beat sensor, temperature sensor and pressure sensor. The Arduino Mega (2560) platform has been used as controlling unit for essential control along with a 4x4 matrix keypad which helps in setting the saline flow rate. LCD display is used to indicate the saline flow rate and oxygen rate and android phone is employed to set the flow rate remotely and it also enables in monitoring the saline flow rate though a SMS. It also monitors the heart beat and body temperature.

Keywords— Saline flow control, Oxygen flow control, Arduino mega, GPRS, Smart phone.

I. INTRODUCTION

The requirements for health care are speedily rising with the continuous growing of the world population. Incredible success in medical technology has been observed with the rapid advancement of sensors, Arduino and computers prompt development. Numerous technological revolution designs are taken for the advantage of medical service improvement. There have been researching and development of fluid monitoring and controlling device for the furtherance of people's health care. The amount of Normal Saline intake taken by patient is totally depends on biological condition of patient but normally it is between 1.5 to 3 liters per day for an adult. Oxygen flow intake is up to 2-4l/min. Generally, in hospitals flow level is supervised by nurses and patients relatives. There is always a need to check the saline level after certain time. Unfortunately during most of the time, the observer may forget to change the saline bottle at correct time due to their busy schedule. This may leads to several problems to the patients such as back flow of blood, blood loss etc. The existing system for flow monitoring is very time consuming and inopportune for nurses.

II. PROPOSED SYSTEM

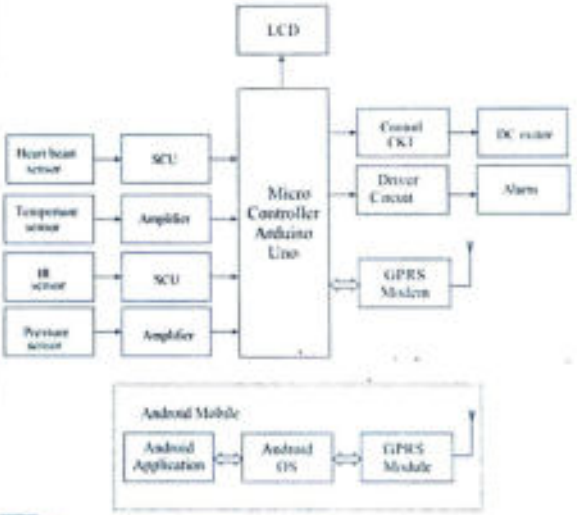

Fig.1. Block diagram

The proposed system of this paper is to detect and control the flow rate of saline and oxygen label correctly and give the signal to the doctor or nurse so that the amount of flow and pressure can be controlled using a smartphone and guide control. The system will be able to control the flow rate automatically allowing to the command given to the device by the user. Sensors will be developed to determine the rate. Once command will be given to the device it will continuously check the flow rate and balance with the command given by the user. A water drop flow detector sensor will detect the water drop accurately. Error reading can be determined by signal conditioning circuit and will be removed by an isolator circuit. The pattern is used to format your paper and style the text. All margins, column widths, line spaces, and text fonts are prescribed; please do not alter them. You may note peculiarities. For example, the head border in this template measures proportionately more than is customary. This measurement and others are

Arduino Based Liquor Detection and Automatic Vehicle Engine Locking with Location Tracking System

VIJAYKUMAR.S
AP/ECE
Paavai Engineering College
Namakkal

MUTHULAKSHMI.S
UG Student
Paavai Engineering College
Namakkal

ANUSURYA.C
UG Student
Paavai Engineering College
Namakkal

ANUSHIYA.M
UG Student
Paavai Engineering College
Namakkal

Abstract -In our project Arduino based automatic vehicle engine locking with location tracking system. We hear lots of accidents due to drunken driving. Drunken drivers will not be in stable condition and so rash driving causes inconvenience for other road users. In this project we are developing an Automatic engine lock system we are introducing a system that will detect drunken driver through alcoholic sensor through fitted on the steering .The controller keeps looking for the output from these sensors. If there are any traces of alcohol above the set limit, then the system will lock the engine.GPS and GSM are used to track the location and the system sends an alert to the owner on his mobile phone or mail as a short message (SMS). By implementing this system in the vehicle, a safe journey is possible, which would decrease the injuries during accident also reduce the accident rate. Additional features such as mobile call detector and vibration sensor are also included. The mobile call detector is used to detect the incoming and outgoing calls, SMS and video, etc., and vibration sensor is used for the indication of an accident to the police/ambulance.

Keywords- Arduino UNO Board, vibration sensor, Alcohol Sensor (MQ-6), Water valve, GPS module, GSM module.

Home Automation Based on Voice Recognition Using Arduino

S. SATHEESHKUMAR
AP/ECE
Paavai Engineering College
Namakkal
satheeshsankaranpec@paavai.edu.in

C.ARUNA
UG Student
Paavai Engineering College
Namakkal
arunasumathi2197@gmail.com

M.KEERTHANA
UG Student
Paavai Engineering College
Namakkal
keerthi.munusamy@gmail.com

R.LOGESHWARI
UG Student
Paavai Engineering College
Namakkal
logeshwarirameshslm@gmail.com

Abstract– This paper presents the design and implementation of home automation system that can be control via wi-fi technology through voice command. The design is based on arduino Uno. The important objective of this paper is to reduce the human effort, cost effective and provide more secure system. In this system smartphone is use to enable the authorized user to operate all home appliances. The project creates a user friendly interface for the smartphones that allow a user to communicate with the arduino. The advantage of using voice as an interfacing medium would help people with varied disabilities.

Keyword-smartphone, Arduino, wi-fi module, temperature sensor, relay.

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Morphological Filters Based Agile Detection of Diabetic Retinopathy Using OCT Images

P John Vivek
Assitant Professor
Department of ECE
Paavai Engineering College
Namakkal,Tamilnadu,India
johnvivek2020@gmail.com

S.Dharani
Department of ECE
Paavai Engineering College
Namakkal,Tamilnadu,India
dharanisabari97@gmail.com

J.Jeevitha
Department of ECE
Paavai Engineering College
Namakkal,Tamilnadu,India
jeevithajayaraman7@gmail.com

P.Keerthi
Department of ECE
Paavai Engineering College
Namakkal,Tamilnadu,India
keerthipalanisamy21@gmail.com

M.Jeevitha
Department of ECE
Paavai Engineering College
Namakkal,Tamilnadu,India
mjeevitha2498@gmail.com

Abstract — **Diabetic retinopathy is the cause for blindness in the human society. In this project primarily aims on the technique used to identify the initial diabetic occurrence in human being using the digital image processing .this project has listed different automated systems that distinguish normal and abnormal structure on the optic disk of an eye image. If any changes in blood vessels patterns in the retina we can easily identified the diabetic occurrence this technique used in automatic retinopathy and classify the exudates, hemorrhages. This paper deals with identifying retinal disease by image processing technique using morphological algorithms in OCT images.**

Index Terms— Retina blood vessels, digital image processing, morphological process.

I.INTRODUCTION

A digital image is fundamentally composed of a series of" pixels", a word derived from combining "picture" and "element". By choosing and brightening these individual pixels, a digital picture emerges .At face value, a digital image is nothing more than a slew of pixels set in some logical state. Three 8-bit numbers represent most color images with each octet corresponding to the amount of red,green, and blue in a pixel embodies. A gray scale image typically contains a sole 8-bit number to signify the amount of gray in a pixel. In addition to the color depth an image contains, the number of pixels or resolution is an additional image attribute .Common notation for an image's resolution is "MxN" where M represents the number of horizontal pixels and N represents the number of vertical pixels. Common examples include "800x600" or "2048x1536".

COAL MINING ACCIDENT RESCUE SYSTEMS

G.Mercy [1], M.Nandhini Priya [2], M.Preethiga [3], A.Samundeehswari [4]

[1to3]UG Scholor,ECE, Paavai Engineering College, Pachal, Namakkal

[4] A sst Professor, ECE, Paavai Engineering College, Pachal, Namakkal

mercychezhiyan@gmail.com,nandhinipriya.murugan121@gmail.com, preethigamurugan15@gmail.com, samundeeswariannaduraipec@paavai.edu.in

ABSTRACT

In wireless system, coal mining Disaster is a management systems that use in sensor networks. Software adopted ZigBee knowledge to form sensor networks, determined out actual observation with caution warning intelligence depending on temperature, leakage of gasoline in mining place, and notifying the succeed station the usage of wireless ZigBee knowledge. Changed situation parameters can be sensed by sensors, such as, high temperature. it useful for detecting a mining, forest and building fires, toxic gases affected by an burst, water level to prevent and detect the floods, vibration level to detect chocks and many other information. Sensors can offer extra useful services. Subscriber message knowledge concept enables universal connecting between one or many independent device with or without least human communication. By using RSSI communication method detecting the aliveness of the coal mining places disasters. The device also displays the LPG to leaks the convention of fuel recognition sensor, fireside the use of temperature sensor, in the mines and if it above the threshold degree, it alerts via alarm the usage of buzzer. This application is followed by ZigBee wi-fi technology to build a sensor networks, found out real-time observation with precaution-warning intellect based on temperature, dropout of gas in mining place, and warning the switch station the custom of wireless ZigBee technology. This technique allows the quick range of a person node to be accelerated and improved, covering a far larger region.

KEYWORDS- Disaster, ZigBee, Wi-Fi, Sensor Networks, Toxic gases, RSSI, Coal mining

I.INTRODUCTION

Coal Mining region the stage an significant role in India's overall advance. This region has well developed transportation and information and rich in mineral resources. This renowned coal attitude region has got very well reach for large industrial development along with other development of agriculture, livestock, forest, water and other minerals.

(12)

BOILER DRUM LEVEL CONTROL WITH ONE AND THREE ELEMENT STRATEGY USING PLC AND SCADA

S.Vimalnath,
AP I C I,
Paavai engineering college,
Namakkal,
s.vimal112@gmail.com

Afsar Ali.M.I,
Student,
Paavai engineering college,
Namakkal,
afsarali81900@gmail.com,

Gobikrishnan.V,
Student,
Paavai engineering college,
Namakkal,
gobikrishnan1998@gmail.com

Deepathkumar.V,
Student
Paavai engineering college,
Namakkal ,
deepathselvi@gmail.com

Abstract The main objective of our project is to maintain the boiler drum level, feed water flow and outlet steam flow from the boiler using cascade controller by applying a bias calculation and a compensated steam flow and the design have been stimulated using Programmable Logic Controller (PLC) and interfaced with SCADA (Supervisory Control and Data Acquisition).

Keywords—One Element, Three Element, Plc and SCADA

1. Introduction

A very common problem and one used in many examples elsewhere, is that of controlling the level in a boiler drum. Many industrial plants have boilers for generating process steam, and of course boilers are central to thermal power generation. The boiler drum is where water and steam are separated. Controlling its level is critical – if the level becomes too low, the boiler can run dry resulting in mechanical damage of the drum and boiler piping. If the level becomes too high, water can be carried over into the steam pipework, possibly damaging downstream equipment. The design of the boiler drum level control strategy is normally described as single-element, two-element, or three-element control. This article explains the three designs.

One of the main hazards in operation of recovery boilers is the smelt-water explosion. This can happen if even a small amount of water is mixed with the solids in high temperature. Smelt-water explosion is purely a physical phenomenon. The liquid - liquid type explosion mechanism has been established as one of the main causes of recovery boiler explosions. In the smelt water explosion even a few liters of water, when mixed with molten smelt can suddenly turn to steam in few tenths of a second. Char bed and water can coexist as steam blanketing reduces heat transfer. Some trigger event destroys the balance and water is evaporated quickly through direct contact with smelt. This sudden evaporation causes increase of volume and a pressure wave of some 10 000 – 100 000 Pa.

Proposed system

The proposed system of our project is to maintain the boiler drum level, feed water flow and outlet steam flow from the boiler using cascade controller by applying a bias calculation and an compensated steam flow and the design have been stimulated using Programmable Logic Controller (PLC) and interfaced with SCADA (Supervisory Control and Data Acquisition).

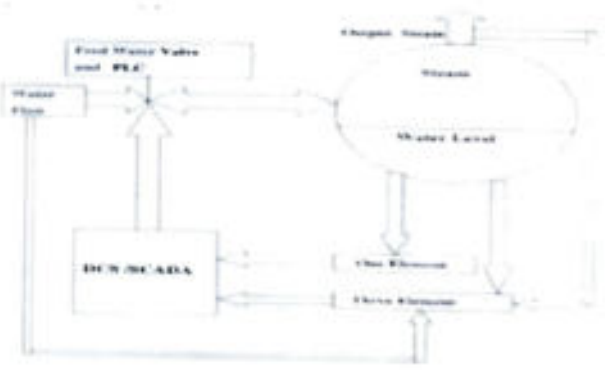

Figure 1: Proposed system block diagram

The proposed system of this paper outlines the various stages of operation involved in the conversion of a manually operated boiler towards a fully automated boiler. Over the years the demand for high quality, greater efficiency and automated machines has increased in this globalized world. The initial phase of the paper focuses on passing the inputs to the boiler at a required temperature, so as to constantly maintain a particular temperature in the boiler. The Air preheater and Economizer helps in this process. And the paper mainly focuses on level, pressure and flow control at the various stages of the boiler plant. Thus the temperature in the boiler is constantly monitored and brought to a constant temperature as required by the power plant. The automation is further enhanced by constant monitoring using SCADA screen which is connected to the PLC by means of communication cable.

International Journal of Engineering Research and Technology Science

SMART CONTROLLING USING IOT

* S LOGANATHAN [1], P. LOGESH [2], C. KARTHIK [3], V PURUSOTHAMAN [4]

Paavai Engineering College, Namakkal-637 018, India

Email: [1] logupaavai@gmail.com, [2]logeshmeena9@gmail.com

[3]karthikchandrasekaran1998@gmail.com, [4]purusothamanvc@gmail.com

ABSTRACT

The Smart Sensing Hardware – Sensor sends data through an Access Point through the firewall to the Cloud. From the Cloud, it is accessible by the user from any smart device. Ubiquitous sensing enabled by Wireless Sensor Network (WSN) technologies covers across many areas. This offers the ability to control and monitoring the electrical and electronics appliances. The proliferation of these devices in a communicating and actuating network creates the Internet of Things (IOT), wherein, sensors and actuators blend seamlessly with the environment around us, and the information is shared across platforms in order to develop a common operating picture (COP). This project presents a Cloud centric vision for worldwide implementation on Internet of Things. A Cloud implementation using Azure, which is based on interaction of private and public Clouds is presented. We conclude our IOT vision by expanding on the need for convergence of WSN, the Internet and distributed computing directed at technological research community (cloud).

Keywords—Internet of Things, IoT, Azure IoT Hub, Mobile Services, DHT11, Temperature and Humidity.

I. INTRODUCTION

The next wave in the era of computing will be outside the realm of the traditional desktop. In the Internet of Things (IOT) paradigm, many of the objects that surround us will be on the network in one form or another. Radio Frequency Identification (RFID) and sensor network technologies will rise to meet this new challenge, in which information and communication systems are invisibly embedded in the environment around us. This results in the generation of enormous amounts of data which have to be stored, processed and presented in a seamless, efficient, and easily interpretable form.

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CONSTRUCTIVE LEARNING OF PERIODIC ELEMENTS USING VIRTUAL REALITY

Daniel Ebenezer, Karthick.G, Karthikeyan.N[*1]
Mohanapriya.R[2]
[*1]Daniel Ebenezer, Karthick.G, Karthikeyan.N (UG Scholars, Department of ECE, Paavai Engineering College, Tamilnadu)
[2]Mrs.R.Mohanapriya (Assistant Professor, Department of ECE, Paavai Engineering College, Tamilnadu)

ABSTRACT
A new learning method using Virtual Reality [VR] is proposed with the help of UNITY software, to provide a better understanding for the problem in educational sector with the chosen part of the periodic table to control, combine and interact, helping the students to improve and experience in a meaningful way, academically. Virtual Reality [VR] provides an opportunity for constructional learning (i.e.) allowing students construct their own knowledge from meaningful experience. Low-performing students can also improve academically more than those learning in a traditional way.

KEYWORDS:
Virtual Reality, Unity Software, Periodic Table.

INTRODUCTION

Virtual Reality (VR) literally makes it possible to experience anything, anywhere, anytime. It is the most immersive type of reality technology and can convince the human brain that it is somewhere it is really not. Head mounted displays are used with headphones and hand controllers to provide a fully immersive experience. With the largest technology companies on planet earth (Facebook, Google, and Microsoft) currently investing billions of dollars into virtual reality companies and startups, the future of virtual reality is set to be a pillar of our everyday lives. The predominantly virtual spaces where real world objects or people are dynamically integrated into virtual worlds to produce new environments and visualizations where physical and digital objects co-exist and interact in real time is known as Virtual Reality.

An artificial environment which is experienced through sensory stimuli (such as sights and sounds) provided by a computer and in which one's actions partially determine what happens in the environment. Virtual reality (VR) refers to computer-generated environments or realities that are designed to simulate a person's physical presence in a specific environment that is designed to feel real. The purpose of VR is to allow a person to experience and manipulate the environment as if it were the real world. The best virtual realities are able to immerse the user completely.

Virtual reality should not be confused with simple 3-D environments like those found in computer games, where you get to experience and the environment through an avatar, rather than personally becoming part of the virtual world. VR aims to make you feel completely immersed in another world and blocks everything else out. It is a total virtual environment with none of the reality visible. The user is placed is in a completely different space from the actual location. The space is either computer generated or captured and video-recorded, entirely occluding the user's actual surroundings. VR technologies usually use compact, opaque head-mounted-gears.

A realistic three-dimensional image or artificial environment that is created with a mixture of interactive hardware and software, and presented to the user in such a way that the any doubts are suspended and it is accepted as a real environment in which it is interacted with in a seemingly real or physical way. Virtual reality (also called Virtual Realities or VR) is best understood by first defining what it aims to achieve – total immersion.

Total immersion means that the sensory experience feels so real, that we forget it is a virtual-artificial environment and begin to interact with it as we would naturally in the real world. In a virtual reality environment, a completely synthetic world may or may not mimic the properties of a real-world environment.

International Journal of Engineering Research and Technology Science

IJERTS

GREENHOUSE MONITORING AND CONTROLLING SYSTEM BY USING ANDROID

[1] Karthik.R, [2] Kaviyarasu.C, [3] Sakthivel.A, [4] Vanaja.C

[1to3]UG Scholar, ECE, Paavai Engineering College, Pachal, Namakkal

[4] Asst .Professor, ECE, Paavai Engineering College, Pachal, Namakkal

[1]ajaykarthik1013@gmail.com, [2] kavidhanush98@gmail.com,

[3] sakthivelanatham44@gmail.com, [4] vanajachinnappanpec@paavai.edu.in

ABSTRACT

Abstract— In agricultural country like India, greenhouses form a significant aspect of agricultural and horticulture sectors. In greenhouses, plants are grown-up under auspicious climatic conditions for its production and growth. Thus, monitoring and control of greenhouse environment is essential for production and management of greenhouses. This scheme is designed to monitor and control the covered humidity and weather conditions affecting the plants using embedded system and Android mobile phone. The android phone is linked to a central server which then attaches to microcontroller and humidity sensor through serial communication. Thus, the sensor archives and manages the required weather conditions proved to be appropriate for plant growth. In this scheme, we use GSM module to attach microcontroller &mobile phone. We use five categories of sensors to monitor the growth of the plants. The sensors are temperature, moisture, LDR, humidity, pH sensor. The sensor outputs are record & manage the require weather condition deliver to be suitable for plant growth.

Keywords—Sensor, embedded system, android mobile phone, GSM, microcontroller

INTRODUCTION

There is continuous growth in demand for food production technology. India is a country where the economy is dependent on agricultural yield. Agricultural means can satisfy the food production claim. But due to isotropic climatic situations, lack of water pool, agricultural yield does not meet the difficulties.

A greenhouse is a structure in which plants are grown for marketable or research purposes. These structures range in size from slight sheds to very huge buildings, with different types of layer materials, such as a glass or plastic ridge and commonly glass or plastic walls; it heats up because received visible solar radiation (for which the glass is translucent) from the sun is immersed by plants, soil, and other things inside the structure. Air warmed by the heat from hot interior surfaces is engaged in the building by the ridge and wall. In addition, the warmed structures and plants inside the greenhouse re-radiate some of their thermal energy in the infrared spectrum, to which glass is partially dense, so some of this energy is also surrounded inside the greenhouse. However, this later process is a minor player linked with the former (convective) process. Thus, the primary heating mechanism of a greenhouse is convection. Ventilation is one of the most significant components in a effective greenhouse.

International Journal of Engineering Research and Technology Science

AN EFFICIENT APPROACH FOR SEGMENTATION AND CLASSIFICATION OF BRAIN TUMOR MRI IMAGES

[1]Karthikeyan.R, [2]Manivanan.M, [3]Mukeshkumar.R, [4]Dr.S.Kumarganesh

[1to3]UG Scholar, ECE, Paavai Engineering College, Pachal, Namakkal

[4]Professor, ECE, Paavai Engineering College, Pachal, Namakkal

[1]karthirama23@gmail.com, [3]mukeshkumar71998@gmail.com

ABSTRACT

The identification, segmentation and detection of infecting area in brain tumor MR images are a tiresome and time consuming task. The diverse analysis structure of human body can be visualized by an image processing concepts. It is very complex to have idea about the irregular structures of human brain with simple imaging techniques. Magnetic resonance imaging technique distinguishes and clarifies the neural structural design of human brain. MRI technique contains many imaging modalities that scans and confine the internal structure of human brain. In this study, we have intense on noise removal technique, withdrawal of gray-level co-occurrence matrix (GLCM) features, DWT-based brain tumor region mounting segmentation to decrease the complexity and develop the performance. This was followed by morphological filtering which removes the noise that can be twisted after segmentation. The probabilistic neural network classifier was used to instruct and check the performance accuracy in the detection of tumor position in brain MRI images. The experimental results achieved nearly 100% accuracy in identifying ordinary and unusual tissues from brain MR images representing the effectiveness of the proposed technique.

Keywords— Image segmentation, MRI, DWT, Morphology, GLCM, PNN

I.INTRODUCTION

In image processing, images transmit the information where input image is processed to get output also an image. In today's humanity the images used are in digital format. In modern times, the introduction of information technology and e-healthcare system in medical field helps clinical experts to offer better health care for patients. This study reveals the problem segmentation of unusual and usual tissues from MR images using gray-level co-occurrence matrix (GLCM) quality extraction and probabilistic neural network (PNN) classifier. The brain tumor is an irregular growth of abandoned cancerous tissues in the brain. A brain tumor can be gentle and cruel. The gentle tumor has uniformity structures and contains non-active cancer cells. The cruel tumor has non-uniformity structures and contains active cancer cells that stretch all over parts. According to world health organization, the grading system scales are used from grade I to grade IV. These grades

IJERTS

International Journal of Engineering Research and Technology Science

AN EFFICIENT INVESTIGATION OF HUMAN STRESS BY USING SUPPORT VECTOR MACHINE (SVM)

[1]Nandhini.T, [2]Pragathi.V, [3]Shanmugapriya.A, [4]Dr. S.Kumarganesh

[1to3]UG Scholor,ECE, Paavai Engineering College, Pachal, Namakkal

[4]Professor, ECE, Paavai Engineering College, Pachal, Namakkal

[3]shanmukalai55@gmail.com, [1]nandhu.thangaraj1998@gmail.com

ABSTRACT

Signal analysis using medical imaging is an important process. The function of the brain and heart is also very essential. If the brain is not properly functioning, there occur some problem it cannot functions well. The function of the heart is also very essential. If the heart functions properly, then the blood circulates throughout the body with help of systolic and diastolic process. Suppose if it is affected by any fact content, the blood gets clotted and it cannot function well and occur some problem. In other terms our minds get diverted and mentally disturbed from stress. So the detection of heart beat level is required to monitor the stress and heart beat level.

Keywords: Imaging, brain, heart, systolic, diastolic, stress, heart beat level

I.INTRUDUCTION

Psychological stress is a phenomenon related to thoughts, emotion, physiological changes and everyday social activities. High level of psychological stress can cause health related problems. It has been observed in recent researches that high level of mental stress adversely affects cardiovascular, endocrine and immune system health, etc. and psychological health (Cohen et al., 2007). Stress is surveyed to be an unavoidable aspect of college student's life. A survey conducted by Nightline Association reported about 65% of university students observe some kind of mental or psychological stress in their daily academic and other activities (Zheng et al., 2016). Cognitive as well as physical performance can also be affected due to daily stress conditions. High risk professions, such as defense services, industrial process plants, vehicle, locomotives and flight operation and control are more prone to get affected due to high stress condition and can be highly dangerous (Driskell et al., 2013).

Diagnose and measurement of stress level profiles; quantitatively and qualitatively with abnormality spotting can be achieved by majorly three methods: task oriented, questionnaire based and physiological parameters assessment based evaluations. Psychological questionnaire based methods are widely used to examine the stress profile, but this is mostly only empirical to subject's response and is prone to misrepresentation or manipulation, and it can result to incorrect measurement. Also, evaluation requires an

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An Enhanced Technique of an Electronic Walking Stick for Blind Person

S.VIJAYAKUMAR
AP/ECE
Paavai Engineering College
Namakkal

R.SHANKARI
UG Student
Paavai Engineering College
Namakkal

K.PRIYADHARSHINI
UG Student
Paavai Engineering College
Namakkal

K.SANGEETHA
UG Student
Paavai Engineering College
Namakkal

Abstract-This technique detail about smart walking stick with voice playback unit. Now a day's blind person used a stick to find the obstacles appearing in front of them. But this stick is incapable of various features and the person using it has to face many problems. The most important objective of this project is to provide the safety detection for while moving outside. The smart walking stick is more innovative other than standard walking stick as the use of different sensors makes object identification easier. The voice playback aids the blind person to take convenient steps to reach the target.

Keywords -ATmega328, ultrasonic, water detector, vibration, GSM, RS232 cable.

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ETP REMOTE MONITORING PROCESS

S. VIJAYAKUMAR
AP/ECE,
Paavai Engineering College,
Namakkal

RISHIKESHAN.G
UG Student,
Paavai Engineering College,
Namakkal

NAVEEN.M
UG Student,
Paavai Engineering College,
Namakkal

Abstract- In this project, we are going to monitor some parameters from the treated water of an industry (TAMILNADU NEWSPRINT AND PAPER LIMIT). All the usage water not suit for all the process, The sensors generate water flow quality data including pH, COD (Chemical Oxygen), BOD & TSS. These real time results are directly transferred to the TNPCB (Tamilnadu Pollution Control Board). Each an every parameter has a limit measurement (TNPCB Limit), in case it cross the particular level means TNPCB will send a warning alert. The unclean water will generate from the process of taking "White Liquor" which is provide polishness to the paper. The treated water should suit for the plantation, it mustcontain oxygen and natural pH level.

*Key words-*Water pollutions, parameter monitoring

1. INTRODUCTION

Water constitutes is an essential element of life (Topfer, 1998). The entire history of mankind could be written in terms of need for water. Early civilization flourished along river valleys was there is abundant water to support life. In our contemporary world, noted cities are located on great river courses, harbors, estuaries, lagoons and sea fronts (Sonuga, 1984). An adequate supply of safe, clean water is regarded as the most important for sustaining human life, for maintaining ecosystems that support all life and for achieving sustainable development (Topfer, 1998). Process of cleaning water is essential for addressing poverty and health problems. It has been confirmed without

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MONITORING OF SMART GRID UNCERTAINITIES USING IMAGE PROCESSING

T.LOGANAYAGI
AP/ECE,
Paavai Engineering College,
Namakkal
t.loganayagi@vamil.com

V.SUVETHA
UG Student,
Paavai Engineering College,
Namakkal
suvethavetrivel1997@gmail.com

R.TAMILSELVI
UG Student,
Paavai Engineering College,
Namakkal
tamizhrajendran11@gmail.com

M.VANITHASHREE
UG Student,
Paavai Engineering College,
Namakkal
vanimurugesan97@gamil.com

AbstractGenerally electricity has been produced and available in societies whenever consumers needed it. In some years we expected that the future of smartgrids will emerges the increasing usage of information and communication technologies. When it will happen new challenges within the grid may occur, one of these are balancing electricity consumption and production. The secondary is power losses, so in that fault clearance and detection in the distributing electric lines are the major issues. In this project we addressed the problem of power uncertainties using image processing techniques. Effective monitoring and maintenance of power lines are needed, we are using image processing techniques by replacing electromechanical switch gear system. Through VLSI and DSP technologies, the fault parameter can be analysed in the thermal image which is captured by thermal camera. The collected image database is given to processors which automatically activate the controller.

Keywords: -Smart grid, Power system uncertainties, VLSI and DSP techniques, Electromechanical switch gear system, image processing techniques.

IJERTS

International Journal of Engineering Research and Technology Science

AN INTELLIGENT ROBOTICS SYSTEM FOR PICKING UP OF FLOWERS AND VEGETABLES

D.Niranjana[1], M.Pandipriya[1], V.Prabhavathi[1],S.Vimalnath[2]

[1&3]UG Scholor,ECE, Paavai Engineering College, Pachal, Namakkal

[2]A sst Professor, ECE, Paavai Engineering College, Pachal, Namakkal

ABSTRACT

Humankind has always struggled to give life like qualities to its handicraft. In an aggressive environment it works, in an attempt to find surrogate for himself to carry out his orders. A Robot works as a human.In current state the industries move on automation in robotics to increases productivity and delivery uniform quality. Codification of robotics are commonly used in industries is manipulated, a robotic arm know as place and pick robot. It is open or closed mechanics chain. It rigid link connected by movable arm. In this project, place and pick robot is being plot by Bluetooth and ATmega328 microcontroller. The arm capture the object by using android application.

KEYWORDS-Robotic arm, Microcontroller(ATmega328), Bluetooth module,DC motor.

I.INTRODUCTION

Place and Pick robotic system is the act of picking up and placing down. It is widely used in industries. Robotic is a limb of physical engineering science and technology.The robotics minimize the human efforts in the tricky operations for lifting heavy weights.For examples in manufacture unit,to pick the items from the conveyer belt and place those for packaging is done by robotics.It is a reprogrammable,multifunctional manipulator designed to move the parts,item, and many special things based on the programmatically motion to perform different tasks.In a monotonous task to be done in many times and where rightness should be maintained every time in single task.While execute the robotic system,the cost also will be dominant cover based on the function.

II.EXISTING SYSTEM

In the existing system complex mechanisms are used for place and pick operations. The existing system has a very low success rate . And the objects that can be arm by the robot are of definite shape. Hence there are several constnts in the existing system of place and pick robot.

III.PROPOSED SYSTEM

In the proposed system the place and pick robotic arm, according to cost the size of arm will vary .In our system, we are execute a robotic manipulator which can hold small items with

PREVENTION OF CAPTURING PIRACY VIDEOS

RAVISHANKAR KANDASAMY
AP/ ECE,
Paavai Engineering College,
Namakkal
kandasamyravishankar@gmail.com

V. NARMADHA
UG Student,
Paavai Engineering College,
Namakkal
Narmadhav20@gmail.com

C. PRIYADHARSHINI
UG Student,
Paavai Engineering College,
Namakkal
dharshini9797@gmail.com

Abstract-In the present scenario, taking piracy videos has great impact on the motion picture industry. According to Motion Picture Association of America (MPAA), Hollywood loses billions of dollars a year on illegally sold copies of movies. We present a new video projection technique to defeat taking piracy video in movie theaters using infrared light. The directed infrared light causes strong reduction in the quality of the image. It's not interfere with camera's operation and it harmless to the camera user. It is connected to a microcontroller which helps in altering the radiations frequency and wavelength characteristics. It is mainly done to neglect the use of infrared filters by a person while capturing the film using a camera. As infrared has a large bandwidth a person could have to use a large number of filters to neglect the effect of IR, which is not feasible or possible.

An IR light is fixed behind the screen so that the piracy videos cannot be taken, since the IR light is invisible to the human eyes and visible to the camera. The reason behind is that the human eye has the visible length of 390nm to 700nm while the IR light have a range of 700nm to 1mm. The video frames captured by camera will contain infrared light waves while passing infrared light on the screen. This helps theatre owners and movie investors.

Keywords: -Infrared LED, video projection technique, quality of the image

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High Security Voice Recognition Based Bank Locker Alert System with Live Image

R.BOOMIDEVI
AP/ECE
Paavai Engineering College
Namakkal

R.SUSMITHA
UG Student
Paavai Engineering College
Namakkal

R.SUDHA
UG Student
Paavai Engineering College
Namakkal

K.VIJAYALAKSHMI
UG Student
Paavai Engineering College
Namakkal

Abstract-Bank lockers is a financial institution to store our valuables. The high authentication factors are used to safeguard their accessories like cash, documents, gold etc. In today's life, there is a stipulation for high authenticated bank security system and to abstain from the unofficial person. We produce a system with voice recognition, face detection, and GSM technology. The program is developed in a microcontroller using MATLAB software, where it to examine the user's face. The MATLAB is demonstrated in that way and it constraint with these 15 set of images. On that condition, if it matches the system will be unlocked and if not, it will dispatch. This setup will accomplish a superior explication for reliability.

Index Terms-Voice Recognition, Face Detection and GSM Technology.

Design and Implementation of IoT Based PAAVAI Smart Laboratory

N.Nandhini(nandhunata@gmail.com),

paavai engineering college

M.Sathya(satjoh23@gmail.com),

paavai engineering college

S.K.Vinotha Priya(priyap0220@outlook.com),

paavai engineering college

MS.R.Mohana Priya (mohanapriya.ramalingampec@paavai.edu.in)

paavai engineering college

ABSTRACT

Internet of things is an innovation in which devices are coordinated with the virtual universe of the internet and collaborate with it by tracking, sensing and monitoring objects to communicate with each other. On this thesis, an integrated framework for smart campus towards internet of things based on ZigBee wireless sensor network is presented. The system is proposed to be retrofitting to the existing system of campus. The Paavai smart campus uses smart devices to gather valuable information with the assistance of different existing advances and after that self-ruling stream of the information between different devices to create smart campus which includes smart environment, smart parking, smart security, smart building, smart office and classroom. A design is proposed which supports of all the components of the campus and a simulation is done to show the feasibility of the proposed system.

Keywords: -Internet of things, ZigBee, Wireless sensor network

INTRODUCTION

The Internet of Things (IoT) is the chain of environmental commodity appliance, automobile, buildings and actuators, software, sensors, and their connectivity. The IoT allows objects to be anticipate remotely across existing network base, creating a direct communication to the environmental world into computer-based systems, and resulting in improved security, well decision making and economic benefit in addition to improving human day to day activity [1][2]. According to ISOC, Internet of things refers to scheme where network connectivity and computing capability extends to devices, sensors, actuators, and everyday items not normally considered computers, allowing these devices to generate, exchange and consume data with minimal human intervention [3]. IoT systems allow users to attain immense computerization, analysis, and consumption within a system. They improve the reach of these areas and their accuracy. IoT utilizes existing and emerging technology for sensing, networking, and robotics [7].

Moreover, by enabling easy entry and communication with a wide array of devices such as, for instance, home tools, surveillance

IOT BASED TOLL BOOTH MANAGEMENT SYSTEM

Sakthivel.V,
AP/ECE,
Paavai engineering college,
Namakkal,
sakthivel0098@gmail.com

Prathap.R,
Student,
Paavai engineering college,
Namakkal,
raviprathap9585@gmail.com,

Yoga vignesh.S,
Student,
Paavai engineering college,
Namakkal,
yogavignesh8@gmail.com

Manivasakan.E,
Student,
Paavai engineering college,
Namakkal ,
manivasakan944@gmail.com

Abstract— Nowadays almost all highways toll plazas are manually operated, where an operator collects cash from the driver and provides a receipt. Since this procedure can be slow, we often encounter traffic jams at the toll plazas on busy highways. IoT based toll collection will save time, effort and man power. In this work propose a low cost and efficient technique called Electronic Toll Collection using RFID modules that automatically collects the toll from moving vehicles when they cross the toll plaza and send the toll amount details owner mobile using IoT (Wi-Fi). We also assume that an owner maintains a prepaid account, so that toll tax is deducted automatically from the driver's account at toll plaza. If the balance in the owner's account is low or vehicle over load if the vehicle is not equipped with an RF system, the toll gate remains

close. In such a case vehicle owner will have to pay the toll tax in cash and collect the receipt. How many vehicles passing through the toll gate stored in a database. We can also find out a vehicle how many times passing through the toll gate in a day. Through this process of toll collection will save time, effort and man power.

Keywords—RFID, Wi-Fi module, LCD Display,

Relay, Alarm, IR Sensor.

INTRODUCTION

The automatic toll e-ticketing system is the approach used for the vehicle when it reaches the toll plaza, this is detected by using Infrared Proximity Sensor. RFID tags are used to read each vehicle with the help of RFID reader. An IR receiver is used to receive these pulses and sends it to a controller (MSP 430 Launch pad), which then transmits the vehicle number through the IR transmitter located in vehicle. We assume that vehicles have 16-bit identification numbers. The RFID tags to readers read the signal and information about vehicles owners. These IR signals are received by an IR receiver at the toll plaza, which send data to a computer's parallel port. A software program running on the computer retrieves vehicle details from its vehicle database. Depending on this information, appropriate toll tax is deducted from the pre-paid account of the vehicle's owners. Next method proposes a very simple method for enhancing the performance of infrared electronic-toll-collection systems, in such a case, the vehicle owner

An Enhanced Incremental Conductance Algorithm for Photovoltaic System

K. Ramesh, R. Giri Ganesh, Sri Lakshmi Vineela Reddy, K. Mahalakshmi and S. Suganya

***Abstract*—The energy obtained from the photovoltaic array is dependent on the available solar insolation, the panel tilt angle and the power point tracking algorithm of the system. Some of the Conventional MPPT methods are developed by considering uniform solar irradiance. During partial shading conditions, solar panel may produce multiple Local Maximum Power Points (LMPPs) in its power voltage characteristic curve. A new algorithm has been developed in this paper by using sequential sampling embedded with existing incremental conductance procedure in order to predict the Global Maximum Power Point (GMPP). The tracking capability of proposed algorithm is verified with simulation works carried out in MATLAB/SIMULINK. The results of proposed algorithm are likened with the results classical Perturb and Observe (P&O) and Incremental Conductance algorithms.**

***Index Terms* — Global Peak (GP), Photovoltaic (PV), Maximum Power Point Tracking (MPPT), Incremental Conductance, Single Ended Primary Inductor Converter (SPEIC).**

Original Research Paper
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I. Introduction

Power demand is increasing nowadays because of increase in population and to satisfy their needs. Along with conventional energy sources, other energy sources such as the solar energy, bio-mass energy, wind energy etc. contribute to meet out the power demand conditions. These additional energy sources have gained huge interest due to environmental issues and looking for low-cost energy. [1-3] Solar energy is the united with the power and heat of the sun's rays. Solar energy is clean and available in most of the places. Photovoltaic energy conversion is the simple process and a smart method of converting the incident sun irradiance into an electrical energy [23] with the help of solar cells. As like other energy generation units, it won't produce any noise, pollution and it is robust and reliable. These PV panels consist of semiconductor materials and it producing electrical energy when it is subjected to sunlight and its output depends on forbidden energy gap level of semiconductor material used in PV panel. PV cell's output efficiency characteristics depends on solar intensity, temperature and resistance [17]. To achieve the maximum output efficiency condition, a control strategy known as maximum power point tracking (MPPT) is needed to identify the PV operating point that allows extraction of maximum power from the array.

In literature, many MPPT methods have been reported, including current mode model, [5] voltage operating mode, [25] Peak converter with Predictive Digital Current Control, [27] Hill Climbing, [2], [7] Incremental Conductance, [4], [20], [23] Perturb and Observe, [3] Particle Swarm Optimization, [13] and Neural Network [11]. These algorithms give better result when the PV modules are subjected to uniform solar irradiation. This process gives only one MPP in its P-V characteristic curve with respect to given temperature and insolation. Because of the conflict in tracking the Global MPP (GMPP) under multiple local maxima with partial shading condition, the above mentioned conventional algorithms results in PV systems with lower conversion efficiency.

Several solutions have been proposed, to verify the effectiveness of MPPT algorithms even under partial shading condition, with some modifications made on conventional algorithms. A modified Perturb & Observe (P&O) algorithm reported by Abdelsalamet.al. [26] does not need any predefined system dependent constants and it confirms the adaptive tracking and zero steady state oscillations about the MPP. In this method, adaptive perturb is generated with the help of PI control action. In the modified incremental conductance algorithm [4], a simple linear equation that tracks the GMPP dictates the terminal voltage of the panel according to the MPP voltage obtained using incremental and instantaneous conductance of the PV module. This method requires additional circuits at the output of the converter.

Some methodologies [8]-[10], [14] have been presented to improve the efficiency of the solar PV modules even under partial shading condition and are results in significant reduction in overall cost. In the method proposed by Carlos Olalla [8], the converter is designed to process only mismatch fraction of power

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K. Ramesh is with the Faculty of Electrical Engineering, Department of Electrical and Electronics Engineering, Kuppam Engineering College, Kuppam, Andhra Pradesh, India. phone: +91-9652074806; e-mail: drramkomar@gmail.com).

Giri Ganesh is with School of Electrical and Electronics Engineering, SASTRA University, Thanjavur, Tamilnadu, India.

Sri Lakshmi Vineela Reddy is with Department of Electrical and Electronics Engineering, Madanapalle Institute of Technology and Science, Madanapalle, Andhra Pradesh, India.

Sri Lakshmi Vineela Reddy is with Department of Electrical and Electronics Engineering, Madanapalle Institute of Technology and Science, Madanapalle, Andhra Pradesh, India.

K. Mahalakshmi is with Department of Electronics and Communication Engineering, Kuppam Engineering College, Kuppam, Andhra Pradesh, India

S. Suganya is with Department of Electrical and Electronics Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India

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ANALYSIS OF CHEMICAL CELLS IN DIFFERENT ASPECTS FOR OFF-GRID ENERGY SYSTEMS

M. Chandrabose[1], B. Muralibabu[2]

[1]Student, Department of EEE & Paavai Engineering College, Namakkal, Tamil Nadu-6370 018, India.
[2]Professor, Department of EEE & Paavai Engineering College, Namakkal, Tamil Nadu-6370 018, India.

Abstract - *Different battery chemistries fit different applications, and certain battery types stand out as preferable for stationary storage in off-grid systems. Rechargeable batteries have widely varying efficiencies, charging characteristics, life cycles, and costs. This paper compares these aspects between the lead-acid and lithium ion battery, the two primary options for stationary energy storage. The various properties and characteristics are summarized specifically for the valve regulated lead-acid battery (VRLA) and lithium iron phosphate (LFP) lithium ion battery. The charging process, efficiency, and life cycle are discussed for each battery type. Through cost analysis specifically, lithium ion batteries are shown to be a cost-effective alternative to lead- acid batteries when the length of operational life – total number of charge/discharge cycles – is considered. Finally, applications for off-grid applications and specifically developing world microgrids are discussed.*

Key Words: Batteries, Lithium Batteries, Lead-Acid Batteries, Energy Storage, Microgrids, Valve Regulated

Lead-Acid (VRLA).

1. INTRODUCTION

The rechargeable electric battery is the most common and widespread device used to store electrochemical energy for power systems. Fundamentally, a battery is a combination of electrodes soaked in an electrolyte substance that enables an ion exchange to happen so as to conduct electricity. Recent years have seen continuous improvements in battery technology, and improvements continue in the fields of battery safety, reliability, performance, efficiency, cost and capacity. Two major types of battery technology are used in power applications: lead-acid and lithium ion (Li-ion). In off-grid power systems, distinct base load and peaking power plants are generally unavailable. Generation sources are generally few and increasingly sporadic given the recent propagation of intermittent renewables like solar and wind.

If backup or reserve generation is available at all, the options off the grid are generally expensive and/or oil-burning, e.g. diesel generators. Stationary storage can eliminate the need for such backup options and provides a renewable alternative to burning fuel. Banks of lead-acid batteries are used most commonly for off-grid stationary energy storage. Li-ion batteries work longer in operation (more charge-discharge cycles than lead-acid) but are often avoided in budget-constrained systems off-grid because Li-ion are more expensive per kWh of storage capacity.

Lead-acid batteries, being the older technology, are widely used and comparatively big and bulky. They are easy to install and have low upfront and maintenance costs. Performance of lead-acid batteries is depends largely on ambient temperature and the discharge rate, which is controlled by a system's power electronics. Lead-acid batteries are made up of plates of lead and plates of lead dioxide, all immersed in an electrolyte solution of sulfuric acid and water. When discharging the process involves electrodes turning into lead sulphate, whereas the electrolyte that is sulphuric acid becomes primarily water. A single cell of lead-acid is capable of producing 2.15V [2], [3]. Two types of lead-acid batteries dominate the market – flooded and valve regulated lead-acid (VRLA). This paper focuses primarily on VRLA since – by contrast with flooded – this type has a lower chance of cell failure and does not require addition of handling acid or water. Furthermore, degradation from hydrogen evolution during float is lower in VRLA than in flooded lead-acid by a factor of 10 [4].

Li-ion batteries rely on newer chemistry that improves on lead-acid and other batteries previously available on the market. Li-ion batteries are mainly used in portable electronics because of their durability, compact and lightweight form factor, fast charge/discharge rate, long life, and higher efficiency than lead-acid. The downside, though, is that the cost per unit energy (kWh) is typically at least twice as high for Li-ion batteries as for lead-acid. Li-ion uses the transfer of lithium ions from anode to cathode when storing energy (charging) and the reverse direction when discharging. The two primary chemistries available for Li-ion are lithium iron phosphate (LiFePO4, i.e. LFP), nickel cobalt manganese (NCM), and lithium titanate oxide (LTO). For our comparative review of lead-acid and Li-ion, we focus on LFP rather than LTO, as LFP has a lower cost per kWh [2], [3], [5].

Many factors are important to consider when choosing which battery type is best for a specific application. This paper is a review of prior work describing several such factors as they differ between lead-acid and Li-ion batteries. Section II gives an overview of lead-acid batteries, section III does the same for Li-ion batteries, and section IV focuses on key differentiators that show which battery type is

Anfis Based Mppt Control Of A Stand - Alone Hybrid Power Generation System

T.Karthic, A.Rathinam
[1]Student, [2] Professor,
[1]Power System engineering,
[1]Paavai Engineering College, Namakkal, India

Abstract—**This research study presents the fuzzy space vector pulse width modulation (FSVPWM) method of current control for three-phase voltage source inverter. The hybrid fuzzy particle swarm optimization-based maximum power point (MPP) tracking algorithm has been employed to obtain high tracking efficiency as well as optimal MPP under adverse operating states. The FSVPWM technique provides less current harmonic content, fixed switching pattern, protection from over current, low switching losses and able to handle the non-linearity's and uncertainties of the photovoltaic-wind grid integrated system. Grid synchronization with sinusoidal current injection is achieved using the inverter controller. Most studies on tuning of fuzzy inference are concerned with numerical inputs and outputs only, and very few research has been done on tuning of fuzzy inference with fuzzy inputs and outputs. Moreover, in many cases the object of tuning are fuzzy predicates only, apart from the other factors intervening in fuzzy inference. In this paper we propose a method to tune the fuzzy inference when inputs and outputs are given as fuzzy sets. This method is similar to back propagation and tunes the parameters of aggregation operators, implication functions and combination functions as well as the fuzzy predicates which appear in the nodes of the network representing the calculation process of thc fuzzy inference Fuzzy logic controller-based SVPWM controller compensates current error and provides DC-link utilization with high efficiency. The experimental responses have been validated using MATLAB/Simulink interfaced real-time SPACE DS 1104 controller. Irrespective of solar irradiance and wind velocity, the proposed hybrid system obeys MPP accurately with high performance.**

I. INTRODUCTION (HEADING 1)

A hybrid system is a dynamical system that exhibits both continuous and discrete dynamic behavior – a system that can both flow (described by a differential equation) and jump(described by a state machine or automaton). Often, the term "hybrid dynamical system" is used, to distinguish over hybrid systems such as those that combine neural nets and fuzzy logic, or electrical and mechanical drivelines. A hybrid system has the benefit of encompassing a larger class of systems within its structure, allowing for more flexibility in modeling dynamic phenomena.

In general, the state of a hybrid system is defined by the values of the continuous variables and a discrete mode. The state changes either continuously, according to a flow condition, or discretely according to a control graph. Continuous flow is permitted as long as so-called invariants hold, while discrete transitions can occur as soon as given jump conditions are satisfied.

II. SOLAR

III. WIND

2.HYBIRD SYSTEM

2.1 SOLAR

In this project Solar cells, also called photovoltaic (PV) cells by scientists, convert sunlight directly into electricity. PV gets its name from the process of converting light (photons) to electricity (voltage), which is called the *PV effect*. The PV effect was discovered in 1954, when scientists at Bell Telephone discovered that silicon (an element found in sand) created an electric charge when exposed to sunlight.

Traditional solar cells are made from silicon, are usually flat-plate, and generally are the most efficient. Second-generation solar cells are called thin-film solar cells because they are made from amorphous silicon or non silicon materials such as cadmium telluride. Thin film solar cells use layers of semiconductor materials only a few micro meters thick. Because of their flexibility, thin film solar cells can double as rooftop shingles and tiles, building facades, or the glazing for skylights.

Third-generation solar cells are being made from a variety of new materials besides silicon, including solar inks using conventional printing press technologies, solar dyes, and conductive plastics. Some new solar cells use plastic lenses or mirrors to concentrate sunlight onto a very small piece of high efficiency PV material. The PV material is more expensive, but because so little is needed, these systems are becoming cost effective for use by utilities and industry

Solar photovoltaic modules are where the electricity gets generated, but are only one of the many parts in a complete photovoltaic (PV) system. In order for the generated electricity to be useful in a home or business, a number of other technologies must be in place.

2.2.1MOUNTING STRUCTURES

PV arrays must be mounted on a stable, durable structure that can support the array and withstand wind, rain, hail, and corrosion over decades. These structures tilt the PV array at a fixed angle determined by the local latitude, orientation of the structure, and electrical load requirements. To obtain the highest annual energy output, modules in the northern hemisphere are pointed due

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GRID INTEGRATED SINGLE PHASE PV WITH SHUNT ACTIVE FILTER BASED CONTROL FOR DISTRIBUTED SYSTEM

N. THILAGA[1], Dr. G. BALAJI[2]

[1]Student, Department of Electrical and Electronics Engineering, Paavai Engineering College
[2]HOD, Department of Electrical and Electronics Engineering, Paavai Engineering College

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Abstract - *The grid integration is a framework which is used to evaluate a power system with high penetration levels of variable renewable energy. This is established to build generation and transmission capacity, ideally capturing the spatial diversity benefits of solar resources. The grid integration of renewable energy sources depends on the scale of power generation. The small scale power generation is connected to distributed systems and large scale power generations are connected to transmission systems. The conventional passive filter is necessary to insert between the inverter and the utility grid in order to filter the harmonics produced by the inverter. There are three types of passive filter: the L filter, the LCL filter. Nowadays, the LCL filter is vastly used than the others because of its filtering efficiency.*

Key Words: LCL filter, harmonics, shunt active filter

1. INTRODUCTION

Power quality refers to the ability of electrical equipment to consume the energy being supplied to it. A number of power quality issues including electrical harmonics, poor power factor, voltage instability and imbalance impact on the efficiency of electrical equipment. This has a number of consequences including

- Higher energy usage and costs
- Higher maintenance costs
- Equipment instability and failure

Energy management is an important consideration for any business, and it is critical that power quality be assessed as part of any energy management strategy.

Power quality issues fall generally into three broad categories

1. Harmonic voltages and currents- are introduced by a range of common electrical devices which distort the AC wave form and increases power usage. By introducing harmonic filters or reactors the harmonics are eliminated and the result is more efficient power usage and cost savings.

2. Poor power factor-refers to an excess of reactive power in the system. This reactive power does not perform any real work and as such is wasteful and costly. Power factor correction (PFC) reduces and can almost eliminate this reactive power, reduce energy costs and stop equipment over heating, nuisance tripping and motor failure.

3. Voltage instability- is in part a side effect of the high or low voltage electricity supply from the network. High voltage does not increase equipment power and is detrimental to equipment performance and longevity, and low voltage can cause brown outs and reduce productivity. Voltage optimization ensures the voltage supplied to the system is stable as required by the equipment on site.

Due to generator we had harmonics disturbance in the transmission line by implementing power quality improvement to rectify losses by harmonics compensation and power factor correction using active filters.

2. EXISTING SYSTEM

In the existing system an single stage, three phase grid connected solar PV (Photovoltaic) system. The MPPT (Maximum Power Point Tracking) based on P&O (Perturb and Observe) technique is used to obtain maximum power of the PV array. An adaptive Laguerre filter based control algorithm is used for the control of VSC (Voltage Source Converter). For sustaining the voltage of DC link with the reference value, a PI (Proportional Integral) controller is used. The behavior of the grid connected solar PV system is studied on a laboratory prototype. The performance of this system is demonstrated under non-ideal conditions where it performs satisfactorily for wide range of variations of load.

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Off-Grid Solar Power Bank

M. Karthikeyan[1], C. Arul Kumar[2], A. Rathinam[3]
[1, 2, 3]*Department of EEE & Paavai Engineering College, Namakkal, Tamil Nadu-6370 018, India.*

***Abstract:** In this paper, a single-switch two-stage DC-DC conversion circuit is proposed for an off-grid solar power application. A photovoltaic (PV) panel powers the load and a storage unit (battery) via the proposed circuit. The battery is designed to balance the supply and the demand of power under different irradiation situations. Based on conventional cascaded DC-DC converters, the proposed design is developed with the single switch technique reducing size, cost and power loss. The control scheme in this design is pulse width modulation (PWM) with pulse frequency modulation (PFM). The PWM module is similar to conventional design except its ramp signal with a variable frequency is provided by a resettable integrator. As a result, the PWM and PFM modules regulate the two stages of the proposed circuit separately with the same switching control signal. In this paper, the modes of operation of the circuit are discussed as well as the control schemes. The design process is described along with the circuit analysis and comparisons with conventional design are made as well. A prototype has been built to verify the proposed circuit with simulation and experimental results.*

***Keywords:** Single-switch technique, photovoltaic power system, off-grid solar system, DC-DC conversion, resettable integrator, pulse frequency modulation (PWM), pulse width modulation (PFM).*

I. INTRODUCTION

Renewable energy provides greater options addressing society concerns about the depletion of the fossil fuel. One source of renewable energy, solar energy, is converted from sunlight using Photovoltaic (PV) panels. The solar panels are widely installed for civil use. The power supplied by the solar panels is usually DC and not stable at all times. Therefore DC-DC or DC-AC conversion is required before the solar panels supply the load or are connected to the power grid. Energy storage is also needed to absorb the excess power from the source and supply the load during irradiation times. The three-port topologies for the renewable energy have been designed and investigated widely by power engineers and researchers. A great number of topologies have been developed for cascaded converters as well as converters working in parallel. These converters are built for different circumstances, such as on grid or off-grid applications.

The conventional designs normally regulate the converters separately and require a certain number of components, such as at least one switch in each converter. Some studies attempt to combine the components of different converters to improve the circuitry as well as their size and performance. In particular, the switch can be shared by the converters with the single switching technique. Based on this technique, a design of single switch cascaded converters is developed for an off-grid PV power system. Since the switch has to control two different converters, the Pulse Frequency circuit along with the pulse width modulation (PWM) as the traditional design.

The proposed PFM module is developed with a resettable integrator which generates ramp signal with variable frequency. Then the switch control for two converters is achieved simultaneously. The advantages of the proposed circuit include reducing the number of the components as well as the power loss in the power conversion.

This paper consists of the following parts: section 2 introduces the main circuit of the proposed two-stage conversion circuit along with its regulation schemes, its operation modes and the battery modes. Section 3 describes the design process of this study as well as the circuit specifications. The comparison between the proposed design with the conventional is discussed regarding the maximum ratings in this section.

For the off-grid solar application, a two-stage conversion is applied to deliver power from the input to the load as well as the energy storage unit. A boost converter is series connected to a buck converter in the conventional design Fig.1(a). It supplies the load when there is insufficient or even no input power. The inductors L_1andL_2maintain the continuous inductor currents while the capacitors $C_1$and C_2stabilized the battery voltage and the output voltage respectively. In other words, the two duty ratios $D_1$and D_2 are related to the voltages of their own stages only and different from each other. The same switching frequency f is applied to both switches unless there is another requirement.

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HYBRID INTEGRATED SOLAR AND WIND POWER GENERATION SYSTEM FOR REMOTE AREAS

[1]S.Chandraleka, [2]S.Rathinavel.,M.E.

[1]M.E (PED), [2]Assistant Professor
Paavai Engineering College,
Nammakkal, Tamilnadu-6370018, India.

***Abstract*: Now a day's electricity is most essential facility for the human being. One of the primary needs for socio-economic improvement in any nation in the world is the provision of reliable electricity supply systems. This work is a improvement of an indigenous technology hybrid Solar Wind Power system that harnesses the renewable energies in Sun and Wind to generate electricity. Here, electric DC energies produced from photovoltaic and wind turbine systems are transported to a DC disconnect energy Mix controller. The controller is bidirectional connected to a DC-AC float charging-inverter system that provides charging current to a heavy duty storage bank of Battery and at the same time produces inverted AC power to AC loads. All the conventional energy resources are depleting day by day. So we have to shift from conventional to non-conventional energy resources. In this the combination of two energy resources is takes place i.e. wind and solar energy. This process reviles the sustainable energy resources without damaging the nature. Solar panels are used for converting solar energy and wind turbines are used for converting wind energy into electricity. This electrical power can utilize for various purpose. Generation of electricity will be takes place at affordable cost. This paper deals with the generation of electricity by using two sources combine which leads to generate electricity with affordable cost without damaging the nature balance and essential for information communication technology infrastructure and people in rural communities.**

***Keywords*: Electricity, Hybrid, solar, power, wind, Socio Economic development, Hybrid system, Solar and Wind Power, remote areas**

I INTRODUCTION

One of the primary needs for socio-economic improvement in any nation in the world is the condition of reliable electricity supply systems. Electricity is most needed for our day to day life. There are two ways of electricity generation either by conventional energy resources or by non-conventional energy resources. Electrical energy demand increases in word so to fulfill demand we have to generate electrical energy. Now a day's electrical energy is generated by the conventional energy resources like coal, diesel, and nuclear etc. The main drawback of these sources is that it produces waste like ash in coal power plant, nuclear waste in nuclear power plant and taking care of this wastage is very costly. And it also damages he nature. The nuclear waste is very harmful to human being also. The conventional energy resources are depleting day by day. Soon it will be completely vanishes from the earth so we have to find another way to generate electricity.

The new source should be reliable, effluence free and economical. The non-conventional energy resources should be good alternative energy resources for the conventional energy resources. There are many non-conventional energy resources like geothermal, tidal, wind solar etc. While geothermal energy needs very lager step to extract heat from earth. Solar and wind are easily available in all condition. The non-conventional energy resources like solar, wind can be good alternative source. Solar energy has drawback that it could not produce electrical energy in rainy and cloudy season so we need to overcome this drawback we can use two energy resources so that any one of source fails other source will keep generating the electricity. And in good weather condition we can use both sources combine.

II IMPORTANCE OF HYBRID ENERGY SYSTEM

The global search and the rise in the cost of conventional remnant fuel is making supply-demand of electricity product almost impossible particularly in some remote areas. Generators which are often used as an alternative to conventional power supply systems are known to be run only during certain hours of the day, and the cost of fuelling them is increasingly becoming not easy if they are to be used for commercial purposes. There is a growing awareness that renewable energy such as photovoltaic system and Wind power have an important role to play in order to save the situation. Hybrid energy system is the combination of two energy sources for giving power to the load. In other word it can defined as "Energy system which is made-up or designed to extract power by using two energy sources is called as the hybrid energy system." Hybrid energy system has good reliability, efficiency, less emission, and lower cost. In this proposed system solar and wind power is used for generating power. Solar and wind has good advantages than other than any other non-conventional energy sources. Both the energy sources have greater ease of use in all areas. It needs lower cost. There is no need to find special location to install this system.

OVERVIEW OF SOLAR INVERTER USED IN SOLAR MODULES

[1] N.Prasidha Devi, [2] Dr B.Murali Babu.,PhD.,
[1] M.E(PED) Student , [2] Professor
[1] Paavai Engineering College, Namakkal, Tamil Nadu-6370 018, India.
[2] Paavai Engineering College, Namakkal, Tamil Nadu-6370 018, India.

Abstract : This article will provide an overview of the different types of inverters used in solar power systems, including the advantages and disadvantages of each inverters with its suitable applications.

IndexTerms **- Solar Inverter,Application.**

I. OVERVIEW

A solar inverter or PV inverter, is a type of electrical converter which converts the variable direct current (DC) output of a photovoltaic (PV) solar panel into a utility frequency alternating current (AC) that can be fed into a commercial electrical grid or used by a local, off-grid electrical network. It is a critical balance of system (BOS)–component in a photovoltaic system, allowing the use of ordinary AC-powered equipment. Solar power inverters have special functions adapted for use with photovoltaic arrays, including maximum power point tracking and anti-islanding protection.

Solar inverters use maximum power point tracking (MPPT) to get the maximum possible power from the PV array. Solar cells have a complex relationship between solar irradiation, temperature and total resistance that produces a non-linear output efficiency known as the I-V curve. It is the purpose of the MPPT system to sample the output of the cells and determine a resistance (load) to obtain maximum power for any given environmental conditions.

The fill factor, more commonly known by its abbreviation FF, is a parameter which, in conjunction with the open circuit voltage (Voc) and short circuit current (Isc) of the panel, determines the maximum power from a solar cell. Fill factor is defined as the ratio of the maximum power from the solar cell to the product of Voc and Isc.

There are three main types of MPPT algorithms: perturb-and-observe, incremental conductance and constant voltage. The first two methods are often referred to as hill climbing methods; they rely on the curve of power plotted against voltage rising to the left of the maximum power point, and falling on the right.

The inverter is a fundamental component of any solar photovoltaic system, since it is the device that converts the normal DC output of solar modules to an AC supply which can be used by electrical devices such as lamps, home appliances, office equipment, motors, etc. While the function of all inverters is basically the same. In solar power systems they can be classified into three main types, according to the way in which they integrate with the photovoltaic array:

- String inverters(standard inverter)
- Micro-inverters
- Power optimizer systems

II. STRING INVERTERS

The name of string inverters comes from the fact that photovoltaic modules are connected in a series circuit, or string, before connection to the inverter. All PV modules in a series circuit carry the same current, and their voltages add up directly.

Some inverters allow the connection of multiple strings in parallel, instead of using a single circuit for the entire PV array. This setup is beneficial when the array is divided into sections with different orientations and production profiles: PV modules connected in series achieve optimal performance when all modules in a circuit have approximately the same output and operating conditions.

Single-phase inverter with MPP tracker for typical outputs ranging from 0.5 kW to 5 kW for a string of solar panels connected in series. These are widely used in rooftop photovoltaic systems on private dwellings..

Fig 1. Single phase PV string inverter

Original Research Paper

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Engineering

RELAY CO-ORDINATION AND ARC FLASH ANALYSIS USING ETAP

A. Udhayakumar — Assistant Professor, Dept. of EEE, Paavai Engineering College, Namakkal, Tamil Nadu, India

M. N. Gokulraj* — Dept. of EEE, Paavai Engineering College, Namakkal, Tamil Nadu, India
*Corresponding Author

P. Gopinath — Dept. of EEE, Paavai Engineering College, Namakkal, Tamil Nadu, India

ABSTRACT Relays and circuit breakers are heart of the modern large interconnected power system. Proper co-ordination of relays is essential to minimize unnecessary outages. The arc flash hazard is related to electrical safety in work place. The calculations required for determining arc-flash incident energy exposure for electrical workers are involved. The authors have completed arc-flash energy studies for many industrial sites, from small facilities to large chemical plants. This paper provides a summary of the results of these studies, with an emphasis on the wide range of results that were found. Learning's about electrical equipment design, installation and operation are discussed that were found to be associated with high arc-flash energy values. In addition, some methods are described to evaluate the arc-flash energy values for a facility that can help the owner determine the most effective arc flash hazard management policy.

KEYWORDS : Relay co-ordination,arc flash analysis ,ETAP software,arc flash boundary,PPE(personal protective equipments)

1. INTRODUCTION

This approach will need the computer simulation work using two power system studies, namely, an over current protective device(OCPD) coordination study and an arc flash hazard analysis. A few iterations might be needed between the two studies in order to obtain optimal results. Techniques have been presented that enhance protection reliability and preserve selective coordination throughout the system.

In most cases, the selection of a primary OCPD will have significant impact on the AF energy and the viability of efficiently reducing this energy to acceptable levels. Worst level incident energy of various voltage level switchgear are presented .An approach to reducing the arc flash hazard for existing industrial and commercial facilities is proposed. Although every facility has its own issues or concerns, this practical approach shall be able to significantly improve the arc flash safety in existing facilities. The incident energy analysis method for arc flash PPE selection recommended by NFPA.Quantified results on the arc flash hazard reductions, computer simulation using ETAP is conducted for a large oil field facility and a manufacturing facility in industrial building as case studies, and the simulation results for the case studies are presented.

2. SYSTEM MODEL

The GDC Putrajaya Plant 1 has a maximum connected demand of 22.60 MW. GDC draws power from two TNB PMU's namely PMU Abu Bakar Baginda and PMU NUNI through underground cables of 4kM and 9kM length respectively, which are terminated to the 33kV bus bar 1L and 33kV Bus bar 1R capacity for relay coordination, which is as shown in fig1.

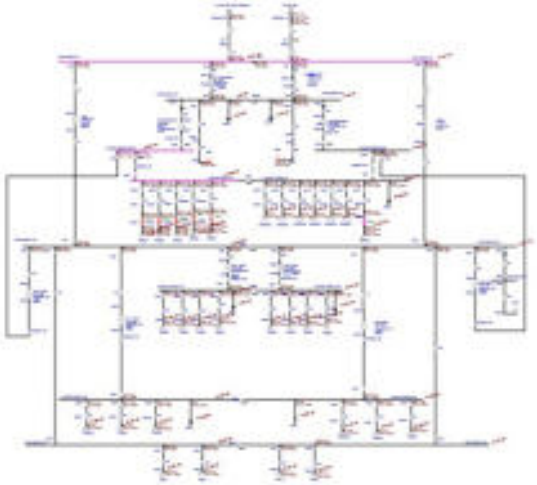

Fig 1 single line diagram of GDC Putrajaya Plant 1

3. RELAY COORDINATION

Relay coordination is essential to obtain continuous operation of system, to provide best service to the consumer and earn the most revenue.

- Quickly isolated the faulty area
- To minimize the magnitude of fault current
- To minimize the operation fault

3.1 primary and back up protection

- Primary protection :Device closest to the fault
- Back up protection :Device next in the line
- Security: if the primary protection fails to maintain the integrity of the system, back up protection should operate.
- Reason for providing back up protection: Failure of primary protection.

3.2 Stage 51(Phase and Neutral)

- 51 is the overcurrent Relay. This relay has a phase and neutral protection they are 51p&50n.

$$pickup(51p) = \frac{1.1 * FLA}{CTratio}$$

FLA= Full load current
Curve type: IEC Extremely inverse.

$$pickup(51n) = \frac{0.2 * FLA}{CTratio}$$

Curve type: IEC standard inverse.

3.3 stage 50(phase and Neutral)

- 50 is the instantaneous overcurrent protection relay this relay have a phase and neutral protection 50p & 50n.

$$pickup(50p) = \frac{1.3 * LRA}{CTratio}$$

LRA=locked rotor current
Curve type: DMT (instantaneous)

$$pickup(50n) = \frac{FLA}{CTratio}$$

FLA= full load amps
Curve type: DMT (instantaneous)

3.4 Relay coordination for two bus system

Study is repeated with the change in various relay characteristic curves like definite time, normal inverse, Very inverse and extreme inverse characteristics. Settings with minimum arc Flash level are selected as optimal fit for the system. Following studies are carried out,

- Load Flow Analysis

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Development of ethanol and acetone gas sensing performance of $MgCo_2O_4$ nanosensors by clad modified fiber optical method

S. Rathinavel[a], S. Vadivel[b,*], G. Balaji[a]

[a] Department of Electrical and Electronics Engineering, Paavai Engineering College (Autonomous), Namakkal 637 018, Tamilnadu, India
[b] Department of Physics, Paavai Engineering College (Autonomous), Namakkal 637 018, Tamilnadu, India

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ABSTRACT

We have successfully synthesized large scale magnesium cobalt oxide ($MgCo_2O_4$) nanosheets (NSs) was synthesized by a facile hydrothermal route. These $MgCo_2O_4$ NSs were characterized by X-ray diffractometry, N_2 adsorption Brunauer-Emmett-Teller method, scanning electron microscopy and transmission electron microscopy analysis. XRD and TEM results suggest that $MgCo_2O_4$ was cubic structure with nanosheets and sizes in the range of 200–250 nm diameter and 10–15 nm thickness. The N_2 adsorption–desorption analysis indicates that the BET surface area of $MgCo_2O_4$ nanoparticles is calculated to be 98.5 m^2/g and the pore size distribution is mostly centered at 30 nm. The $MgCo_2O_4$ sensor was exposed two type of reducing gases like ethanol and acetone and the results demonstrates that the sensor showed superior gas sensing performance such as high sensitivity (81×10^{-3} k/Pa), rapid response (15 s) and recovery time (19 s) towards ethanol gas. This could be due to large specific surface area with sufficient sensing active sites, more gas adsorption, and achieving the enhanced gas-sensing performance. The improved gas sensing mechanism of the proposed sensor is also discussed in detail.

1. Introduction

In afterward a long time, since of growing anxiety with respect to environmental security and safety, demands for area and monitoring of harmful and dangerous gasses have become the issue of concern inside the entire world. Ethanol, also called ethyl alcohol, pure alcohol, grain alcohol, or drinking alcohol, is a volatile, flammable, colorless liquid. Prolonged heavy consumption of alcohol can cause significant permanent damage to the brain and other organs. Moreover, the acetone was underestimated, mostly because there were not any suitable devices to detect it in exhaled breath and correlate it with specific diseases, such as diabetes. Thus, it is important to develop a high performance gas sensor that could be used in ethanol gas detection. Chemical gas sensors have found wide applications in industrial production, therapeutic diagnosis, natural observing, and air quality control [1,2]. Expanding necessities for accurate detection of hazardous, poisonous, and biomarker gasses have driven to growing intrigued in high-performance gas sensors [3,4]. Nowadays, fiber optic gas sensors based on metal-oxides as the detecting medium have been detailed for moving forward the gas sensing performance at room temperature operation [5]. These sensors are safe to electromagnetic impedances, are low cost and might be utilized in antagonistic situations. The intensity of the light passing through the fiber is remarkably sensitive to change within the refractive index of the cladding, which is influenced by the gas to be identified. This shapes the discovery guideline of the fiber optic gas sensor and is accomplished by evacuating a little portion of the cladding of the fiber and supplanting it with the metal oxide. Compared with the commercial sensors, metal-oxide semiconductor gas sensors have pulled in much consideration due to their advantageous highlights, such as huge sensitivity beneath surrounding conditions, low control utilization, and simplicity in manufacture. Semiconducting metal oxides such as ZnO, SnO_2 and Fe_2O_3 etc., have been widely studied as gas sensing materials [6–10]. Among these, Spinel type oxides with an equation of AB_2O_4 (A could be a divalent metal and B may be a trivalent one) have been detailed as a imperative complex oxide in field of gas sensors and have been examined for the location of oxidizing as well as reducing gasses [11].

Moreover, most of the literatures focus on $MgCo_2O_4$ as used to electrochemical investigations and its applications in batteries and supercapacitors [12–14]. To date, no report about $MgCo_2O_4$ based gas sensor literatures. Hence, we reported gas sensing investigations $MgCo_2O_4$ sensor using fiber optic clad modified method. Moreover, we developed significant morphology like nanosheets, which provide more active site on its surface, which is benefit the more absorption of gas molecules on the surface, enhancing the gas sensing performance. To the best of the author's knowledge, this is the first report about fiber

* Corresponding author.
E-mail address: vadivel.physics@gmail.com (S. Vadivel).

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High performance ethanol and acetone gas sensor based nanocrystalline $MnCo_2O_4$ using clad-modified fiber optic gas sensor

S. Vadivel[a,*], G. Balaji[b], S. Rathinavel[b]

[a] Department of Physics, Paavai Engineering College (Autonomous), Namakkal, 637 018, Tamilnadu, India
[b] Department of Electrical and Electronics Engineering, Paavai Engineering College (Autonomous), Namakkal, 637 018, Tamilnadu, India

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Keywords:
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Fiber optic gas sensor
Ammonia gas
High sensitivity

ABSTRACT

Herein, we report a facile, low-cost and one-step hydrothermal approach for the synthesis of $MnCo_2O_4$ (MCO) nanoparticles without any post annealing treatment. The crystalline phase, the morphology, and the valences of the elements in the obtained samples were characterized by powder X-ray diffraction (PXRD), transmission electron microscopy (TEM), X-ray photoelectron spectrometry (XPS) and Energy dispersive spectra (EDS) analysis, respectively. XRD and TEM results suggest that as synthesized $MnCo_2O_4$ have spinel cubic structure with spherical shaped morphology. The Nitrogen adsorption–desorption analysis indicates that the BET surface area is calculated to be 65.3 m^2/g and the pore size distribution is mostly centered at 28 nm, which is in good agreement with the grain size calculated from XRD results. Gas sensing properties of nanocrystalline $MnCo_2O_4$ clad – modified fiber optic sensor is reported for ethanol and acetone gasses, at room temperature. The results showed that $MnCo_2O_4$ has high sensitivity to ethanol gas, fast response and recovery time than compared to acetone gas. The possible gas sensing mechanism is also proposed in detail.

1. Introduction

Recently, all around the globe on detecting and monitoring toxic and dangerous gases is mostly concentrated [1–5], because of the increasing release of hazardous gases, fluids and chemicals from industrial effluents, agricultural chemicals and fertilizers [6]. Gas sensors are in great demand for various household and industrial applications [7,8]. Thus, gas sensors with fast response, high sensitivity and selectivity are promising for exploration [9]. Resistive type metal-oxides sensors are mostly utilized for gas detecting applications yet their gas sensitivity is poor moderately at room temperature and group of research is going ahead to enhance the gas sensitivity, selectivity and stability [10–13]. Recently, fiber optic gas sensors using metal oxides are increasingly explored as they offer several advantages such as low cost, small size and high sensitivity [14]. Clad modified fiber optic based gas sensors using metal oxides as gas sensing medium is a well known room temperature based low cost efficient sensing technique. In this type of sensors cladding portion of the fiber is replaced by the prepared metal oxide and used for gas sensing. Gas interaction with modified clad by varying the intensity of the light propagating through the fiber core is the key principle in the sensing mechanism. In recent years, variety of porous metal oxides such as Co_3O_4, NiO, ZnO, SnO_2, etc. have been synthesized and analyzed for gas sensing because of its offer low cost, long-term stability, plausible cyclability and environmental-friendly, making them attractive metal oxide semiconductors have received enormous attention for gas sensing applications.

Among them, the transition metal oxides with a spinel structure have been paying attention in the broad area of research field owing to their unique properties such as magnetic, electrical and optical properties [15–17]. The common chemical formula of the spinel is AB_2O_4, where A and B are the divalent and trivalent metal ions, coordinated in tetrahedral and octahedral sites, respectively [18]. M. Manjula et al. [19] have prepared Ho-doped Bi_2O_3 nanoparticles and studied the gas sensing properties of ammonia, ethanol, methanol and acetone gases clad-modified fibre optic gas sensor. M. Subramanian et al. [20] have synthesized nanosized $Zn_3(VO_4)_2$ was synthesized by solution combustion method and studied the ammonia gas sensor using clad modified fiber optic method. M. Manjula et al. [21] have reported gas sensing properties of nanocrystalline bismuth oxide clad – modified fiber optic sensor is reported for ammonia, ethanol, methanol and acetone gasses at room temperature. Thus, $MnCo_2O_4$ has been acknowledged as an elective cathode material for the dangerous and vapor gas sensor because of its amazing conductivity and tunable structural properties. $MnCo_2O_4$ lies on the typical spinel family that comprises of Mn^{2+} particles in tetrahedral sites, Co^{3+} particles in the octahedral sites and O_2^- particles tend to facilitate the two positions to

* Corresponding author.
E-mail address: vadivel.physics@gmail.com (S. Vadivel).

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Development of ethanol and acetone gas sensing performance of $MgCo_2O_4$ nanosensors by clad modified fiber optical method

S. Rathinavel[a], S. Vadivel[b,*], G. Balaji[a]

[a] Department of Electrical and Electronics Engineering, Paavai Engineering College (Autonomous), Namakkal 637 018, Tamilnadu, India
[b] Department of Physics, Paavai Engineering College (Autonomous), Namakkal 637 018, Tamilnadu, India

ARTICLE INFO

Keywords:
$MgCo_2O_4$
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Fiber optic
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High sensitivity

ABSTRACT

We have successfully synthesized large scale magnesium cobalt oxide ($MgCo_2O_4$) nanosheets (NSs) was synthesized by a facile hydrothermal route. These $MgCo_2O_4$ NSs were characterized by X-ray diffractometry, N_2 adsorption Brunauer-Emmett-Teller method, scanning electron microscopy and transmission electron microscopy analysis. XRD and TEM results suggest that $MgCo_2O_4$ was cubic structure with nanosheets and sizes in the range of 200–250 nm diameter and 10–15 nm thickness. The N_2 adsorption–desorption analysis indicates that the BET surface area of $MgCo_2O_4$ nanoparticles is calculated to be 98.5 m^2/g and the pore size distribution is mostly centered at 30 nm. The $MgCo_2O_4$ sensor was exposed two type of reducing gases like ethanol and acetone and the results demonstrates that the sensor showed superior gas sensing performance such as high sensitivity (81×10^{-3} k/Pa), rapid response (15 s) and recovery time (19 s) towards ethanol gas. This could be due to large specific surface area with sufficient sensing active sites, more gas adsorption, and achieving the enhanced gas-sensing performance. The improved gas sensing mechanism of the proposed sensor is also discussed in detail.

1. Introduction

In afterward a long time, since of growing anxiety with respect to environmental security and safety, demands for area and monitoring of harmful and dangerous gasses have become the issue of concern inside the entire world. Ethanol, also called ethyl alcohol, pure alcohol, grain alcohol, or drinking alcohol, is a volatile, flammable, colorless liquid. Prolonged heavy consumption of alcohol can cause significant permanent damage to the brain and other organs. Moreover, the acetone was underestimated, mostly because there were not any suitable devices to detect it in exhaled breath and correlate it with specific diseases, such as diabetes. Thus, it is important to develop a high performance gas sensor that could be used in ethanol gas detection. Chemical gas sensors have found wide applications in industrial production, therapeutic diagnosis, natural observing, and air quality control [1,2]. Expanding necessities for accurate detection of hazardous, poisonous, and biomarker gasses have driven to growing intrigued in high-performance gas sensors [3,4]. Nowadays, fiber optic gas sensors based on metal-oxides as the detecting medium have been detailed for moving forward the gas sensing performance at room temperature operation [5]. These sensors are safe to electromagnetic impedances, are low cost and might be utilized in antagonistic situations. The intensity of the light passing through the fiber is remarkably sensitive to change within the refractive index of the cladding, which is influenced by the gas to be identified. This shapes the discovery guideline of the fiber optic gas sensor and is accomplished by evacuating a little portion of the cladding of the fiber and supplanting it with the metal oxide. Compared with the commercial sensors, metal-oxide semiconductor gas sensors have pulled in much consideration due to their advantageous highlights, such as huge sensitivity beneath surrounding conditions, low control utilization, and simplicity in manufacture. Semiconducting metal oxides such as ZnO, SnO_2 and Fe_2O_3 etc., have been widely studied as gas sensing materials [6–10]. Among these, Spinel type oxides with an equation of AB_2O_4 (A could be a divalent metal and B may be a trivalent one) have been detailed as a imperative complex oxide in field of gas sensors and have been examined for the location of oxidizing as well as reducing gasses [11].

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* Corresponding author.
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Cost Effective Conversion of Existing Bike into Hybrid Electric Bike

Dr.G.Balaji[1], Mrs.K. K. Poongodi[2], V. Ramya[3], N. Yogeshwari[4]

[1]Head of the Department, [2]Professor, [3, 4]UG Final year students, Paavai Engineering College(Autonomous)[#1, 2, 3, 4]

Abstract: ***Air pollution from motor vehicles and exhaustion of natural resources has become a serious global and environmental hazard. The emission of poisonous gases such as Carbon monoxide (CO), Nitrous Oxide (N_2O), Sulphur dioxide (SO_2) and other hazards gases from Two-Wheelers is a significant contributor to air quality problems which cause severe threats to all living organisms. Due to increase in number of vehicles and limited use of emission control strategies, two-wheelers are considered to be a significant source of urban air pollution in most of the Indian cities. To overcome such harmful effects, the modification of Existing bike into a Hybrid Electric bike is necessary. This Hybrid method involves two modes of operation where the battery is operated as the main source and the fuel is operated as back up supply. Through switching operation, the modes of process can be switched from battery into fuel and vice versa. BLDC hub motor is used for its long operating life, compact size, high efficiency and better Speed-Torque characteristics. The Sealed Lead Acid battery is used and the Controller is used to governor the speed of the vehicle. Through this conversion long distance is facilitated. The conversion of Existing bike into Hybrid bike is cost effective. The pollution due to air and fuel consumption is highly reduced which in turn reduces the maintenance cost of the vehicle.***

Keywords: Controller, Charging, Switching operation

I. INTRODUCTION

Our current industrial society works only with the conventional energy sources like coal, oil, natural gases or uranium. Meanwhile, there are some problem associate with them. They produce several kinds of pollution. If there is no care for atmospheric pollution, climate change and nuclear waste can endanger our living condition on the earth. After several years, the limited energy source will be exhausted and will not guarantee energy supply in the future. On the opposite side, the renewable energy sources uses the natural flows. Two-wheelers are considered to be a major transport medium for most of the people. Two-wheelers powered by 2-stroke engines are a major source of pollution in large cities. The high levels of pollutants emitted by these vehicles are mainly responsible for respiratory ailments including lung cancer, asthma, etc. Therefore, the high fuel consumption and greenhouse gas emission are contributed by two-wheelers in urban areas are need to be more urgent attention to improve the near-term sustainability of energy and urban air quality in the future. The energy security is one of the important concerns of all countries. In India, the most commonly used energy source is based on fossil fuels. These problem can be overcome by using the renewable energy source as a fuel. To achieve this condition, battery can be used where it can be recharged whenever drains out. Thus electric bike can be used instead of petrol engine bike. Even though it is used, there are certain disadvantage associated with this method. Some of the disadvantage include, it is quite difficult to climb the hill using electric bike. The initial cost of buying a new electric bike is very high. The continuous charging and discharging of battery will reduce the life of battery. This in turn increase the maintenance cost of electric bike. The above disadvantages can be overcome by converting the existing petrol engine bike into a hybrid electric bike. By making some modification in the existing petrol engine bike, it can be used as a hybrid one.

II. METHODOLOGY

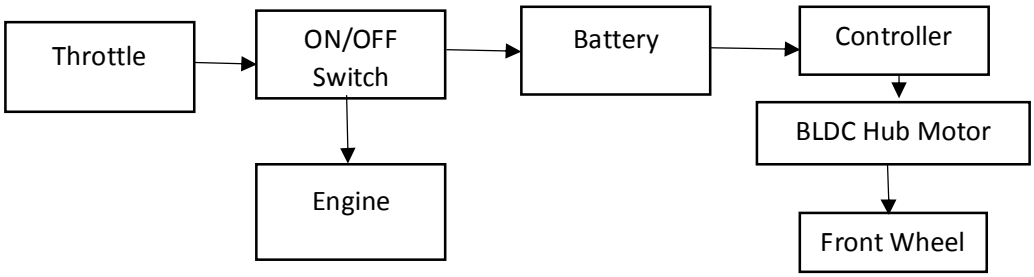

FIGURE.1 Block Diagram of Hybrid Electric Bike

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SOFT-SWITCHED OF HIGH STEP-UP DC-AC INVERTER FOR A BUCKBOOST VOLTAGE SOURCE INVERTER WITH AN SPLIT CAPACITOR

S. Ramachandran[1], M. Ramasamy[2], G. Srinivasan[3], S. Sujithvignesh[4]
[1]Assistant Professor, Department of Electrical and Electronics Engg. Paavai Engg. College, Namakkal, India
[2]Associate Professor, Department of Electrical and Electronics Engg. K S R College of Engg., Namakkal, India
[3]UG Student, Department of Electrical and Electronics Engg., Paavai Engg. College, Namakkal, India
[4]UG Student, Department of Electrical and Electronics Engg., Paavai Engg.College, Namakkal, India

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ABSTRACT:*Renewable power systems as distributed generation (DG) units often experience big changes in the inverter input voltage due to fluctuations of energy resources. Often, a front-end boost converter is added to step up the DC voltage when the energy resources are at a weak point. However, when a very high boost gain is demanded, the duty cycle may come to its extreme, and large duty cycle causes serious reverse-recovery problem. This paper proposes a novel single-stage boost-type inverter especially for wind power generation. By introducing a passive network including coupled inductors to the classic three phase bridge inverter, and adjusting the shoot-through duty, the converter can output a stable AC voltage even when it is at a weak wind level. The single stage operation of the converter can lead to improved reliability and higher efficiency. Theoretical analysis, simulation and experimental results are presented to verify its good performance.*

Key Words:*Single-stage boosts inverter; Wind power generation; Coupled inductors; Shoot-through state.*

1. INTRODUCTION

The increasing tension of the globe energy supply has given a high impetus to the use of renewable energy re-sources. This presents a significant opportunity for distributed power generation (DG) systems using renewable energy resources, including wind turbines, photovoltaic (PV) generators, small hydro systems and fuel cells. These DG units produce a wide range of voltages due to the fluctuations of energy resources and impose stringent requirements for the inverter topologies and controls. Usually, a boost type DC-DC converter is added after the DG units to step up the DC voltage. However, the classic boost converter may not be able to provide enough DC voltage gain when the input is very low, even for an extreme duty cycle. Large duty cycle operation may also result in serious reverse-recovery problem and increase the rating of switching devices. Furthermore, the added converter may deteriorate the system's efficiency, increase system size, weight and cost. So it's desirable to have a single-stage high-gain inverter if it's efficiency effective. Single-stage topologies, which integrate performance of each stage in a multistage power converter, are becoming a research focus. Though they may result in increasing control complexity, they have the attractive potentials of higher efficiency, reliability, and lower cost.

2. EXSISITING SYSTEM

A control strategy for power flow management of a grid-connected hybrid PV-wind-battery based system with an efficient multi-input transformer coupled bidirectional dc-dc converter is presented. The proposed system aims to satisfy the load demand, manage the power flow from different sources, inject surplus power into the grid and charge the battery from grid as and when required. A transformer coupled boost half-bridge converter is used to harness power from wind, while bidirectional buck-boost converter is used to harness power from PV along with battery charging/discharging control. The proposed converter architecture has reduced number of power conversion stages with less component count, and reduced losses compared to existing grid-connected hybrid systems. This improves the efficiency and reliability of the system.

Diode-assisted buck-boost voltage-source inverter achieves high voltage gain by introducing a switch-capacitor based high step-up dc-dc circuit between the dc source and inverter bridge. As for the unique structure, various pulse width modulation (PWM) strategies are developed with regard to the chopped

A NOVEL DESIGN OF SEPIC OPERATION OF AN DC-DC CURRENT SOURCE CONVERTER USING WECS

S. Ramachandran[1] & M. Ramasamy[2] & P. Sridevi[3] & S. Thamarai Selvi[4]
[1]Assistant Professor, Department of Electrical and Electronics Engg., Paavai Engg. College, Namakkal, India
[2]Associate Professor, Department of Electrical and Electronics Engg., K.S.R College of Engg., Namakkal, India
[3]UG Student, Department of Electrical and Electronics Engg., Paavai Engg. College, Namakkal, India
[4]UG Student, Department of Electrical and Electronics Engg. Paavai Engg. College, Namakkal, India

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ABSTRACT: *A high step-up resonant dc-dc converter with ripple-loose input modern-day for renewable strength structure. We use an enter-current doubler and a switching mechanism hired at an output-voltage doubler to gain high step-up voltage benefit without having to use a transformer with excessive turn ratio. A lively-clamp circuit established at the primary facet suppresses the surge voltage at the switch additives and recycles the power stored in the leakage inductance. A resonance that happens on the secondary side of the converter is used to reduce the turn-off contemporary and switching loss notably, and to acquire excessive power conversion efficiency. The enter current ripple declines to zero theoretically due to the fact the duty cycle of the primary-aspect switches is always set to zero.5 no matter the input voltages and load versions. The circuit operations, constant-country analysis, and layout guideline of the proposed converter are also presented. A six hundred-W prototype converter has been fabricated to demonstrate the overall performance of the proposed converter.*

Key Words: : *Current source converter, efficiency, wind mill, dc to dc converter, battery, SEPIC converter, wind electricity conversion gadget.*

I. Introduction

Renewable are now the arena's quickest-growing strength resources and are expected to increase by using 2.6 % consistent with yr via 2040. via 2040, coal, herbal gasoline, and renewable strength sources are anticipated to provide more or less identical stocks (28%– 29%) of the sector power generation. The renewable strength resources along with photovoltaic panel, thermoelectric generator, and gasoline-mobile stack generate low voltages and require low-contemporary ripple to enlarge their lifestyles span, so that they require distinctly-efficient dc-dc converter which can offer high step-up conversion with low input-current ripple over the whole range of operation.

To gain high step-up conversion, some converters use a transformer with high flip ratio, however this transformer has massive leakage inductance and parasitic capacitance which can reason excessive voltage or modern-day spike at the strength gadgets. further, to reduce input cutting-edge ripple, a converter with non-stop input cutting-edge is preferred due to the fact because the ripple decreases, the conduction loss of the primary-side switches and the size of the enter electrolytic capacitors can be decreased. current-fed kind converters can meet most of those requirements and are consequently widely utilized in renewable power structures. A converter designed with an input-contemporary doubler in conjunction with an lively-clamp circuit and an output-voltage doubler has low conduction loss on the number one aspect due to the fact the input present day doubler divides the input modern-day into inductor currents, and the output-voltage doubler is prepared with a series–resonant circuit that may flip off the output diodes while modern is zero.

A quasi-resonant cutting-edge-fed converter with excessive performance makes use of an active-clamp circuit in the primary aspect to generate quasi-resonant operation, thereby lowering the switching loss and modern strain, and putting off the reverse recovery trouble of the diodes inside the voltage doubler. This converter is commonly used for low strength applications as it is based handiest on two switches at the number one facet. Interleaved cutting-edge-fed twin-active-bridge dc-dc converters have been proposed to in addition reduce the enter-current ripple. But the responsibility cycle of the switches used at the primary aspect varies with the input voltage and output load, and the present day ripple can not be zero for the complete range of operation. additionally, the interleaved shape may additionally improve the general price because it increases the quantity of components and calls for a complex control set of rules.

Use of multi-degree converters has been proposed. In a boost cellular with full bridge dc-dc converter gives ripple-loose enter current, and a voltage doubler at the secondary side increases the voltage

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Wind Energy Using in Generation of proficient Power with Five-Level Dual-Buck Full Bridge Inverters

S. Ramachandran[1], M. Ramasamy[2], S. Saravanan[3]
[1]*Assistant Professor, Department of Electrical and Electronics Engg., Paavai Engg. College, Namakkal, India*
[2]*Associate Professor, Department of Electrical and Electronics Engg., K.S.R College of Engg., Namakkal, India*
[3]*UG Student, Department of Electrical and Electronics Engg., Paavai Engg. College, Namakkal, India*

***Abstract*: Among varied styles of renewable generation, electrical phenomenon generation, alternative energy, and fuel cells are wide used. The power density of dual-buck converters has to be improved, also because the conversion potency. In this work the simulation results of wind energy conversion system with three phase five-level DBFBI topologies are obtained through Power sim for grid application. High-efficiency converters area unit fascinating for renewable energy systems, specifically those connected with grid connected wind applications. The aim is to possess a straightforward, robust, free maintenance, and highly efficient system. The proposed five-level DBFBI topologies have been applied in a three phase wind energy system and presents several promising advantages. First, it will generate power for ac utility from PMSG. Secondly, it will increase or decreases output-voltage level with the assistance of buck-boost device to take care of constant output in order that it's higher potency and lower weight for the general system. Third, in the case of a five-level DBFBI topologies, it does not require an output filter because high-order harmonics are effectively filtered off, owing to the reactance of the inductive load; so, it will turn out a stairway voltage wave shape with lower harmonics eliminated specified higher order harmonics will be simply filtered off if required for that specific application.**

***Keywords*: Wind energy, Dual-buck inverter, efficiency, grid-tied inverter, multilevel inverter, Power density**

1. Introduction

Power MOSFETs have some attractive advantages, such as fast switching, low switching loss, and resistive conduction voltage drop. The switching frequency of the power converters using MOSFETs can be higher than that of the power converters using insulated-gate bipolar transistors (IGBTs), which benefits for reducing current ripples and the size of passive components. However, since the reverse recovery characteristic of the body diodes is poor, power MOSFETs cannot be used in conventional H-bridge inverters. In order to utilize the advantages of MOSFETs, soft-switching techniques are adopted conventionally. However, additional auxiliary switches, passive components, and more gate driving circuits are required in the soft-switching inverter, which lowers the reliability and increases the cost and complexity. In dual-buck inverters, no reverse recovery problem occurs in the freewheeling mode, since the independent freewheeling diode has excellent reverse recovery characteristic. In addition, power MOSFETs are used in dual-buck inverters. Therefore, the dual-buck inverter is an attractive solution to achieve high efficiency for low-power grid-connected applications. Two filter inductors are required in single-phase dual-buck inverters, and both of the inductors are operating at each half cycle of the utility grid alternately, which increases the size and weight of the converter. Hence, the power density of conventional two-level and three-level dual-buck inverters needs to be improved. The multilevel system is an effective way to attain high power density.

However, the number of power switches used in the multilevel inverter is more than that used in the conventional half-bridge and full-bridge inverters. Moreover, its control circuit is much more complicated. Thus, the tradeoff between the performance and the hardware cost should be considered in the design of multilevel inverters A five-level H-bridge inverter topology was proposed by introduce a neutral point clamped bi-directional switch (NPC branch) based on the conventional full-bridge inverter .Compared with the Dual Noval Power Converter five-level inverter topology, the FCC five-level inverter topology, and the ANPC five-level inverter topology, the number of power devices in the new five-level H-bridge inverter has been reduced significantly . The low-voltage (less than 1000 V) application, this five-level H-bridge inverter topology is an enhanced option than conventional multilevel inverter topologies. It is regarded as one of the best solutions for grid-tied inverters as well. In the issue of neutral point (NP) potential balancing was discussed as well, and the NP potential self-balancing of two capacitors was considered to be automatically realized. However, the NP impending self-balancing of five-level full-bridge inverters is associated to the modulation index. It provide momentous advantages over the two-level converter, but not limited to lower harmonic distortion, lower electro-magnetic interference, low stress of the semiconductor switching devices and high effectiveness In a control strategy (PID) for a Buck-Boost converter and five-

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DUAL AXIS SOLAR TRACKING SYSTEM USING ARDUINO

A. Karthika[1], S. Jayanthi[1], G. Deivamani[2]

[1]Undergraduate Students, Dept. of EEE, Paavai Engineering College, Namakkal
[2]Assistant Professor, Dept. of EEE, Paavai Engineering College, Namakkal

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Abstract - *The world is now moving towards the renewable energy source due to various factors like pollution and cost of non-renewable energy sources. One of the major renewable energy sources is Sun. In this paper Arduino based Dual-axis solar tracking system proposed in order to get maximum solar energy. The Arduino is used to give command to rotate the solar panel. Solar trackers are used to improve the power gain from solar energy. Solar power is changes due to the seasonal variation and tilting of earth which changes the position of the sun in the sky. In this regard dual axis solar tracking is practically implemented and performance is compared with fixed mount and single axis solar tracking system. Finally, experimental result clearly evident that proposed method gives better efficiency compared to fixed mount and single axis solar tracking system.*

Key Words: Renewable Energy, Dual axis solar tracker, Arduino, LDR, Solar power.

1. INTRODUCTION

Solar energy is emerged as a possible source of renewable energy over the past two to three decades. This solar energy is converted into electrical energy by using solar panel according to the principle of photovoltaic effect. Out of various renewable energy sources solar energy is widely used. Because it is simple and it is easy to use in household too. Solar Trackers is a device used for the rotation of solar panel according to the sun's rays. To utilize this renewable solar energy solar trackers are employed [1]. For static solar panel, there is no movement in the panel. But the position of the sun changes during rising and setting (sun rises in the east and sets in the west). Due to this reason, single axis solar tracker is developed for rotation of solar panel in east and west direction. But due to the rotation and revolution of earth we cannot get equal amount of sunrays throughout the year. So that we adopted dual axis solar tracker to utilize the solar energy effectively and efficiently by rotating the panel in both horizontal and vertical direction. The main objective of dual axis solar tracker is to increase the efficiency of the solar panel by 30-45% when compared to the static and single axis solar tracker. The literature survey clearly shows the different methods of solar tracking for maximum utilization of solar power [1-15].

The single axis tracker is able to rotate only on horizontal (or) vertical. But this dual axis tracker is able to rotate on both horizontal and vertical movement. This dual axis solar tracker was implemented by using Arduino board [2]. Low cost of implementation by Arduino is the reason behind choosing Arduino in this project [3]. This was achieved even by using microcontroller [4].

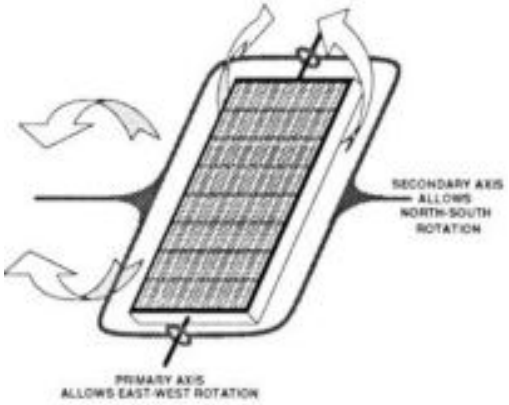

Figure.1 Mechanism of dual axis tracker

The above figure.1 shows the basic operating mechanism of dual axis solar tracker. It is basically an Azimuth-Altitude dual axis solar tracker [5]. Altitude refers to elevation of angle between a substance and the observer's location. It is basically between the angles of 0-90◦. Zenith distance can also be used instead of altitude. Then azimuth is usually analysed from north and increasing towards east [6]. This is mainly employed to get the maximum efficiency when compared to the static and single-axis solar tracking system [7]. To achieve this, we used Arduino UNO, LDRs, DC motor, LCD and solar panel. In [8] automatic solar tracking and two axis solar tracking is proposed in [9] for better solar tracking based on the position of sun.

The main contribution of proposed paper is given below:

•To trace more solar power in different location in different time period in a day to get maximum efficiency.

•To develop the Arduino based Dual axis solar tracker.

•To compare the efficiency of dual axis tracker with single axis tracker.

2. DUAL AXIS SOLAR TRACKER

The block diagram of our dual axis solar tracker system is shown in Figure.2. It consists of an Arduino board, LDR, LCD display, DC motor. An input command is given to the Arduino board. Four LDRs are connected to the light comparison unit [14]. This unit gives signal to the Arduino. The Arduino in turn command the motor driving circuit to rotate the solar panel in horizontal or vertical position.

Performance optimisation of electrochemical micromachining of micro-holes on Inconel 625 alloy

V. Subburam*

Department of Mechanical Engineering,
Paavai Engineering College,
Namakkal, 637018, India
Email: v_subburam@yahoo.com
*Corresponding author

S. Ramesh

Department of Mechanical Engineering,
KCG College of Technology,
Chennai, 600097, India
Email: ramesh_1968in@yahoo.com

P.N. Mohan Kumar

Department of Mechanical Engineering,
Paavai Engineering College,
Namakkal, 637018, India
Email: mohankm99@yahoo.com

A. Srinivasan

Department of Mechanical Engineering,
AVS Engineering College,
Salem, 636003, India
Email: srivankumar14@gmail.com

Abstract: This work involves producing micro holes on Inconel 625 alloy through Electrochemical micromachining (EMM) process. The input parameters investigated are supply voltage, electrolyte concentration and duty ratio. The cathode tool used is a conical tipped stainless steel needle and the electrolyte is acidified sodium nitrate solution. Taguchi design of L9 Orthogonal Array is followed for experimental work. The performance analysis is done through process responses such as machining rate and overcut. The experimental results have given the optimum parameter combination for higher machining rate as 16 V supply voltage, 35 g/lit electrolyte concentration and 45% duty ratio and for lesser overcut as 12V, 35 g/lit and 45% duty ratio. The influence of input parameters on the process is also studied. The multi-objective optimisation technique used has produced 12 V, 30 g/lit and 45% duty ratio as the ideal combination for achieving higher machining rate and lower overcut.

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Study on mechanical properties of graphite particulates reinforced aluminium matrix composite fabricated by stir casting technique

V. Mohanavel[a*], K. Rajan[b], S. Suresh Kumar[c], G. Vijayan[d], M. S. Vijayanand[e]

[a]*Department of Mechanical Engineering, St. Peter's University, Chennai, India.*
[b]*Department of Mechanical Engineering, Dr.MGR Educational & Research Institute University, Chennai, India.*
[c]*Department of Mechanical Engineering, Panimalar Polytechnic College, Chennai, India.*
[d]*Department of Mechanical Engineering, Ganadipathy Tulsi's Jain Engineering College, Vellore, India.*
[e]*Department of Mechanical Engineering, Paavai Engineering College, Namakkal, India.*

Abstract

The lineage of applied materials science is always in demand for light weight and highly performing materials. Such materials would find their applications in aircraft, structural, non-structural and automobile industries, etc. The present research study focuses on the production of aluminium (AA6351) matrix composites reinforced in different mass fractions of graphite particulates by using stir casting method. The mass fraction of reinforcement was varied from 0% to 12% in stages of 4%. Hardness and tensile strength of the composite were investigated. The microstructures of the produced composites were examined by scanning electron micrographic test. The SEM images revealed the non-homogeneous distribution of graphite (Gr) particles in the matrix and this may be due to low density of graphite. The test results revealed that the mechanical properties of the composite decrease with increase in the mass fraction of graphite particle content, this may be due to poor interfacial bonding between the reinforcement and the matrix. The brittle nature of the reinforcing particles (graphite) plays a vital role in decreasing the mechanical properties because the graphite as a soft reinforcement is brittle in nature and so it enhanced the brittleness in the AMCs.

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Keywords:AA6351 alloy, Graphite, Hardness, Scanning Electron Microscope (SEM), UTS.

1. Introduction

Titanium, aluminium, nickel and magnesium alloys are the popular matrix metals presently in vogue, which are particularly suitable for automotive, defence and aerospace applications [1].

*Corresponding author. Tel : +91 9043392344
E-mail address : mohanavel.phd@gmail.com

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Study of the microstructures and mechanical properties of aluminium hybrid composites with SiC and Al2O3

Article *in* Materiali in Tehnologije · February 2019

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Performance optimisation of electrochemical micromachining of micro-holes on Inconel 625 alloy

V. Subburam*

Department of Mechanical Engineering,
Paavai Engineering College,
Namakkal, 637018, India
Email: v_subburam@yahoo.com
*Corresponding author

S. Ramesh

Department of Mechanical Engineering,
KCG College of Technology,
Chennai, 600097, India
Email: ramesh_1968in@yahoo.com

P.N. Mohan Kumar

Department of Mechanical Engineering,
Paavai Engineering College,
Namakkal, 637018, India
Email: mohankm99@yahoo.com

A. Srinivasan

Department of Mechanical Engineering,
AVS Engineering College,
Salem, 636003, India
Email: srivankumar14@gmail.com

Abstract: This work involves producing micro holes on Inconel 625 alloy through Electrochemical micromachining (EMM) process. The input parameters investigated are supply voltage, electrolyte concentration and duty ratio. The cathode tool used is a conical tipped stainless steel needle and the electrolyte is acidified sodium nitrate solution. Taguchi design of L9 Orthogonal Array is followed for experimental work. The performance analysis is done through process responses such as machining rate and overcut. The experimental results have given the optimum parameter combination for higher machining rate as 16 V supply voltage, 35 g/lit electrolyte concentration and 45% duty ratio and for lesser overcut as 12V, 35 g/lit and 45% duty ratio. The influence of input parameters on the process is also studied. The multi-objective optimisation technique used has produced 12 V, 30 g/lit and 45% duty ratio as the ideal combination for achieving higher machining rate and lower overcut.

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STUDY OF THE MICROSTRUCTURES AND MECHANICAL PROPERTIES OF ALUMINIUM HYBRID COMPOSITES WITH SiC AND Al_2O_3

ŠTUDIJA MIKROSTRUKTUR IN MEHANSKIH LASTNOSTI ALUMINIJEVIH HIBRIDNIH KOMPOZITOV S SiC IN Al_2O_3

Palanisamy Pugalenthi[1], Murugesan Jayaraman[2], Venkatajalapathy Subburam[1]

[1]Paavai Engineering College, Department of Mechanical Engineering, NH-44, Pachal, Namakkal District, Pincode: 637018, Tamilnadu, India
[2]Velalar College of Engineering and Technology, Department of Mechanical Engineering, Thindal, Erode District, Pincode: 638012, Tamilnadu, India

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Aluminium metal-matrix composites are widely produced with different ceramic compounds as reinforcements to enhance their properties and to suit various structural applications. The present work involves the fabrication of Al7075 composites with silicon carbide (SiC) and aluminum oxide (Al_2O_3) as reinforcements through stir casting. Four specimens were produced with different compositions comprising SiC (3, 5, 7 and 9 *w*/%) and Al_2O_3 2 *w*/% in all the combinations. Mechanical properties like ultimate tensile strength (UTS), yield strength (YS), percentage of elongation (% of elongation) and hardness (VHN) were examined, along with fractography studies. The microstructural characterization of the composites was also studied through micrographs obtained from the scanning electron microscope (SEM). The test results revealed that the increase in the *w*/% fractions of the reinforcement materials caused an increase in the tensile strength, yield strength and hardness of the aluminium composite, except for the % of elongation, which is reduced with the addition of ceramic particles.

Keywords: stir-casting method, hybrid composites, mechanical properties and microstructure

Kompoziti s kovinsko osnovo iz aluminija se pogosto izdelujejo z različnimi keramičnimi spojinami kot ojačitveno fazo, in s tem postanejo uporabni za izdelavo različnih strukturnih aplikacij. V pričujoči raziskavi so avtorji izdelali kompozite na osnovi Al zlitine 7075 z dodatkom delcev silicijevega karbida (SiC) in aluminijevega oksida (Al_2O_3) kot ojačitveno fazo med premešavanjem taline. Izdelali so štiri vzorce z različno vsebnostjo SiC (3, 5, 7 in 9 *w*/%) in v vseh primerih še z dodatkom 2 *w*/% Al_2O_3. Določili so mehanske lastnosti izdelanih kompozitov - natezno trdnost pri pretrgu (UTS), mejo plastičnosti (YS), raztezek (%) in trdoto (VHN). Nato so izvedli še analize prelomov (fraktografijo) nateznih preizkušancev s pomočjo vrstičnega elektronskega mikroskopa (SEM). Rezultati preiskav so pokazali, da povečanje dodatka ojačitvene faze v obliki keramičnih delcev povzroči zvišanje natezne trdnosti, meje plastičnosti in trdote, zmanjša pa se raztezek.

Ključne besede: metoda litja s premešavanjem, hibridni kompoziti, mehanske lastnosti in mikrostruktura

1 INTRODUCTION

Composite materials combine the desirable properties of the constituent materials and provide enhanced physical and mechanical properties. Composite materials find applications in almost all industries today. The automobile and aerospace industries are constantly in search of composites that possess higher strength and are lighter in weight for structural applications. Aluminium is preferred as a structural material in these areas because of its light weight. Ceramic particulates are added to the aluminium base matrix as a reinforcement to fabricate aluminium metal-matrix composites (AMMCs), which provide improved strength. Among the aluminium alloy series, the aluminium 7075 alloy has many favorable properties, like higher strength, good wear resistance, higher toughness and stiffness. The ceramic reinforcements added to the aluminium matrix also give further improvement to the endurance at higher operating temperatures. Most industries prefer metal-matrix composites with aluminium to take advantage of its ease of fabrication. Though many casting methods are available, stir casting is considered for manufacturing AMMCs as the technique is simple, economical and because of its capability for large volume production.

The tensile strength and fatigue strengths of a SiC-whisker-reinforced AA7075 specimen produced by the powder metallurgy method was tested by Komai et al.[1] in normal atmospheric and water environments. It was observed in the report that all the mechanical properties showed enhanced values, except the elongation to failure. The pattern of propagation of a crack for fatigue failure was also studied. The water environment was found to give a shorter fatigue life due to the effect of corrosion. Azim et al.[2] produced a MMC with Al2024 base material and Al_2O_3 as the ceramic reinforcement to study the change in the mechanical peoperties. The observtions revealed that the increments in the volume percentage of Al_2O_3 caused an increase in the ultimate tensile strength and a decrease in the ductility.

*Corresponding author e-mail:
mecpugal@yahoo.com

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Electrochemical Micromachining of Aluminium Alloy Composite

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- S. Ramesh (1) Email author (ramesh_1968in@yahoo.com)
- V. Subburam (2)

1. Department of Mechanical Engineering, KCG College of Technology, , Chennai, India
2. Department of Mechanical Engineering, Paavai Engineering College, , Namakkal, India

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Abstract

Electrochemical micromachining (EMM) is in the forefront among the non-traditional machining processes that are brought into micromachining domain. The major influencing factors of EMM process are more sensitive at the micro-level machining, and for achieving precision the right combination of parameters is essential. Continuous research works are required to study and analyse every new possible set of variables that can be applied to carry out this machining process. The objective of the present research work is to generate micro-holes using an aluminium composite workpiece through EMM and study the capability of the process to machine such non-homogenous materials. An EMM set-up developed with pulse power facility for experimental purposes was used to carry out the experiments. The experimentation included an aluminium composite containing ceramic reinforcement as work specimen (anode), a hollow brass electrode as the machining tool and the solution of NaCl (sodium chloride) as the ion-conducting medium (electrolyte) to facilitate the process. The effect of input factors like voltage, current and pulse-on time on response parameters such as machining rate (MR) and overcut (RC) was studied from experimental observations. It was a general observation that speeding up the machining rate with higher level input of parameters affects the accuracy of the process outcome. Generally, the response of the EMM process is slow and requires time to produce machining accuracy.

Keywords

Experimental investigation of future HFC/HCs Blended refrigerants for use in small capacity Window Air-conditioner

P.Elumalai[1], R.Vijayan[2], V.Subburam[3]
Department of Mechanical Engineering,
[1,3]Paavai Engineering College, Namakkal, Tamilnadu, India.
[2]Government College of Engineering, Salem, Tamilnadu, India.
E-mail ID: eluammu@gmail.com

***Abstract*:** This paper deals with the experimental study of the air conditioning system working with a new alternative for R22 in view of reducing the global warming effect. The investigations pertain to five refrigerant mixtures with varying mass compositions of R152a /R290/R600.The properties of new proposed mixtures were obtained from REFPROP7.0 software for the operating temperature ranging from 0°C to 60 °C. The performance of the refrigerant mixtures was evaluated from the output parameters like Co-efficient of performance (COP), power consumption, mass flow rate, refrigeration effect and pressure ratio. From the investigations, the mixture with R152a-10% / R290-10%/ R600 - 80% was found to give 5.27% higher COP and 5.22% lower power consumption than that of R22. This refrigerant mixture with lower global warming potential could be used as an alternative working fluid for residential air conditioning applications.

Keywords: Refrigerant, Ozone depletion, global warming, Co-efficient of performance, Evaporator Temperature.

1. INTRODUCTION

In the global concern, the role of refrigerants is considered vital in contributing for the ozone layer depletion along with all other sources pertaining to global warming. Even though the traditional refrigerants have desirable thermodynamic properties like higher energy efficiency, stability, flammability and non-toxic characteristics, they have hazardous effect on the stratospheric region which in turn increases the earth temperature.

As a step towards preventing global warming, CFCs (chlorofluorocarbons) have been banned by the Montreal Protocol. By the next half decade, HCFCs (Hydrochloroflourocarbons) will also be phased out due to their high Global Warming Potential (GWP). After 2020, in order to obtain good energy efficiency and to protect the earth surface, all countries are expected to proceed with eco-friendly working fluids for refrigeration and Air-conditioning applications.

D.B.Jabaraj et al (2006) studied that the performance of R407C/HC290/HC600a refrigerant mixtures by experimentally testing in one TR window air conditioner and the COP was found to be 11.91- `13.24% higher than that of R22 .The performance revealed that R407C/HC refrigerant blends could be an alternative to R22 [1]. J.H.Wu et al (2012)

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Flexural and Impact Behaviour of Kevlar/E-Glass Reinforced Epoxy Matrix Composites

T. Thangavel[1], K. Anand[2], S. Chandru[3], G. Chenna Krishnan[4], P. Boopathi[5]
[1] *Assistant Professor, Mechanical Department, Paavai Engineering College, Tamilnadu, India,*
[2] *Assistant Professor, Mechanical Department, Paavai Engineering College, Tamilnadu, India,*
[3] *UG Scholar, Mechanical Department, Paavai Engineering College, Tamilnadu, India,*
[4] *UG Scholar, Mechanical Department, Paavai Engineering College, Tamilnadu, India,*
[5] *UG Scholar, Mechanical Department, Paavai Engineering College, Tamilnadu, India,*

Abstract: ***Kevlar is a revolutionary material that utilized for making automobile, marine, aerospace, body and vehicle armors for past few decades. It has better mechanical properties like higher strength to mass ratio, resistance to wear, tear, penetrations and high strength, modulus, toughness and thermal stability. Whereas E-glass fiber is well known for its commercial applications and properties like dimensional stability, outstanding electrical resistance, and durability. This proposed work focuses and studies flexural and impact response of Kevlar and E-glass fiber reinforced epoxy matrix hybrid composites made by vacuum assisted resin transfer molding (VARTM).***
Keywords: Kevlar, E-Glass, Impact Response, Vacuum Assisted Resin Transfer Molding (VARTM).

I. INTRODUCTION

Polymer matrix composites possess enhanced mechanical properties like tensile and impact strength, strength to weight ratio. Due to its low weight nature fiber reinforced polymer matrix composites are utilized over past few decades as an alternative for traditionally used automotive materials for achieving better fuel efficiency [1]. Vacuum assisted resin transfer molding method is an most preferable process for producing less porous and defects free fiber laminates. Santhosh [2] studied electrical and mechanical properties of Kevlar, basalt reinforced composites of various volume fractions and stated that kevlar/E-Glass reinforced composites shows higher impact and flexural properties than basalt reinforced composites and contains even dispersion of fibers in the resin matrix. Fiore fabricated fiber laminates by vacuum molding and expressed that synthetic fibers are highly water resistance when compared to natural fiber composites and mechanical properties of synthetic fiber laminates are 50% higher than natural fibers [3].
Bandaru et al. Fabricated plain woven two dimensional, orthogonal three dimensional and angle interlock three dimensional kevlar polyurethane laminates and studied its low velocity impact behaviour. They reported that angle interlock 3D kevlar composites shows better energy absorption than other laminates [4]. Fiber volume fraction and stacking sequence are the important parameters to be considered for obtaining better composites with high mechanical properties [5]. Hybrid laminates prepared via vacuum assisted resin transfer molding process in combination with Glass fiber portrays high yield point, and young's modulus [6].
In [7] Asi reported that glass fiber reinforcement in the hybrid composites results in higher tensile and shear strength. Zhu [8] tested kevlar 49 under quasi-static loading with various gauge lengths in high-rate servo-hydraulic testing system and reported that mechanical strength of the composites lowered with increase in gauge lengths. Roman analyzed the tensile properties of unidirectional kevlar reinforced epoxy matrix composites. The catastrophic failure of the kevlar fiber occurred due to high short loading [9]
Kevlar fibers are widely used in defence, aerospace and marine industries due to its specific nature of higher energy absorption and impact load resistance. 80% of the body armor and vehicle armors in the military contains major contribution of Kevlar fiber. The polyamide aromatic structure of the kevlar possess ultimate endurance to the Kevlar configuration [10-14]. Alireza et al [15] analyzed the effect of filler reinforcement into the composites and stated that reinforcement of fillers enhances tensile strength and young's modulus of the composite products.
The proposed work focuses on fabrication of kevlar and E-Glass reinforced epoxy matrix composites by vacuum assisted resin transfer molding with various volume fractions and investigating its impact and flexural behaviour for assimilating optimum hybrid structure.

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Mechanical Behaviour of Aluminium Powder Modified Carbon/Basalt Reinforced Vinyl Ester Composites

M.S. Santhosh[1*], T. Thangavel[2], R. Sasikumar[1], M. Vignesh[3], M. Vishnu[4], M. Vinu[5], V.T. Vinvath Ragav[6]

[1*] *Selvam Composite Materials Research Laboratory, Tamilnadu, India*
[1] *Selvam College of Technology, Tamilnadu, India*
[2 – 6] *Department of Mechanical Engineering, Paavai Engineering College, Tamilnadu, India*
Corresponding Author: M.S. Santhosh

Abstract: *Polymer matrix composites (PMCs) deserves a significant role in the new age engineering materials due to its unique properties like formability, room temperature processing, and economic nature. Main aspire of this proposed work is to investigate mechanical behaviour (flexural and tensile) of unfilled and 5, 10 Wt. % aluminium powder filled carbon/basalt hybrid composites produced via open mould followed by a compression process. Results collected from the experiments reveals that the inclusion of nano-aluminum powder greatly influences the mechanical properties of carbon/basalt/vinyl ester composites. Void fraction and densities intensified reasonably by the annexation of Al powder while the tensile strength shows a steady decrease. Carbon/basalt with 5 wt. % Al possess better properties whereas 10 wt. % Al reinforcement shows better tensile modulus. The Al included fiber configurations were compared with unreinforced composite laminate to grasp the optimum filler reinforcement percentage. SEM images of the fractured surfaces also analyzed for a better understanding of failure conditions.*

Index Terms: *Mechanical behaviour, Carbon, Basalt, Aluminium powder, Open mould, Reinforcement, Vinyl ester, Polymer matrix composite.*

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I. Introduction

Composites made with basalt and carbon fiber is very prominent in the various engineering industries such as commercial vehicle components, defence, and aerospace industries because of its peculiar properties like strength to weight ratio, flexibility in design and formability [1]. As a reinforcement uni and bidirectional carbon, basalt fiber fabric plays momentous role in the replacement of various conventional metal counterparts due to its wider availability and room temperature processing methods [2]. Santhosh et al fabricated kevlar/E-Glass and basalt/E-Glass reinforced hybrid epoxy matrix composites and revealed that higher volume of basalt improves the flexural behaviour whereas higher kevlar reinforcement improves impact energy absorption [3]. Nadia et al prepared the epoxy composites with different filler percentage of Al_2O_3 and SiO_2 (0.5%, 1%, 1.5%, 2%, 2.5%, and 3%) nano particles to interrogate its impact and mechanical properties and stated that Al_2O_3/SiC addition lowers the wear resistance and improves the hardness and impact energy absorption natures fairly (Up to 30%) [4].

Raju et al produced alumina filled glass fiber epoxy composites with 0, 5, 7.5 and 10 wt. % to test its wear, mechanical properties and proposed that up to 10% of Alumina inclusion significantly improves the tensile modulus and wear resistance. More than 10 % of reinforcement shows a gradual decrease in wear resistance [5]. Yusriah studied mechanical response of phenolic hollow microspheres (PHMS) and calcium carbonate (CC) filled (1%, 3%, and 5% by weight) vinyl ester composites and stated that CC and PHMS inclusion greatly improves specific flexural and impact strengths [6]. Ali Reza included multiwall carbon nanotube into silicone elastomer and reported that MWCNT reasonably enhances the mechanical and flexural properties of rubber matrix [7]. Fatigue and thermal conductivity of the epoxy matrix aluminium particulate composites were studied by Senthil kumar et al. They reported that the resultant composites possess better service temperature and mouldability [8].

Rout et al developed hybrid multiphase epoxy composites filled with rice husk particles to analyse mechanical, wear and corrosion responses. They revealed that the inclusion of rice husk steadily improves the mechanical and wear behaviour of hybrid composites [9]. Santhosh fabricated hybrid Al reinforced GLARE composites and analysed its impact and flexural behaviour. He stated that up to 30% of Al reinforcement greatly improved flexural and impact resistance [10]. Reinforcement of nano aluminum particles or fillers with the

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Fabrication and Impact Behaviour Study of Industrial Safety Helmet

R. Hariharan[1], R. Mohanraj[2], G. Karthikeyan[3], T. Thangavel[4], N. Lokeshwaran[5]
[1, 2, 3] *Mechanical Department, Selvam College of Technology*
[4, 5] *Mechanical Department, Paavai Engineering College*

Abstract: ***The skin that covers the head (scalp) plays a vital role in the protection of head from various impact threats. Scalp is an only sliding interface between helmet and skull, also it is a first tissue of the head which undergoes impact in both with and without helmet conditions. Helmets are universally endorsed by all industrialists and motorcyclists as effective head protection system. It is very important to analyse and observe the overall impact behaviour (Ballistic behaviour) of the industrial helmet in order to prevent accidental defects. In recent times there is huge helmet awareness (material and maximum impact energy resisting or dissipating capacity) among the people of emerging countries like India and China. In this present investigation, the industrial helmet of standard dimension reinforced with E-Glass fiber / Epoxy matrix is fabricated by resin infusion moulding (RIM) and analysed for obtaining its maximum impact resistance. The proposed outcome of this project is an alternate for present industry helmets which provides ultimate impact resistance and protection to human head.***
Keywords: Ballistic Load, Industrial Helmet, Impact Behaviour, E-Glass Fiber, Epoxy Matrix, Head Protection, Resin Infusion Moulding.

I. INTRODUCTION

Presently composites which made up of polymer matrix plays major role in the fabrication of all commercial products like daily needs, industrial goods and household applications due to its lightweight, improved mechanical properties, handling mode and easy fabrication methods. Helmets are one of the most important protection casing for motorcycle drivers and industrial machine operators, which is economical safety method too.

The deliberate need of industrial and vehicle safety helmets all over the world attracts researchers to work and analyse on safety behaviour of head armours. Its increasing demand pushes industrialists and companies to commercialize economical and high strength helmets.

A. Industrial Safety Helmets

Even after the reasonable implementation of artificial intelligence and robotic techniques still in most of the industrial environments like mining, building and tunnel constructions, military, power plants, and production industries human intervention is inevitable and there is a possibility of head injuries, threats are constantly presents. The industrial helmets quietly protects the worker from physical injuries that occurs by collision or falling objects.

The design and development of safety helmets for specific work environment is fully depends on two important things, nature of working environment and materials that the employee deals. Initially these phenomena is called safety assessment. The more harmful material the employee deals, the more consideration should be on the helmet design and material. The motorcycle and industrial safety helmets are designed in such a way that it should withstand or dissipate high-velocity impact loads, low or zero thermal and electrical conductivity, penetration resistant and proper adjustment, easy handling.

B. E-Glass Fiber

E-Glass fiber is one of the significant and economical reinforcement used worldwide to fabricate various fiber reinforced commercial and industrial products. Its ultimate mechanical properties, low cost, lightweight, dimensional stability, fire resistance, durability, and electrical resistance nature E-Glass became a crucial substitute for various conventional metals and wood products.

The present investigation focuses on following aspects,

1) Fabrication of standard industrial helmet by resin infusion moulding process reinforced with E-Glass fiber Epoxy matrix.
2) Izod and Charpy testing for predicting ultimate impact strength.

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Fabrication and Characterization of Basalt/Kevlar/Aluminium Fiber Metal Laminates for Automobile Applications

M.S. Santhosh[1], R. Sasikumar[2], T. Thangavel[3], A. Pradeep[4], K. Poovarasan[5], S. Periyasamy[6], T. Premkumar[7]

[1] *Junior Research Fellow, Selvam Composite Materials Research Laboratory, Tamilnadu, India.*

[2] *Professor & Director Research, Selvam College of Technology, Tamilnadu, India.*

[3] *Assistant Professor, Mechanical Department, Paavai Engineering College, Tamilnadu, India.*

[4, 5, 6, 7] *UG Scholars, Mechanical Department, Paavai Engineering College, Tamilnadu, India.*

Abstract

Sandwich fiber metal laminates (FMLs) grabs significant growing attention among disparate engineering industries such as defense, aerospace and commercial vehicle manufacturers, due to its improved mechanical, thermal and electrical properties. Over the past few decades, FMLs were used as an impeccable identical for classical fiber composites like carbon and E-Glass. This prospective work interrogates mechanical behaviour of Basalt/Kevlar/AA 8090 reinforced FML fabricated by hand layup - compression moulding process. The low-velocity impact, flexural and tensile behavior of fabricated FMLs were calculated by various mechanical testings done as per ASTM standards. Fractured surface of the FML also analyzed by scanning electron microscopic images for understanding the fracture behavior of the proposed outcome.

Keywords: Fiber metal laminate, Basalt, Kevlar, Al 8090, Flexural, Low velocity impact, compression moulding.

1. INTRODUCTION

Fiber reinforced composites has a significant impact in production of engineering materials. It occupies huge percentage in the total fabrication due to its admirable mechanical properties like strength to weight ratio and cost-effectiveness. Recent researchers focusing on use fiber reinforced metal laminates for various automobile

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A Concept of Internal Combustion Engine with Homogeneous Combustion in a Porous Medium

[1]Mr. R. Sateesh., ME.,
Assistant professor,
Department of Mechanical Engineering,
Gnanamani College of technology,
Namakkal, Tamilnadu, India.

[2]Mr. R. Karthick., ME.,
Assistant Professor,
Department of Mechanical Engineering,
Paavai Engineering College,
Namakkal, Tamilnadu, India.

[3]Mr. S. Arunraj., DME.,
UG student,
Department of Mechanical Engineering,
Paavai Engineering College,
Namakkal, Tamilnadu, India.

[4]Mr. J. Ajitkumar., DME.,
UG student,
Department of Mechanical Engineering,
Paavai Engineering College,
Namakkal, Tamilnadu, India.

***Abstract* - The advantages of homogeneous combustion in internal combustion (I.C.) engines are well known and many research groups all over the world are working on its practical realization. A new combustion concept that fulfils all requirements to perform homogeneous combustion in I.C. engines using the Porous Medium Combustion Engine, called "PM-engine" has been proposed. This is an I.C. engine with the following processes realized in a porous medium: internal heat recuperation, fuel injection and vaporization, mixing with air, homogenization, 3D thermal self-ignition followed by a homogeneous combustion.**

I. INTRODUCTION

The nature of the mixture formation and the followed combustion processes realized in direct injection engines, indicate lack of mechanisms for controlling the mixture formation and homogenization of the sequence of process and, hence, do not allow homogeneous combustion. The entire homogenization, however, is necessary for significant reduction of engine emissions in primary combustion. There is also no doubt today, that the future trend of development means homogenization of the combustion process with a goal to develop such combustion systems that could operate under part to full loads with homogeneous combustion.

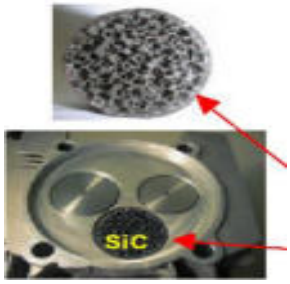

Fig.1 View of PM-engine head and SiC reactor

II. HOMOGENEOUS COMBUSTION

Homogeneous combustion in an IC engine is defined as a process characterized by a 3D-ignition of the homogeneous charge with simultaneous volumetric combustion, hence, ensuring a homogeneous temperature field. According to the definition given above, three steps of the mixture formation and combustion may be selected that define the ability of a given combustion system to operate as a homogeneous combustion system:

- Homogenization of charge.
- Ignition conditions.
- Combustion process and temperature field.

Four different ignition techniques may be selected:

- Local ignition (e.g. spark plug).
- Thermal self-ignition (e.g. compression ignition).
- Controlled auto-ignition (e.g. low temperature chemical ignition).
- 3D thermal PM self-ignition (e.g. 3D-grid-structure of a high temperature).

The last considered ignition system, uses a 3D structured porous medium (PM) for the volumetric ignition of homogeneous charge. The PM has homogeneous surface temperature over most of the PM volume, higher than the ignition temperature. In this case the PM volume defines the combustion chamber volume.

Thermodynamically speaking, the porous medium is here characterized by a high heat capacity and by a large specific surface area. As a model, we could consider the 3D-structure of the porous medium as a large number of "hot spots" homogeneously distributed throughout the combustion chamber volume. Because of this feature a thermally controlled 3D-ignition can be achieved.

Let us consider four possible combustion modes of a homogeneous charge:

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CLUTCH PLATE FABRICATION BY USING AL-SIC METAL MATRIX COMPOSITES

K.Ramesh[1], Karthick[2], S.Arunraj[3], J.Ajitkumar[4]
[1]Assistant professor, Department of Mechanical Engineering,
Karpagam College of Engineering, Coimbatore
[2]Assistant Professor, Department of Mechanical Engineering,
Paavai Engineering College, Namakkal
[3,4]UG student, Department of Mechanical Engineering,
Paavai Engineering College, Namakkal

Abstract: In this paper, fabrication of Stircasting setup which was used for the production of clutch plate using 7075 Al-SiC Metal Matrix Composites was discussed. The mechanical properties, advantages of MMC's, experimental procedure of stir casting were explained. The present investigation shows that MMCs have considerable higher wear resistance than conventional grey cast iron while sliding against automobile clutch plate under identical conditions.

1. Introduction

The ever increasing demand for light weight, fuel efficiency and comfort in automobile industries has lead to the development of advanced materials along with optimized design. There is a need for materials with properties such as low density, improved strength, stiffness and wear resistance has led to the introduction of MMCs. MMCs are widely used in industries, as they have excellent mechanical properties in wear resistance. The introduction of 7075aluminium- silicon carbide composite materials made it possible to reduce the weight of clutch plate. The silicon carbide reinforced aluminum composites are increasingly used as substitute materials for cylinder liners, pistons, cylinder heads, brake rotors and calibers in automobile industries. The addition of low volume fraction of silicon carbide particle (upto 8%) to aluminium silicon alloys significantly reduces the wear rate and the wear resistance has been found to increase with percentage of reinforcement. The wear and frictional behavior of clutch disc is very complex and is characterized by non steady state, high pressure and high temperature process.

In our paper we are going to discuss about fabrication of clutch disc using 7075Aluminium- Silicon Carbide composite with 25% of silicon carbide by Stir Casting method.

2. Definition of Composite

A composite is a structural material consists of two or more combined constituents that are combined at a macroscopic level and are not soluble in each other. Generally, a composite material is composed of reinforcement (fibers, plastics, flakes and fillers) embedded in a matrix (polymers, metals or ceramics). The matrix holds the reinforcement to form a desired shape while the reinforcement improves the overall mechanical properties of the matrix. The new combined material (composite material) will exhibit better strength when compared with other structural materials. Composite materials are cohesive structures made by physically combining two or more compatible materials.

3. Metal Matrix Composites (MMCs)

Metal Matrix Composites is a combination of a Metal Matrix and a reinforcement component. The matrix is defined as a metal in all cases, but a pure metal is rarely used as the matrix, it is generally an alloy. In productivity of MMCs the matrix and the reinforcement are mixed together. The main characteristics of MMCs include superior strength, stiffness, high wear resistance and high creep resistance on comparison with their corresponding wrought alloys.

Figure 1

Experimental investigation of future HFC/HCs Blended refrigerants for use in small capacity Window Air-conditioner

P.Elumalai[1], R.Vijayan[2], V.Subburam[3]
Department of Mechanical Engineering,
[1,3]Paavai Engineering College, Namakkal, Tamilnadu, India.
[2]Government College of Engineering, Salem, Tamilnadu, India.
E-mail ID: eluammu@gmail.com

***Abstract*:** This paper deals with the experimental study of the air conditioning system working with a new alternative for R22 in view of reducing the global warming effect. The investigations pertain to five refrigerant mixtures with varying mass compositions of R152a /R290/R600.The properties of new proposed mixtures were obtained from REFPROP7.0 software for the operating temperature ranging from 0°C to 60 °C. The performance of the refrigerant mixtures was evaluated from the output parameters like Co-efficient of performance (COP), power consumption, mass flow rate, refrigeration effect and pressure ratio. From the investigations, the mixture with R152a-10% / R290-10%/ R600 - 80% was found to give 5.27% higher COP and 5.22% lower power consumption than that of R22. This refrigerant mixture with lower global warming potential could be used as an alternative working fluid for residential air conditioning applications.

Keywords: Refrigerant, Ozone depletion, global warming, Co-efficient of performance, Evaporator Temperature.

1. INTRODUCTION

In the global concern, the role of refrigerants is considered vital in contributing for the ozone layer depletion along with all other sources pertaining to global warming. Even though the traditional refrigerants have desirable thermodynamic properties like higher energy efficiency, stability, flammability and non-toxic characteristics, they have hazardous effect on the stratospheric region which in turn increases the earth temperature.

As a step towards preventing global warming, CFCs (chlorofluorocarbons) have been banned by the Montreal Protocol. By the next half decade, HCFCs (Hydrochloroflourocarbons) will also be phased out due to their high Global Warming Potential (GWP). After 2020, in order to obtain good energy efficiency and to protect the earth surface, all countries are expected to proceed with eco-friendly working fluids for refrigeration and Air-conditioning applications.

D.B.Jabaraj et al (2006) studied that the performance of R407C/HC290/HC600a refrigerant mixtures by experimentally testing in one TR window air conditioner and the COP was found to be 11.91- `13.24% higher than that of R22 .The performance revealed that R407C/HC refrigerant blends could be an alternative to R22 [1]. J.H.Wu et al (2012)

A Project of Cleaning Smog and Particulates by Using Smog Cleaner with Negative-Ion Generator

R. Jagan[1], R. GokulaKrishnan[2], S. Ramar[3], S. Manikandan[4], D.R.P. Rajarathnam[5]

[1,2,3]*Student, Department of Mechatronics, Paavai Engineering College (Autonomous),Tamil Nadu, India.*

[4] *Assistant professor, Department of Mechatronics, Paavai Engineering College (Autonomous), Tamil Nadu, India.*

[5] *Professor, Department of Mechatronics, Paavai Engineering College (Autonomous), Tamil Nadu, India.*

ABSTRACT

The main objective of this project is to clean smog from the environment by cleaning micro-level dust particles. Smog is a mixture of smoke and fog, it contains a mixture of air pollutants and fog with suspended dust particles, it causes major health problems and reduces visibility. The smog was cleaned in special process by using negative ion generator, the negative ions which are generated by Air-ionizer are negative charged particles that are highly attracted to dust particles, it makes particulates into clusters hence it can be easily captures by filter which is fitted at the outlet. Basically fog is a high dense air with suspended water droplets, the density of fog is reduced by heating the intake fog by heating element and this heating element temperature is controlled by digital temperature controller thermostat which is programmed as per our convenience. We use timer for controlling intake and exhaust fans motor controls for optimization.

Keywords –*Heating coil, Negative-ion generator, Thermostat, Timer.*

1. INTRODUCTION

The mixture of smoke and fog causes smog, it causes major health problems. The air pollutant is major reason for smog formation, it includes particulates, sulphur dioxide, nitrogen oxides and other gases. This gas combines with ozone and particulates with the presence of sunlight to form smog, this is due to photochemical reactions of sunlight with these gases. According to National air quality Index in India permissible level of Particulate Matter ($PM_{2.5}$) is 31µg/m^3, but current level of $PM_{2.5}$ (particles lesser then 2.5 micrometre in diameter) exceeds more than 60µg/m^3 based on November 2009 air standard reports. The particulate matter can dame stones and infrastructures, it can damage forest and crops it widely affects agricultural crops and reduce yield. Major respiratory health problems are caused by these air suspended particles. This project was made for cleaning particulates presence in the atmosphere and smog, exposure on smog may affects human health. Most of the countries like India, China, United Kingdom, United States, United Arab Emirates and many other countries facing struggles of smog if particulate matter was removed smog it will adversely reduce smog occurrence on metro cities and atmosphere. China alone can spend nearly 44 billion dollars for clean energy projects.

AUTOMATIC RAIN SENSING WIPER AND HEADLIGHT CONTROL IN THE VEHICLE

Rajarathnam.DRP[1], Vibinstalin.C[2] , Dinesh.S[3], Vijaya Kumar.A[4], Vijay.P[5],Venkatesan.K[6]

[1] *Associate professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[2] *Assistant Professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[3] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[4] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[5] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[6] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*

ABSTRACT

Wiper is an essential component that used to wipe raindrops or any water from the vehicle's windscreen and Head light is used to safety purpose during night. The previous system used to activate the wiper manually and the process of pulling up the wiper is difficult to be handled and now a days the headlight also glows in a day time. This day time AHO reduce the vehicle mileage. Thus, this method is planned to unravel these issues. The objectives of this project are to upgrade the older cars system by providing automatic wiping and headlight system , to improve the system by using sensor with actuator and to style a basic program that may totally operate with the system. The thought of this planned wiper system is comparable with alternative existing standard wiper. In spite of removing water from windscreen, this system also will be upgraded to an automatic control system by using a arduino UNO, rain detecting and intensity sensor, fog sensor and day night sensor.

Keyword : - *Rain sensor, Arduino uno, LDR, Head light, wiper motor*

1. INTRODUCTION

All the four wheelers area unit equipped with the wipers. These wipers are used to wipe the water on the windshield during rainy seasons so as to obtain clear vision. The wipers invented previously used to oscillate at a slow speed. Sometimes this cause the distraction to the driver's visibility. This diode to the invention of various speed wiper motors. The previous system accustomed activate the wiper manually and also the method of propulsion up the wiper is tough to be handled.To provide tension free driving, automatic wipers were enforced.Now a day the headlight also glows in a day time.

This day time AHO reduce the vehicle mileage. During night driving tons of glare is intimate by the motive force of the vehicle. He may sometimes face the Toxler Effect and this may lead to accident.The objectives of this project are to upgrade the older cars system by providing automatic wiping and headlight system. This project which will provide ease of operation and look after the human comfort.

2.HARDWARE DESCRIPTION

2.1 Arduino Uno

The Arduino UNO could be a wide used ASCII text file microcontroller board supported the ATmeg328Pmicrocontroller and developed by Arduino.cc the board is provided with sets of digital and analog

MOBILE CONTROLLED PICK AND PLACE ROBOT USING ARDUINO

D.R.P.Rajarathinam[1],R.Arunbabu[2],M.Danujan[3],B.Jasper Fernando[4],
S.Vinoth Kumar[5],T.Sethupathi[6]

[1]*Professor,Department of Mechatronics,Paavai Engineering College,Namakkal,India*
[2]*Asst,professor,Department of Mechatronics,Paavai Engineering College,Namakkal,India*
[3]*Student,Department of Mechatronics,Paavai Engineering College,Namakkal,India*
[4]*Student,Department of Mechatronics,Paavai Engineering College,Namakkal,India*
[5]*Student,Department of Mechatronics,Paavai Engineering College,Namakkal,India*
[6]*Student,Department of Mechatronics,Paavai Engineering College,Namakkal,India*

ABSTRACT

The work is designed to develop the pick and place robotic arm with a soft catching gripper that to lift hazardous object which cannot not be touched by human hands.The robot is controlled through Bluetooth using smartphone.It is built with servo motors. Arduino *controller is used in robotic arm process ,the movement of the robot is either forward,backward,left or right.The robotic arm is designed using servo motors,and it is interfaced with micro controller.The main advantage of soft catching gripper is to lift a hazardous object.it is controlled by using Bluetooth in smart phone.*

Keyword—*Arduinouno,Bluetooth,servmotor*

1. INTRODUCTION

The project aims in designing a Robot arm which is operated using bluetooth and also which is capable of Picking and Placing of many objects.The advent of latest high-speed technology and therefore the growing bluetooth capability provided realistic chance for brand spanking new automaton managements and realization of latest ways of control theory.This technical improvement at the side of the requirement for top performance robots created quicker, more accurate and more intelligent robots using new robots control devices, new drivers and advanced control algorithms.This project describes a brand new economical resolution of automaton management systems.The bestowed automaton arm system are often used for various refined robotic applications.The modules in the project are: Bluetooth interfaced to Microcontroller, Robot arm which is capable of Picking and placing objects, Servo motors is attached to the robot arm for themovement of mechanism andMicrocontroller that performsthe dominant operations of mechanism arm in choosing and putting of objects.The controlling device of the whole system is a Microcontroller to which bluetooth; Servo motors of robot arm are interfaced through a motor driver. Whenever the appropriate keys on mobile application then the data will betransmitted through bluetooth to the microcontroller.The Microcontrollerchecks the data with the program embedded in it and performs appropria te actions onthe robot arm. The Microcontroller is programmedusingClanguage.An embedded system may be a combination of software package and hardware to perform a zealous task.Some of the most devices employed in embedded product square Measure Microprocessors and Microcontrollers. Microprocessors square measure remarked as generalpurpose processors as they merely settle for the inputs, process it and give the output.In contrast, a microcontrollernotonlyaccepts the dataas inputs however additionally manipulates it, interfaces the information with numerous devices, controls the information and therefore finally offers the result.The “Bluetooth controlled pick and place robot” using Arduino microcontroller is an exclusive project which is used to control speed and direction of Servo motor using general purpose bluetooth unremarkably.

PCB MANUFACTURING MACHINE USING HYBRID DNC MACHINE

RAJARANATHNAM D.R.P.[1] ,R.T.AJAYKARTHIK[2],ARUNKUMAR.G[3], GOWSIC RAJ.T[4]

Associate professor, Mechatronics Department, Paavai Engineering College, Tamilnadu, India

Associate professor, Mechatronics Department, Paavai Engineering College, Tamilnadu, India
Student, Mechatronics Department, Pavaai Engineering College, Tamilnadu, India
Student, Mechatronics Department, Pavaai Engineering College, Tamilnadu, India

ABSTRACT

Normally, for making PCB, we required more time for designing, printing etching also drilling. Hence to reduce time and more effort we are design this project. In this paper, the design of PCB milling and drilling machine, where the drill holes and circuit path are automatically find out the layout in EAGLE software. This paper focuses on the design and fabrication of automatic PCB milling and drilling machine for large production. This is the microcontroller based machine that uses path planning through the numerical codes for the circuit layout. In this project, multiple spindle or fixtures are controlled by single control unit, which is used to make the system more stable and accurate for high productivity.

Keyword: *Hybrid DNC, PCB Milling, Multiple Spindles, Common drive system.*

1. INTRODUCTION

The goal of this project is to design and implement a computer controlled PCB drilling machine. All the mechanical and electronics design are done from scratch to realize the project. There is also a computer program which communicates with the machine Electronics. Next chapter reveals the main blocks of the designed project. It gives introductory information about the whole system. Following chapters explain the main blocks of the system seperately in detail. The conclusions chapter includes the results of the project and future decisions. References are also added at the end of the project report. Finally, appendices list the source codes and circuit diagrams that are used in this project.

2.SYSTEM OVERVIEW

In electronics industry, Printed Circuit Boards (PCB) are designed using Computer Aided Design (CAD) progra ms. These programs generate a standardized file which is known as Excellon Drill File . Excellon files define t he position of hole locations on the designed PCB. This information is used in Computer Numerical Control (CNC) machines to drill the necessary holes on the PCB. In this project, the developed software takes the Excellon drill file of the PCB. Than it calculates the necessary parameters and sends the coordinate information to PIC16F877 m icrocontrollerunit(MCU)overs232 line. When MCU takes the necessary information, it immediately indexes th e stepper motor drivers. Stepper motor drivers turn the stepper motors according to the index pulses applie d to them. Stepper motors move the mechanism to accomplish the drilling of the PCBs

.

BIOMETRIC FINGERPRINT BASED SELF-AUTHENTIFICATION PROTECTED VOTING MACHINE

D.R.P.Rajarathinam[1], C.Vibinstalin[2] , Gnana sekar N[3],Ramesh M[4]

[1]*professor, Dept.of Mechatronics,Paavai Engineering College, Namakkal*

[2]*Assistant Professor,Dept.Of Mechatronics Engineering College, Namakkal*

[3,4]*UG student, Dept.of Mechatronics, Paavai Engineering College,Namakkal*

Abstract

Fingerprint Voting System was implemented with the Arduino technology. In this System a voter can poll his vote easily. In this database server all voters fingerprint information was stored to register in this system, the voter should scan the fingerprint during the poll time. This fingerprint information will be checked by the database server. Because all the fingerprint information about the voter would be already exist in the database, there is anything wrong, the system will not allow the voter to poll his or her vote. This system is helpful to avoiding the misuse of others vote. It is more Secured way. Fingerprint is an important identity of the user. Fingerprint Voting System is user-friendly. It has simple architecture, responses very quickly manner, Easy to carrying to polling center from the polling box, It provide easy and accurate counting without any troubles.

Keywords:- *Fingerprint sensor, arduino uno, LCD display, Indicators*

1.INTRODUCTION

Elections were a defining feature of democratic government, an electoral system is the set of rules that determines how elections and referendums were conducted and how their results were determined. Political electoral systems were organized by governments, while non-political elections may take place in business, non-profit organizations and informal organizations. There were so many electoral systems in world. That was paper ballots, punch cards and Optical Mark Sense Ballots. Some electoral systems elect a single winner to a unique position, such as prime minister, president or governor, while others elect multiple winners, such as members of parliament or boards of directors. The fingerprint voting system is an electronic voting machine using human biometric system. It's reducing the staff and polling time from paper voting system. In all the country votes were decided the feature. For that, we were introducing the new method of voting system to increase the standard of living.

According to the current system, votes could be counted manually so that there is more opportunity for occurring error, such as duplicates counting and completely missed counting Sometimes votes were even manipulated and motivate by political parties which lead to inaccurate vote and it will distort the results of an election in favour of certain candidates. This device can be useful for easy to handle, reliability and accurate. Vote counting is one of the vital activities in the election process. Failure to complete the count could lead to impact on people attitude towards the current government so that the election counting should be transparent, accurate and reliable then only public will feel confidence in the elections each polling station has a list of all voters assigned to the station and only those listed may vote in that Polling station.

DESIGN AND FABRICATION OF AUTOMATIC ANIMAL IDENTIFIER AND RESTRICTOR TO PREVENT HUMAN LIVEHOOD

Rajarathnam.DRP[1], Sumithra.C[2] , Lakshmanakumar.M[3], Sakthivel.P[4], Keerthivasan.K[5]

[1] *Associate professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[2] *Assistant Professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[3] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[4] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[5] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*

ABSTRACT

The main aim of our project is to safeguard the crops from harm caused by animal on slope areas yet by divert the animal. Animal sightation system is intended to detect the presence of animal and provide a warning , during this project we tend to used PIR sensors to sight the movement of the animal and send signal to the controller .It diverts the animal by manufacturing sound signal in additional, this signal is transmitted to GSM associate which provides an response to farmers and forest department straightaway.

Keyword : - *PIC 16F877A, PIR sensor, GSM modem, APR board.*

1. INTRODUCTION

Due to over population it happens a deforestation this leads to shortage of food, water and shelter in forest areas. So, Animals interference in residential areas is increasing day by day that affects human life and property causes human animal conflict, however as per nature rule each living creature on this earth has necessary role in eco-system. Agriculture is that the backbone of the economy however due to animal interference in agricultural lands, there'll be immense loss of crops. Elephants and different animals coming back in to contact with humans, impact negatively in varied means that like by depredation of crops, damaging grain stores, water provides, homes and different assets, injuring and death of humans. Farmers in India face serious threats from pests, natural calamities &damage by animals leading to lower yields ancient ways followed by farmers aren't that effective and it's not possible to rent guards to stay a watch on crops and stop wild animals. Since safety of each human and animal is equally important. So, animal detection system is important in farm areas.

2. LITERATURE SURVEY

As per Navya Amin, in his paper of Obstacles distance measurement using ultrasonic sensor , he developed a module which is useful to avoid collision between two parts [1]. As per Anca Discant, in his paper of Sensors for obstacles detection, he developed a sensor used to identity the obstacles by the combination of active passive sensors [2]. As per Artur Frankiewicz, in his paper of Smart passive infrared sensors, he developed a passive infrared sensors which is used for the motion detection and recognition [3]. As per Baharuddin Mustapha, in his

DESIGN AND FABRICATION OF SURVEILLANCE DRONE IN CAVES

Rajarathnam.DRP[1], Arunbabu.R[2] , Suresh Kumar.M[3], Dineshwaran.S[4], Dhilip.A[5], NandhaKumar.S[6]

[1] *Associate professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[2] *Assistant Professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[3] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[4] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[5] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[6] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*

ABSTRACT

There are several advancements within the field of region and aeronautics. Scientists have more and more began to concentrate on VTOL (vertical take - off and landing) aircrafts. we've got engineered a miniature VTOL twinrotor UAV. UAVs have begun to grab plenty of attention nowadays because of its various applications like police work and relief. Twinrotor may be a quite a eggbeater having 2 main propellers rather than one and no tail fin. All 3 vital motion of the craft i.e. roll, pitch, yaw are controlled by thrust vectoring exploitation servo motors and dynamical the magnitude of thrust using physics speed controllers. The paper deals with the look of a basic UAV supported application and therefore the construction keeping in mind the various ideas that govern its motion.

Keyword : - *VTOL, UAV*

1.INTRODUCTION

1.1. Unmanned Aerial Vehicles

Unmanned Aerial Vehicles (UAV) are unmanned flying aircrafts. They are completely different from the industrial aircrafts associate degreed jets in a very method that it doesn't have an on board pilot. Generally the pilot in a very UAV controls the motion from the bottom through a far off. Advanced development within the field has resulted in autonomous UAVs and therefore the would like of a pilot is eliminated. Such UAVs have an on-board controller that takes care of the stability and the trajectory motion of the UAV. Applications are often focused on the military areas, surveillance, inspection of transmission lines and power distribution; low cost filming and panoramic picturing for the movie industry, sport events, crop and herd monitoring, among others.

Over the past years several teams have worked on the event of UAV. The book Unmanned Aerial Vehicles by Randal and Beard [7] and Rogelio Lozana [8] give a very extensive explanation about the different types of UAVs and its modelling. The work done on quad rotors [1 2] gives a good idea on the design and stability of the four rotor system. [3 4] provides a sensible plan concerning the system and model of a quad rotor UAV. The model of a twinrotor can be related to this work.

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Optimization of Boiler Operation using Air Pre-Heater

M. Rama Krishnan[1], S. Subash[2], S. Manikandan[3], D. R. P. Rajarathinam[4]
[1, 2]*Final year B.E (Mechatronics), Paavai Engineering College (Autonomous)*
[3]*Assistant professor, Paavai Engineering College (Autonomous)*
[4]*Head of the department, Department of Mechatronics, Paavai Engineering College (Autonomous)*

Abstract: ***Air pre-radiator and economizer are heat move surfaces in which air temperature and water temperature are raised by exchanging heat from other media, for example, vent gas. Tourist is important for fast burning in the heater and furthermore to dry coal in processing plants. So a basic kettle frill which fills this need is air pre-radiator. The air pre-warmer isn't fundamental for task of steam generator, however they are utilized where an investigation of expense demonstrates that cash can be spared or productive burning can be acquired by their utilization. The choice for its selection can be made when the money related favorable circumstances is weighed against the capital expense of radiator. The productivity of the kettle increments with the expansion in the temperature of the ignition air utilized in the heater. This is accomplished by the expanded temperature of the pipe gas noticeable all around preheater and economizer zone. This paper manages the diverse approaches to get the most extreme warmth from the vent gas voyaging through the air preheater and the economizer zone to enhance the evaporator effectiveness.***

Keywords: Air Preheater, Heat Exchangers, Economizer, Seal Leakages, Heat Conductivity, Flue Gas, Optimum Air.

I. INTRODUCTION

Air is an essential segment in heaters and boilers. In every one of these types of gear, the surrounding air should be warmed up to high temperatures. Preheating the approaching air to a great extent enhances the warm proficiency of the framework, in this way expanding the vitality funds of the business and results in lower working expenses. Truth be told, each 220C ascent in ignition air temperature builds the evaporator proficiency by about 1%. Warmth exchangers can be utilized to recoup the warmth from different procedures to preheat the air. In any case, the warmth exchange coefficient of air is low and thus, blades or broadened surfaces are utilized to upgrade the warmth exchange [1]. It is a typical mechanical practice to use the warmth of fumes gases or vent gases and procedure steam to preheat surrounding air. Air pre-warmer is the most normal gear in charge of weakening in kettle proficiency and increment in assistant power utilization in ID (Induced draft), FD (Forced draft), and PA (Primary air) fans. In this paper distinctive parts of air pre-warmer execution has been talked about, for example, the parameters to be checked, circumstances and end results of poor execution of the air pre-warmer and how the air pre-radiator execution influences the kettle productivity. A few proposals to enhance the air pre-warmer execution are additionally talked about in this paper

A. Specification Of Air Preheater

Type: 27-VI-72 (T) 74
Where, 27 is the ostensible breadth of rotor in feet
VI represents vertically raised downstream air pre-radiator
72 is the stature of rotor in inches
74 is the stature of packaging in inches
This air preheater is separated into 3 parts of 72, 108 and 180 degrees. Pipe gas is permitted to pass start to finish vertically through the 180 degree part. Essential air is permitted to go from base to top upward through the 72 degree part and comparatively optional air passes upwardly through 108 degree part. The rotor is separated into 12 parts by vertical stomach plates. Warming components are orchestrated in these segments in 3 layers, the best layer hot end, middle and the base layer-cold end. Warming components at hot end and transitional end are indistinguishable. The best and base sides of the stomach plates are mounted with 12 sets of outspread seals each and the vertical sides of the rotor are mounted with 12 sets of pivotal seals.

B. Seal Spillages

Seals are given at the two finishes of the air preheater to limit spillage between the air sides what's more, the gas side of the pre radiator. The seal plates are comprised of uncommon erosion safe composite known as Corte steel. Essential and auxiliary air escape

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DESIGN AND FABRICATION OF AUTOMATIC ANIMAL IDENTIFIER AND RESTRICTOR TO PREVENT HUMAN LIVEHOOD

Rajarathnam.DRP[1], Sumithra.C[2] , Lakshmanakumar.M[3], Sakthivel.P[4], Keerthivasan.K[5]

[1] *Associate professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[2] *Assistant Professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[3] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[4] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[5] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*

ABSTRACT

The main aim of our project is to safeguard the crops from harm caused by animal on slope areas yet by divert the animal. Animal sightation system is intended to detect the presence of animal and provide a warning , during this project we tend to used PIR sensors to sight the movement of the animal and send signal to the controller .It diverts the animal by manufacturing sound signal in additional, this signal is transmitted to GSM associate which provides an response to farmers and forest department straightaway.

Keyword : - *PIC 16F877A, PIR sensor, GSM modem, APR board.*

1. INTRODUCTION

Due to over population it happens a deforestation this leads to shortage of food, water and shelter in forest areas. So, Animals interference in residential areas is increasing day by day that affects human life and property causes human animal conflict, however as per nature rule each living creature on this earth has necessary role in eco-system. Agriculture is that the backbone of the economy however due to animal interference in agricultural lands, there'll be immense loss of crops. Elephants and different animals coming back in to contact with humans, impact negatively in varied means that like by depredation of crops, damaging grain stores, water provides, homes and different assets, injuring and death of humans. Farmers in India face serious threats from pests, natural calamities &damage by animals leading to lower yields ancient ways followed by farmers aren't that effective and it's not possible to rent guards to stay a watch on crops and stop wild animals. Since safety of each human and animal is equally important. So, animal detection system is important in farm areas.

2. LITERATURE SURVEY

As per Navya Amin, in his paper of Obstacles distance measurement using ultrasonic sensor , he developed a module which is useful to avoid collision between two parts [1]. As per Anca Discant, in his paper of Sensors for obstacles detection, he developed a sensor used to identity the obstacles by the combination of active passive sensors [2]. As per Artur Frankiewicz, in his paper of Smart passive infrared sensors, he developed a passive infrared sensors which is used for the motion detection and recognition [3]. As per Baharuddin Mustapha, in his

A Project of Cleaning Smog and Particulates by Using Smog Cleaner with Negative-Ion Generator

R. Jagan[1], R. GokulaKrishnan[2], S. Ramar[3], S. Manikandan[4], D.R.P. Rajarathnam[5]

[1,2,3]*Student, Department of Mechatronics, Paavai Engineering College (Autonomous),Tamil Nadu, India.*

[4] *Assistant professor, Department of Mechatronics, Paavai Engineering College (Autonomous), Tamil Nadu, India.*

[5] *Professor, Department of Mechatronics, Paavai Engineering College (Autonomous), Tamil Nadu, India.*

ABSTRACT

The main objective of this project is to clean smog from the environment by cleaning micro-level dust particles. Smog is a mixture of smoke and fog, it contains a mixture of air pollutants and fog with suspended dust particles, it causes major health problems and reduces visibility. The smog was cleaned in special process by using negative ion generator, the negative ions which are generated by Air-ionizer are negative charged particles that are highly attracted to dust particles, it makes particulates into clusters hence it can be easily captures by filter which is fitted at the outlet. Basically fog is a high dense air with suspended water droplets, the density of fog is reduced by heating the intake fog by heating element and this heating element temperature is controlled by digital temperature controller thermostat which is programmed as per our convenience. We use timer for controlling intake and exhaust fans motor controls for optimization.

Keywords –*Heating coil, Negative-ion generator, Thermostat, Timer.*

1. INTRODUCTION

The mixture of smoke and fog causes smog, it causes major health problems. The air pollutant is major reason for smog formation, it includes particulates, sulphur dioxide, nitrogen oxides and other gases. This gas combines with ozone and particulates with the presence of sunlight to form smog, this is due to photochemical reactions of sunlight with these gases. According to National air quality Index in India permissible level of Particulate Matter ($PM_{2.5}$) is 31µg/m^3, but current level of $PM_{2.5}$ (particles lesser then 2.5 micrometre in diameter) exceeds more than 60µg/m^3 based on November 2009 air standard reports. The particulate matter can dame stones and infrastructures, it can damage forest and crops it widely affects agricultural crops and reduce yield. Major respiratory health problems are caused by these air suspended particles. This project was made for cleaning particulates presence in the atmosphere and smog, exposure on smog may affects human health. Most of the countries like India, China, United Kingdom, United States, United Arab Emirates and many other countries facing struggles of smog if particulate matter was removed smog it will adversely reduce smog occurrence on metro cities and atmosphere. China alone can spend nearly 44 billion dollars for clean energy projects.

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Optimization of Boiler Operation using Air Pre-Heater

M. Rama Krishnan[1], S. Subash[2], S. Manikandan[3], D. R. P. Rajarathinam[4]
[1, 2]*Final year B.E (Mechatronics), Paavai Engineering College (Autonomous)*
[3]*Assistant professor, Paavai Engineering College (Autonomous)*
[4]*Head of the department, Department of Mechatronics, Paavai Engineering College (Autonomous)*

Abstract: ***Air pre-radiator and economizer are heat move surfaces in which air temperature and water temperature are raised by exchanging heat from other media, for example, vent gas. Tourist is important for fast burning in the heater and furthermore to dry coal in processing plants. So a basic kettle frill which fills this need is air pre-radiator. The air pre-warmer isn't fundamental for task of steam generator, however they are utilized where an investigation of expense demonstrates that cash can be spared or productive burning can be acquired by their utilization. The choice for its selection can be made when the money related favorable circumstances is weighed against the capital expense of radiator. The productivity of the kettle increments with the expansion in the temperature of the ignition air utilized in the heater. This is accomplished by the expanded temperature of the pipe gas noticeable all around preheater and economizer zone. This paper manages the diverse approaches to get the most extreme warmth from the vent gas voyaging through the air preheater and the economizer zone to enhance the evaporator effectiveness.***

Keywords: Air Preheater, Heat Exchangers, Economizer, Seal Leakages, Heat Conductivity, Flue Gas, Optimum Air.

I. INTRODUCTION

Air is an essential segment in heaters and boilers. In every one of these types of gear, the surrounding air should be warmed up to high temperatures. Preheating the approaching air to a great extent enhances the warm proficiency of the framework, in this way expanding the vitality funds of the business and results in lower working expenses. Truth be told, each 220C ascent in ignition air temperature builds the evaporator proficiency by about 1%. Warmth exchangers can be utilized to recoup the warmth from different procedures to preheat the air. In any case, the warmth exchange coefficient of air is low and thus, blades or broadened surfaces are utilized to upgrade the warmth exchange [1]. It is a typical mechanical practice to use the warmth of fumes gases or vent gases and procedure steam to preheat surrounding air. Air pre-warmer is the most normal gear in charge of weakening in kettle proficiency and increment in assistant power utilization in ID (Induced draft), FD (Forced draft), and PA (Primary air) fans. In this paper distinctive parts of air pre-warmer execution has been talked about, for example, the parameters to be checked, circumstances and end results of poor execution of the air pre-warmer and how the air pre-radiator execution influences the kettle productivity. A few proposals to enhance the air pre-warmer execution are additionally talked about in this paper

A. Specification Of Air Preheater

Type: 27-VI-72 (T) 74
Where, 27 is the ostensible breadth of rotor in feet
VI represents vertically raised downstream air pre-radiator
72 is the stature of rotor in inches
74 is the stature of packaging in inches
This air preheater is separated into 3 parts of 72, 108 and 180 degrees. Pipe gas is permitted to pass start to finish vertically through the 180 degree part. Essential air is permitted to go from base to top upward through the 72 degree part and comparatively optional air passes upwardly through 108 degree part. The rotor is separated into 12 parts by vertical stomach plates. Warming components are orchestrated in these segments in 3 layers, the best layer hot end, middle and the base layer-cold end. Warming components at hot end and transitional end are indistinguishable. The best and base sides of the stomach plates are mounted with 12 sets of outspread seals each and the vertical sides of the rotor are mounted with 12 sets of pivotal seals.

B. Seal Spillages

Seals are given at the two finishes of the air preheater to limit spillage between the air sides what's more, the gas side of the pre radiator. The seal plates are comprised of uncommon erosion safe composite known as Corte steel. Essential and auxiliary air escape

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AUTOMATIC RAIN SENSING WIPER AND HEADLIGHT CONTROL IN THE VEHICLE

Rajarathnam.DRP[1], Vibinstalin.C[2] , Dinesh.S[3], Vijaya Kumar.A[4], Vijay.P[5],Venkatesan.K[6]

[1] *Associate professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[2] *Assistant Professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[3] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[4] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[5] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[6] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*

ABSTRACT

Wiper is an essential component that used to wipe raindrops or any water from the vehicle's windscreen and Head light is used to safety purpose during night. The previous system used to activate the wiper manually and the process of pulling up the wiper is difficult to be handled and now a days the headlight also glows in a day time. This day time AHO reduce the vehicle mileage. Thus, this method is planned to unravel these issues. The objectives of this project are to upgrade the older cars system by providing automatic wiping and headlight system , to improve the system by using sensor with actuator and to style a basic program that may totally operate with the system. The thought of this planned wiper system is comparable with alternative existing standard wiper. In spite of removing water from windscreen, this system also will be upgraded to an automatic control system by using a arduino UNO, rain detecting and intensity sensor, fog sensor and day night sensor.

Keyword : - *Rain sensor, Arduino uno, LDR, Head light, wiper motor*

1. INTRODUCTION

All the four wheelers area unit equipped with the wipers. These wipers are used to wipe the water on the windshield during rainy seasons so as to obtain clear vision. The wipers invented previously used to oscillate at a slow speed. Sometimes this cause the distraction to the driver's visibility. This diode to the invention of various speed wiper motors. The previous system accustomed activate the wiper manually and also the method of propulsion up the wiper is tough to be handled.To provide tension free driving, automatic wipers were enforced.Now a day the headlight also glows in a day time.

This day time AHO reduce the vehicle mileage. During night driving tons of glare is intimate by the motive force of the vehicle. He may sometimes face the Toxler Effect and this may lead to accident.The objectives of this project are to upgrade the older cars system by providing automatic wiping and headlight system. This project which will provide ease of operation and look after the human comfort.

2.HARDWARE DESCRIPTION

2.1 Arduino Uno

The Arduino UNO could be a wide used ASCII text file microcontroller board supported the ATmeg328Pmicrocontroller and developed by Arduino.cc the board is provided with sets of digital and analog

BIOMETRIC FINGERPRINT BASED SELF-AUTHENTIFICATION PROTECTED VOTING MACHINE

D.R.P.Rajarathinam[1], C.Vibinstalin[2] , Gnana sekar N[3],Ramesh M[4]

[1]*professor, Dept.of Mechatronics,Paavai Engineering College, Namakkal*

[2]*Assistant Professor,Dept.Of Mechatronics Engineering College, Namakkal*

[3,4]*UG student, Dept.of Mechatronics, Paavai Engineering College,Namakkal*

Abstract

Fingerprint Voting System was implemented with the Arduino technology. In this System a voter can poll his vote easily. In this database server all voters fingerprint information was stored to register in this system, the voter should scan the fingerprint during the poll time. This fingerprint information will be checked by the database server. Because all the fingerprint information about the voter would be already exist in the database, there is anything wrong, the system will not allow the voter to poll his or her vote. This system is helpful to avoiding the misuse of others vote. It is more Secured way. Fingerprint is an important identity of the user. Fingerprint Voting System is user-friendly. It has simple architecture, responses very quickly manner, Easy to carrying to polling center from the polling box, It provide easy and accurate counting without any troubles.

Keywords:- *Fingerprint sensor, arduino uno, LCD display, Indicators*

1.INTRODUCTION

Elections were a defining feature of democratic government, an electoral system is the set of rules that determines how elections and referendums were conducted and how their results were determined. Political electoral systems were organized by governments, while non-political elections may take place in business, non-profit organizations and informal organizations. There were so many electoral systems in world. That was paper ballots, punch cards and Optical Mark Sense Ballots. Some electoral systems elect a single winner to a unique position, such as prime minister, president or governor, while others elect multiple winners, such as members of parliament or boards of directors. The fingerprint voting system is an electronic voting machine using human biometric system. It's reducing the staff and polling time from paper voting system. In all the country votes were decided the feature. For that, we were introducing the new method of voting system to increase the standard of living.

According to the current system, votes could be counted manually so that there is more opportunity for occurring error, such as duplicates counting and completely missed counting Sometimes votes were even manipulated and motivate by political parties which lead to inaccurate vote and it will distort the results of an election in favour of certain candidates. This device can be useful for easy to handle, reliability and accurate. Vote counting is one of the vital activities in the election process. Failure to complete the count could lead to impact on people attitude towards the current government so that the election counting should be transparent, accurate and reliable then only public will feel confidence in the elections each polling station has a list of all voters assigned to the station and only those listed may vote in that Polling station.

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Design and Fabrication of lawn mower using RF module

A. Roshan zamir[1], M. Arun kumar[2], M. Subash[3], Prof. C. Vibin stalin[4]

[1,2,3]Students, Department of Mechatronis Engineering, Paavai Engineering College(Autonomous), Pachal Namakkal, India-637018

[4]Assistant Professor, Department of Mechatronics Engineering, Paavai Engineering College(Autonomous), Pachal Namakkal, Tamil Nadu, India-637018

Abstract - *The present technology ordinarily used for trimming the grass is by exploitation the manually handle device. In this paper we have automated the machine for trimming the grass. The device consists of linear blade that is operated with the assistance of the motor the facility offer for the motor is by exploitation battery. This project is associate degree autonomous garden tool which will enable the user to the flexibility to chop their grass with lowest effort. Unlike different robotic field mowers on the market, this design requires no perimeter wires to maintain the robot within the lawn. The project summarizes and reviews different technological development for making efficient and cost effective lawn mowers. The lawnmower is a machine to make cutting grass process easier. The lawnmower movement will be controlled using RF module.*

***Key Words*: Battery, Motor, Rf module, Blades, connecting wires.**

1. INTRODUCTION

The aim of paper is to reduce human accidents and air pollution by independent of fossil fuels. The project is developed to automatically operate without any human need saving labour power and time now a days the scope of lawn mower plays the vital role in every aspects such as industries, colleges, homes etc.., to make more creative and attractive they tend to plant grass in and around the infrastructure. Here the lawn mower is used for shaping and trimming as per the need. With the assistance of a lawn tool that could be a machine with revolving blades to assist USA cutting lawns at even length, individuals will simply maintain and beautify their lawns and gardens without any hassle. In previous days they use motor powered push lawn mower for trimming the grass which resulted in human accidents, create noise pollution due to loud engine and local air pollution due to the combustion in the engine. Due to technology development large size, and manually operated vehicles are reduced in their size and automated without reducing its efficiency and working performance. Fully Automated Grass Cutting device is a device which cuts the grass on its own. This device reduces both environmental and noise pollution. It is made with help of grass cutter, DC motors, motor driver, RF module, robotic body.

2. EXISTING SYSTEM

The star grass cutter has panels mounted AN exceedingly| in a very arrangement at an angle in such the way that it will receive radiation with high intensity simply from the sun. These star panels convert solar power into power. This machine consists of the photovoltaic, dc to dc converter, motor, controller, linear blades, and battery. It is an automatic system for the aim of grass cutting. Solar Grass Cutter uses solar power as an energy source that addresses a number of issues that standard internal combustion engine mowers do not. An electric grass cutter with a star charger are easier to use. There is no mussy, dangerous hydrocarbon to take care of, most significantly it eliminates the emissions of an indoor combustion lawn mower. An Arduino Uno control board will act as a processing unit and direct the entire working of the mower as per a presented programmer. The motion of the mower is controlled by four DC motors of 200 rpm. A height adjustment rack and pinion mechanism has been incorporated to the cutter motor to enable different heights of cutting. A Solar panel will charge the battery and eventually power six motors, four of which are for motion of the mower and the other two are of the cutter blade and height adjustment mechanism of the cutter. IR Sensors are used to detect and avoid obstacles.

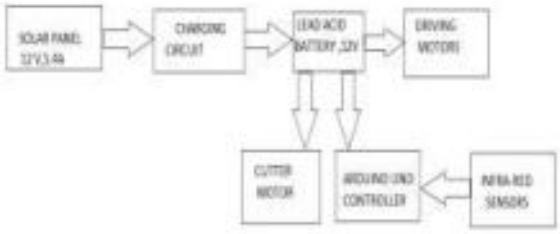

Fig-1: Block Diagram of Existing Mower

3. METHODLOGY

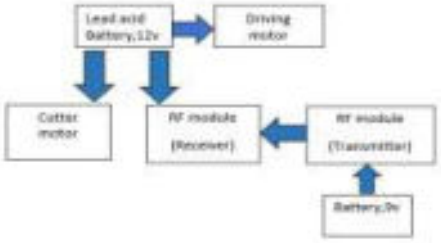

Fig-2: Block Diagram

MOBILE CONTROLLED PICK AND PLACE ROBOT USING ARDUINO

D.R.P.Rajarathinam[1],R.Arunbabu[2],M.Danujan[3],B.Jasper Fernando[4],
S.Vinoth Kumar[5],T.Sethupathi[6]

[1]*Professor,Department of Mechatronics,Paavai Engineering College,Namakkal,India*
[2]*Asst,professor,Department of Mechatronics,Paavai Engineering College,Namakkal,India*
[3]*Student,Department of Mechatronics,Paavai Engineering College,Namakkal,India*
[4]*Student,Department of Mechatronics,Paavai Engineering College,Namakkal,India*
[5]*Student,Department of Mechatronics,Paavai Engineering College,Namakkal,India*
[6]*Student,Department of Mechatronics,Paavai Engineering College,Namakkal,India*

ABSTRACT

The work is designed to develop the pick and place robotic arm with a soft catching gripper that to lift hazardous object which cannot not be touched by human hands.The robot is controlled through Bluetooth using smartphone.It is built with servo motors. Arduino *controller is used in robotic arm process ,the movement of the robot is either forward,backward,left or right.The robotic arm is designed using servo motors,and it is interfaced with micro controller.The main advantage of soft catching gripper is to lift a hazardous object.it is controlled by using Bluetooth in smart phone.*

Keyword—*Arduinouno,Bluetooth,servmotor*

1. INTRODUCTION

The project aims in designing a Robot arm which is operated using bluetooth and also which is capable of Picking and Placing of many objects.The advent of latest high-speed technology and therefore the growing bluetooth capability provided realistic chance for brand spanking new automaton managements and realization of latest ways of control theory.This technical improvement at the side of the requirement for top performance robots created quicker, more accurate and more intelligent robots using new robots control devices, new drivers and advanced control algorithms.This project describes a brand new economical resolution of automaton management systems.The bestowed automaton arm system are often used for various refined robotic applications.The modules in the project are: Bluetooth interfaced to Microcontroller, Robot arm which is capable of Picking and placing objects, Servo motors is attached to the robot arm for themovement of mechanism andMicrocontroller that performsthe dominant operations of mechanism arm in choosing and putting of objects.The controlling device of the whole system is a Microcontroller to which bluetooth; Servo motors of robot arm are interfaced through a motor driver. Whenever the appropriate keys on mobile application then the data will betransmitted through bluetooth to the microcontroller.The Microcontrollerchecks the data with the program embedded in it and performs appropria te actions onthe robot arm. The Microcontroller is programmedusingClanguage.An embedded system may be a combination of software package and hardware to perform a zealous task.Some of the most devices employed in embedded product square Measure Microprocessors and Microcontrollers. Microprocessors square measure remarked as generalpurpose processors as they merely settle for the inputs, process it and give the output.In contrast, a microcontrollernotonlyaccepts the dataas inputs however additionally manipulates it, interfaces the information with numerous devices, controls the information and therefore finally offers the result.The “Bluetooth controlled pick and place robot” using Arduino microcontroller is an exclusive project which is used to control speed and direction of Servo motor using general purpose bluetooth unremarkably.

DESIGN AND FABRICATION OF SURVEILLANCE DRONE IN CAVES

Rajarathnam.DRP[1], Arunbabu.R[2] , Suresh Kumar.M[3], Dineshwaran.S[4], Dhilip.A[5], NandhaKumar.S[6]

[1] *Associate professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[2] *Assistant Professor, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[3] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[4] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[5] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*
[6] *Student, Mechatronics Department, Paavai Engineering College , Tamilnadu , India*

ABSTRACT

There are several advancements within the field of region and aeronautics. Scientists have more and more began to concentrate on VTOL (vertical take - off and landing) aircrafts. we've got engineered a miniature VTOL twinrotor UAV. UAVs have begun to grab plenty of attention nowadays because of its various applications like police work and relief. Twinrotor may be a quite a eggbeater having 2 main propellers rather than one and no tail fin. All 3 vital motion of the craft i.e. roll, pitch, yaw are controlled by thrust vectoring exploitation servo motors and dynamical the magnitude of thrust using physics speed controllers. The paper deals with the look of a basic UAV supported application and therefore the construction keeping in mind the various ideas that govern its motion.

Keyword : - *VTOL, UAV*

1.INTRODUCTION

1.1. Unmanned Aerial Vehicles

Unmanned Aerial Vehicles (UAV) are unmanned flying aircrafts. They are completely different from the industrial aircrafts associate degreed jets in a very method that it doesn't have an on board pilot. Generally the pilot in a very UAV controls the motion from the bottom through a far off. Advanced development within the field has resulted in autonomous UAVs and therefore the would like of a pilot is eliminated. Such UAVs have an on-board controller that takes care of the stability and the trajectory motion of the UAV. Applications are often focused on the military areas, surveillance, inspection of transmission lines and power distribution; low cost filming and panoramic picturing for the movie industry, sport events, crop and herd monitoring, among others.

Over the past years several teams have worked on the event of UAV. The book Unmanned Aerial Vehicles by Randal and Beard [7] and Rogelio Lozana [8] give a very extensive explanation about the different types of UAVs and its modelling. The work done on quad rotors [1 2] gives a good idea on the design and stability of the four rotor system. [3 4] provides a sensible plan concerning the system and model of a quad rotor UAV. The model of a twinrotor can be related to this work.

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PCB MANUFACTURING MACHINE USING HYBRID DNC MACHINE

RAJARANATHNAM D.R.P.[1] ,R.T.AJAYKARTHIK[2],ARUNKUMAR.G[3], GOWSIC RAJ.T[4]

Associate professor, Mechatronics Department, Paavai Engineering College, Tamilnadu, India

Associate professor, Mechatronics Department, Paavai Engineering College, Tamilnadu, India
Student, Mechatronics Department, Pavaai Engineering College, Tamilnadu, India
Student, Mechatronics Department, Pavaai Engineering College, Tamilnadu, India

ABSTRACT

Normally, for making PCB, we required more time for designing, printing etching also drilling. Hence to reduce time and more effort we are design this project. In this paper, the design of PCB milling and drilling machine, where the drill holes and circuit path are automatically find out the layout in EAGLE software. This paper focuses on the design and fabrication of automatic PCB milling and drilling machine for large production. This is the microcontroller based machine that uses path planning through the numerical codes for the circuit layout. In this project, multiple spindle or fixtures are controlled by single control unit, which is used to make the system more stable and accurate for high productivity.

Keyword: *Hybrid DNC, PCB Milling, Multiple Spindles, Common drive system.*

1. INTRODUCTION

The goal of this project is to design and implement a computer controlled PCB drilling machine. All the mechanical and electronics design are done from scratch to realize the project. There is also a computer program which communicates with the machine Electronics. Next chapter reveals the main blocks of the designed project. It gives introductory information about the whole system. Following chapters explain the main blocks of the system seperately in detail. The conclusions chapter includes the results of the project and future decisions. References are also added at the end of the project report. Finally, appendices list the source codes and circuit diagrams that are used in this project.

2.SYSTEM OVERVIEW

In electronics industry, Printed Circuit Boards (PCB) are designed using Computer Aided Design (CAD) progra ms. These programs generate a standardized file which is known as Excellon Drill File . Excellon files define t he position of hole locations on the designed PCB. This information is used in Computer Numerical Control (CNC) machines to drill the necessary holes on the PCB. In this project, the developed software takes the Excellon drill file of the PCB. Than it calculates the necessary parameters and sends the coordinate information to PIC16F877 m icrocontrollerunit(MCU)overs232 line. When MCU takes the necessary information, it immediately indexes th e stepper motor drivers. Stepper motor drivers turn the stepper motors according to the index pulses applie d to them. Stepper motors move the mechanism to accomplish the drilling of the PCBs

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PRIVATE CLOUD STORAGE SYSTEM

C.Natarajan,
Final Year B.Tech(IT),
Department of Information Technology,
Paavai Engineering College, Namakkal, Tamil Nadu.

B.Venkatesan,
Associate Professor,
Department of Information Technology,
Paavai Engineering College,Namakkal,Tamil Nadu.

S.Rajesh,
Associate Professor,
Department Of Computer Science,
Paavai Engineering college,Namakkal.,Tamil Nadu.

Abstract: Cloud storage is a model of computer data storage in which the digital data is stored in logical pools. Cloud storage services can be accessed through OWNCLOUD API (Application Program Interface) . OWNCLOUD is a suite of client–server software for creating and using file hosting services. OWNCLOUD is free and open-source, and thereby allowing anyone to install and operate it without charge on a private server.

Keyword: Linux Operating System (UBUNTU 18.04). OWNCLOUD API.Ngrok (Port Forwarding).

I.INTRODUCTION:

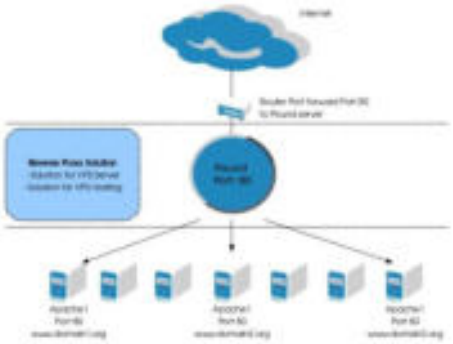
In our project we are going to develop our own Private Cloud Storage using Linux server. Our private cloud adoption will help us to reduce costs in many areas. An important objective is reduction of operational costs, which we can achieve by choosing a low-maintenance platform. Because of the usage of linux server the security is high.

II.OUR INOVATION

The development of private cloud storage is cost efficient and it is fully based on an open source components. Here no need to develop a specific server for a cloud. Because linux operating system contains inbuilt web server in it (Apache server). Regular maintenance of a server is not required. Port forwarding are enabled without any cost.

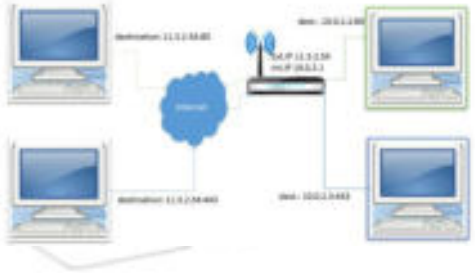
III.DEVELOPMENT PROCESS

Linux is a family of free and open-source software operating systems based on the Linux kernel. Ubuntu is a free and open-source Linux distribution based operating system. A Linux server is a high-powered variant of the Linux open source operating system that's designed to handle the more demanding needs of business applications such as network and system administration, database management and Web services.



IV. PORT FORWARDING

In computer networking, **port forwarding** or **port** mapping is an application of network address translation (NAT) that redirects a communication request from one address and **port**number combination to another while the packets are traversing a network gateway, such as a router or firewall.



V. OWN CLOUD AND NGROK

OWNCLOUD is a suite of client–server software for creating and using file hosting services. Ngrok is a multiplatform tunnelling, reverse proxy software that establishes secure tunnels from a public endpoint such as internet to a locally running network service.

VI. LINUX OS IN OWN CLOUD API

- Ubuntu. If you've researched Linux on the internet, it's highly probable that you have come across Ubuntu.
- Linux Mint Cinnamon. For years, Linux Mint has been the number one Linux distribution on Distrowatch.

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IoT based Fighter Robots for Military Applications

Mr.B.Venkatesan, A.Naveen, R.Dilip Nagaraj, S.Sakthivel
Paavai Engineering College

Abstract

The principle objective behind building up this robot is for the observation of human exercises in the war field or outskirts with the goal to lessen the penetrations from the adversary side. The robot comprises of remote camera which can transmit recordings of the war field with the goal to keep any harm and misfortune to human life. Military individuals have a gigantic hazard on their lives while entering an obscure domain. The robot will fill in as a suitable machine for the resistance segment to diminish the loss of human life and will anticipate unlawful exercises. It will enable the military to safeguard the individuals by knowing the state of domain even before entering it.

Index Terms - *Architecture of Robotics,Power Supply, PCB Fabrication, NodeMCU, L293D Motor, DC Motor,IoT.*

I.INTRODUCTION

IoT is the connection of everyday objects in the physical world to the Internet. It is fast emerging as the sustainable solution for providing access to clean and affordable energy all around the world. IoT imparts intelligence to the current devices and equipment using sensors and software that are networked together through the Internet. It provides cyber secured intelligent energy management system to meet demand response management requirements. Literally every physical entity on earth, like appliances, goods, objects, machines, buildings, vehicles, plants, animals and even us humans, will be the things in the IoT. The objective of this paper is to point out some of the challenges associated with IoT and to list the recommended solutions to these challenges.

A rescue robot is a kind of surveillance robot that hasbeen designed for the purpose of rescuing people. Commonsituations that employ rescue robots are mining accidents,urban disasters, hostage situations, and explosions. Militaryrobots are autonomous robots or remote-controlled devicesdesigned for military applications. Such systems are currentlybeing researched by a number of militaries. USMechatronicshas produced a working automated sentry gun and is currentlydeveloping it further for commercial and military usethat can be operated remotely. Dealing with varied terrain places extra demands onthe mobile robot's propulsion system, among other systems.Power management and new generation drive-train systemsutilize advanced materials and highly efficient transmissionsto obtain higher speed, accuracy, and durability to work in awide range of environments. Enhanced power managementcomes through more advanced fuel cells and newly designedbattery and charging systems.Configuring a robot to ascend and descend obstacles inunstructured environments with ease is a design challengeand uses more power. The systemmust be able to overcomeboth regularly shaped obstacles such as stairs and those ofan unspecified shape such as rocks, downed trees, and othermiscellaneous objects. Engineers must consider the center ofgravity, torque requirements to ascend inclines, mass, andpayloads when designing mobile robotic systems formilitarypurposes. In military applications, wearable robotics helpssoldiers carry a heavy pack load.Arobot acts like a packmule,is fully autonomous, and carries a large amount of supplies.There aremanymicrocontrollers in themarket consistingof various types of capability from basic input output to highend microcontroller. These various types of microcontrollerare purpose-made for general application. In this research,wepropose architecture for Raspberry pi based robot that canbe controlled by neural network with the capabilities to avoidobstacles.

A. Working Principle

Prime controller for this robot is NodeMCU Board integrated with IoT. The operating voltage of this robot is 5V-9V and we are using the regulated DC 5V supply for the control circuit and for the motors DC 9V supply is given. And mechanical arrangement is provided for movement of the motor which is driven through motor driver circuit. This entire electromechanical arrangement is controlled through IoT interfaced android/desktop web application. The wireless camera helps for live streaming of video transmission with secured connection using cloud to an android mobile/PC. This robot is enabled with laser module to serve as defense mechanism, this is will help the soldier to kill the enemy if there is a situation.

IOT Based Smart Cart with Automatic Billing for Futuristic Shopping Experience

S.Saravanakumar, M.Tech.,(Ph.D), Ravichandran.K, Jeshwanthraj.R
Paavai Engineering College

Abstract

A creative item with societal acknowledgment is the one that guides the solace, accommodation and effectiveness in regular daily existence. Acquiring and shopping at enormous shopping centers is winding up day by day action in metro urban areas. We can see huge surge at these shopping centers on siestas and ends of the week. Individuals buy distinctive things and place them in trolley. After fruition of buys, one needs to go to charging counter for installments. At charging counter the clerk set up the bill utilizing standardized identification per user which is extremely tedious process and results in long line at charging counter. In this paper, we talk about a item "Smart Shopping Cart" being produced to help a man in regular shopping as far as diminished time spent while buying. The primary target of proposed framework is to give an innovation situated, minimal effort, effectively adaptable, and rough framework for helping shoppingfacetoface.

I.INTRODUCTION

In busy world, waiting in the long queue during shopping as become tedious process. And this consume the lot of time of the user in the shopping market. To avoid this problem, we are proposing a futuristic shopping system. This reduces the billing time of the user. And user no longer need to wait in the long queue for billing. This is system will replace conventional and time-consuming system. The proposed system used emerging technology like Internet of Things along with Android and RFID. User can experience prepaid shopping system, where user have to recharge the cart with amount of his/her requirement. And for every item that he/she includes in the shopping cart the amount will be automatically detected. Amount will be credited to user prepaid shopping account, if added item is taken out of the cart. Near Field Communication system (RFID) is used here, to uniquely identifies the each item in the super market and to know about other

details like price. Entire system is communicated via IoT.

II.WORKING

Prime controller for this robot is NodeMCU Board integrated with IoT. The operating voltage of this robot is 5V-9V and we are using the regulated DC 5V supply for the control circuit and for the motors DC 9V supply is given. And mechanical arrangement is provided for movement of the motor which is driven through motor driver circuit. This entire electromechanical arrangement is controlled through IoT interfaced android/desktop web application. The wireless camera helps for live streaming of video transmission with secured connection using cloud to an android mobile/PC. This robot is enabled with laser module to serve as defense mechanism, this is will help the soldier to kill the enemy if there is a situation.

Block diagram

ROBOT Section

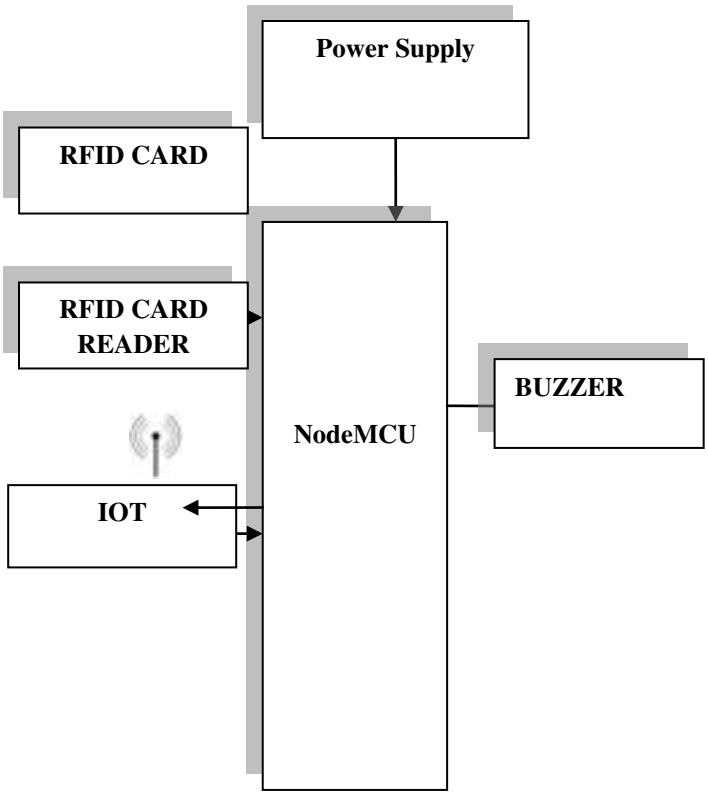

Fig 3.1 Robot Section

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ASSERTING THE SELF: DEPICTION OF WOMEN IN MAHESH DATTANI'S *BRAVELY FOUGHT THE QUEEN*

K.SHALINI

Assistant Professor of English, Paavai Engineering College, Namakkal, Tamil Nadu.

ABSTRACT

Mahesh Dattani, an elite, modern and a creative thinker has discovered the world of real human experience and given drama a synonym of life itself. *Bravely Fought the Queen,* an important play in the mile stone of Dattani's career, deals with the invisible issue about homosexuality and patriarchy in a family. He exposes the chauvinistic intrinsic in the modern Indian male, who takes women for granted to be an object in their life to provide physical enjoyment, social companionship and domestic comfort. Dattani strives to undo this distorted image of women. Through this play, he gives a new image of the Indian women who try to assert their individuality and seek to break the age old silence by refusing to be what their men want them to be. Hence, the women characters are not only victims but they fight back against the injustice and ill treatment. And thus, the paper attempts to speak about Dattani's persistent effort in relocating the position of women in the patriarchal order.

Key words: invisible issues, women, victims, individuality, identity.

Mahesh Dattani has explored the world of real human experience. In spite of using myths and historical connotations, he has enriched the tradition of Indian theatre with the diversified Indian cultural sensibility and his own native experience. *Bravely Fought the Queen,* an important play in the mile stone of Dattani's career, deals with the invisible issue - homosexuality and patriarchy in a family. The play throws light upon certain ugly and harsh realities of the normal people, bringing a great shift in Indian values.

Dattani exposes the position of women in conventional society by handling homosexuality - an imperceptible issue that shifts the Indian values in this play. The play

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ORIGINAL PAPER

Some New Oscillatory Behavior of Certain Third-Order Nonlinear Neutral Differential Equations of Mixed Type

M. Sathish Kumar[1] · **S. Janaki**[2] · **V. Ganesan**[3]

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Abstract By applying Riccati substitution techniques triply, we establish some new oscillation and asymptotic nature of solutions to the third-order nonlinear differential equations with mixed neutral type. We present many theorems and related examples in order to illustrate and substantiate the main theory.

Keywords Third-order · Neutral differential equation · Oscillation of solutions · Mixed arguments

Mathematics Subject Classification 34K11 · 34C10 · 34C15

Introduction

In the present paper, we have focussed on the oscillation and asymptotic nature of third-order nonlinear differential equations with mixed neutral type

✉ M. Sathish Kumar
msksjv@gmail.com

S. Janaki
janakisms@gmail.com

V. Ganesan
ganesan_vgp@rediffmail.com

1 Department of Mathematics, Paavai Engineering College (Autonomous), Namakkal, Tamil Nadu 637018, India

2 Deputy Directorate of Statistics, Government of Tamil Nadu, Namakkal, Tamil Nadu 637003, India

3 Department of Mathematics, Aringar Anna Government Arts College, Namakkal, Tamil Nadu 637002, India

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OSCILLATION CRITERIA FOR FUNCTIONAL DIFFERENCE INEQUALITIES WITH STRONGLY BOUNDED FORCING TERM

PON SUNDAR[1*], B. KISHOKKUMAR[2] AND K. REVATHI[3]

[1]Om Muruga College of Arts and Science, Mettur, Salem - 636 303, Tamil Nadu, India.
[2]Department of Mathematics, Paavai Engineering College (Autonomous), Namakkal - 637 018, Tamil Nadu, India.
[3]Department of Mathematics, Sri Sarada Niketan College of Arts and Science, Salem - 636 354, Tamil Nadu, India.

AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between all authors. Author PS designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript and managed literature searches. Authors BK and KR managed the analyses of the study and literature searches. All authors read and approved the final manuscript.

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Original Research Article

ABSTRACT

In this paper, we consider the functional difference inequalities of the form

$$x(n)\left\{L_m x(n) + f\left(n, x(g_1(n))x(g_2(n))\cdots x(g_k(n))\right)\right\} - h(n) \leqq 0 \quad \text{for} \quad m \quad \text{even}$$

and

$$x(n)\left\{L_m x(n) - f\left(n, x(g_1(n))x(g_2(n))\cdots x(g_k(n))\right)\right\} \quad h(n) \geqq 0 \quad \text{for} \quad m \quad \text{odd}$$

where $m \geqq 2$ and L_m is the general disconjugate difference operator defined by $L_0 x(n) = a_0(n)x(n)$ and

$$L_i x(n) = a_i(n)\Delta(L_{i-1}(x(n))), \quad i = 1, 2, \cdots, m.$$

**Corresponding author: E-mail: mydt972009@gmail.com*

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Oscillation theorems for certain delay difference inequalities

Pon Sundar[1]*, B.Kishokkumar[2] and K. Revathi[3]

Abstract

Our aim in this paper is to give some new results on the oscillatory behavior of all solutions of the delay difference inequalities

$$x(n)\left[L_m x(n)+a(n)x(n)+(q(n)+p^j(n))x[n-m\tau]\right]\leq 0 \quad \text{for } m \text{ odd}$$

and

$$x(n)\left[L_m x(n)-a(n)x(n)-(q(n)+p^j(n))x[n-m\tau]\right]\geq 0 \quad \text{for } m \text{ even}$$

under the condition $\sum^{\infty}\frac{1}{a_i(s)}=\infty$, $i=1,2,\cdots,m-1$. Further the result can be extended to more general equations.

Keywords

Oscillation, Delay terms, Bounded solutions, Linear and Nonlinear, Difference inequalities.

AMS Subject Classification

39A10, 39A12.

[1] *Department of Mathematics, Om Muruga College of Arts and Science, Mettur, Salem - 636 303, Tamil Nadu, India.*
[2] *Department of Mathematics, Paavai Engineering College (Autonomous), Namakkal - 637 018, Tamil Nadu, India.*
[3] *Department of Mathematics, Sri Sarada Niketan College of Arts and Science, Salem - 636 354, Tamil Nadu, India.*
***Corresponding author**: [1] mydt972009@gmail.com; [2]bkishok@gmail.com; [3] revathisamy78@gmail.com
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2 **Main Results** 45
3 **Some Extensions** 47
References 48

1. Introduction

Recently there has an increasing interest in studying the oscillatory and asymptotic behavior of difference equations of various types, for examples see [2–9, 13, 15, 18, 19] Our main goal in this paper is to give first some new results on the oscillatory behavior of all solutions of the delay difference inequalities

$$x(n)\left\{L_m x(n)+a(n)x(n)+(q(n)+p^j(n))x[n-m\tau]\right\}\leq 0, \quad \text{for } m \text{ odd} \tag{1.1}$$

and

$$x(n)\left\{L_m x(n)-a(n)x(n)-(q(n)+p^j(n))x[n-m\tau]\right\}\geq 0, \quad \text{for } m \text{ even} \tag{1.2}$$

and then extent there results to equations of the form

$$L_m x(n)+(-1)^{m+1}\sum_{i=0}^{m} f_i(n,x[n-m\tau_i])=0, \tag{α}$$

and

$$L_m x(n)+(-1)^{m+1}\left[a(n)x(n)+f\left[n,x[n-m\tau_1],\cdots,x[n-m\tau_m]\right]\right]=0, \tag{β}$$

where

$$\begin{aligned} L_0 x(n) &= x(n) \\ L_k x(n) &= a_k(n)\Delta(L_{k-1}x(n)), \quad k=1,2,\cdots,m \end{aligned}$$

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High performance ethanol and acetone gas sensor based nanocrystalline $MnCo_2O_4$ using clad-modified fiber optic gas sensor

S. Vadivel[a,*], G. Balaji[b], S. Rathinavel[b]

[a] Department of Physics, Paavai Engineering College (Autonomous), Namakkal, 637 018, Tamilnadu, India
[b] Department of Electrical and Electronics Engineering, Paavai Engineering College (Autonomous), Namakkal, 637 018, Tamilnadu, India

ARTICLE INFO

Keywords:
$MnCo_2O_4$
Hydrothermal
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Fiber optic gas sensor
Ammonia gas
High sensitivity

ABSTRACT

Herein, we report a facile, low-cost and one-step hydrothermal approach for the synthesis of $MnCo_2O_4$ (MCO) nanoparticles without any post annealing treatment. The crystalline phase, the morphology, and the valences of the elements in the obtained samples were characterized by powder X-ray diffraction (PXRD), transmission electron microscopy (TEM), X-ray photoelectron spectrometry (XPS) and Energy dispersive spectra (EDS) analysis, respectively. XRD and TEM results suggest that as synthesized $MnCo_2O_4$ have spinel cubic structure with spherical shaped morphology. The Nitrogen adsorption–desorption analysis indicates that the BET surface area is calculated to be 65.3 m^2/g and the pore size distribution is mostly centered at 28 nm, which is in good agreement with the grain size calculated from XRD results. Gas sensing properties of nanocrystalline $MnCo_2O_4$ clad – modified fiber optic sensor is reported for ethanol and acetone gasses, at room temperature. The results showed that $MnCo_2O_4$ has high sensitivity to ethanol gas, fast response and recovery time than compared to acetone gas. The possible gas sensing mechanism is also proposed in detail.

1. Introduction

Recently, all around the globe on detecting and monitoring toxic and dangerous gases is mostly concentrated [1–5], because of the increasing release of hazardous gases, fluids and chemicals from industrial effluents, agricultural chemicals and fertilizers [6]. Gas sensors are in great demand for various household and industrial applications [7,8]. Thus, gas sensors with fast response, high sensitivity and selectivity are promising for exploration [9]. Resistive type metal-oxides sensors are mostly utilized for gas detecting applications yet their gas sensitivity is poor moderately at room temperature and group of research is going ahead to enhance the gas sensitivity, selectivity and stability [10–13]. Recently, fiber optic gas sensors using metal oxides are increasingly explored as they offer several advantages such as low cost, small size and high sensitivity [14]. Clad modified fiber optic based gas sensors using metal oxides as gas sensing medium is a well known room temperature based low cost efficient sensing technique. In this type of sensors cladding portion of the fiber is replaced by the prepared metal oxide and used for gas sensing. Gas interaction with modified clad by varying the intensity of the light propagating through the fiber core is the key principle in the sensing mechanism. In recent years, variety of porous metal oxides such as Co_3O_4, NiO, ZnO, SnO_2, etc. have been synthesized and analyzed for gas sensing because of its offer low cost, long-term stability, plausible cyclability and environmental-friendly, making them attractive metal oxide semiconductors have received enormous attention for gas sensing applications.

Among them, the transition metal oxides with a spinel structure have been paying attention in the broad area of research field owing to their unique properties such as magnetic, electrical and optical properties [15–17]. The common chemical formula of the spinel is AB_2O_4, where A and B are the divalent and trivalent metal ions, coordinated in tetrahedral and octahedral sites, respectively [18]. M. Manjula et al. [19] have prepared Ho-doped Bi_2O_3 nanoparticles and studied the gas sensing properties of ammonia, ethanol, methanol and acetone gases clad-modified fibre optic gas sensor. M. Subramanian et al. [20] have synthesized nanosized $Zn_3(VO_4)_2$ was synthesized by solution combustion method and studied the ammonia gas sensor using clad modified fiber optic method. M. Manjula et al. [21] have reported gas sensing properties of nanocrystalline bismuth oxide clad – modified fiber optic sensor is reported for ammonia, ethanol, methanol and acetone gasses at room temperature. Thus, $MnCo_2O_4$ has been acknowledged as an elective cathode material for the dangerous and vapor gas sensor because of its amazing conductivity and tunable structural properties. $MnCo_2O_4$ lies on the typical spinel family that comprises of Mn^{2+} particles in tetrahedral sites, Co^{3+} particles in the octahedral sites and O_2^- particles tend to facilitate the two positions to

* Corresponding author.
E-mail address: vadivel.physics@gmail.com (S. Vadivel).

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Development of ethanol and acetone gas sensing performance of $MgCo_2O_4$ nanosensors by clad modified fiber optical method

S. Rathinavel[a], S. Vadivel[b,*], G. Balaji[a]

[a] Department of Electrical and Electronics Engineering, Paavai Engineering College (Autonomous), Namakkal 637 018, Tamilnadu, India
[b] Department of Physics, Paavai Engineering College (Autonomous), Namakkal 637 018, Tamilnadu, India

ARTICLE INFO

Keywords:
$MgCo_2O_4$
Spinel-type oxides
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Fiber optic
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High sensitivity

ABSTRACT

We have successfully synthesized large scale magnesium cobalt oxide ($MgCo_2O_4$) nanosheets (NSs) was synthesized by a facile hydrothermal route. These $MgCo_2O_4$ NSs were characterized by X-ray diffractometry, N_2 adsorption Brunauer-Emmett-Teller method, scanning electron microscopy and transmission electron microscopy analysis. XRD and TEM results suggest that $MgCo_2O_4$ was cubic structure with nanosheets and sizes in the range of 200–250 nm diameter and 10–15 nm thickness. The N_2 adsorption–desorption analysis indicates that the BET surface area of $MgCo_2O_4$ nanoparticles is calculated to be 98.5 m^2/g and the pore size distribution is mostly centered at 30 nm. The $MgCo_2O_4$ sensor was exposed two type of reducing gases like ethanol and acetone and the results demonstrates that the sensor showed superior gas sensing performance such as high sensitivity (81×10^{-3} k/Pa), rapid response (15 s) and recovery time (19 s) towards ethanol gas. This could be due to large specific surface area with sufficient sensing active sites, more gas adsorption, and achieving the enhanced gas-sensing performance. The improved gas sensing mechanism of the proposed sensor is also discussed in detail.

1. Introduction

In afterward a long time, since of growing anxiety with respect to environmental security and safety, demands for area and monitoring of harmful and dangerous gasses have become the issue of concern inside the entire world. Ethanol, also called ethyl alcohol, pure alcohol, grain alcohol, or drinking alcohol, is a volatile, flammable, colorless liquid. Prolonged heavy consumption of alcohol can cause significant permanent damage to the brain and other organs. Moreover, the acetone was underestimated, mostly because there were not any suitable devices to detect it in exhaled breath and correlate it with specific diseases, such as diabetes. Thus, it is important to develop a high performance gas sensor that could be used in ethanol gas detection. Chemical gas sensors have found wide applications in industrial production, therapeutic diagnosis, natural observing, and air quality control [1,2]. Expanding necessities for accurate detection of hazardous, poisonous, and biomarker gasses have driven to growing intrigued in high-performance gas sensors [3,4]. Nowadays, fiber optic gas sensors based on metal-oxides as the detecting medium have been detailed for moving forward the gas sensing performance at room temperature operation [5]. These sensors are safe to electromagnetic impedances, are low cost and might be utilized in antagonistic situations. The intensity of the light passing through the fiber is remarkably sensitive to change within the refractive index of the cladding, which is influenced by the gas to be identified. This shapes the discovery guideline of the fiber optic gas sensor and is accomplished by evacuating a little portion of the cladding of the fiber and supplanting it with the metal oxide. Compared with the commercial sensors, metal-oxide semiconductor gas sensors have pulled in much consideration due to their advantageous highlights, such as huge sensitivity beneath surrounding conditions, low control utilization, and simplicity in manufacture. Semiconducting metal oxides such as ZnO, SnO_2 and Fe_2O_3 etc., have been widely studied as gas sensing materials [6–10]. Among these, Spinel type oxides with an equation of AB_2O_4 (A could be a divalent metal and B may be a trivalent one) have been detailed as a imperative complex oxide in field of gas sensors and have been examined for the location of oxidizing as well as reducing gasses [11].

Moreover, most of the literatures focus on $MgCo_2O_4$ as used to electrochemical investigations and its applications in batteries and supercapacitors [12–14]. To date, no report about $MgCo_2O_4$ based gas sensor literatures. Hence, we reported gas sensing investigations $MgCo_2O_4$ sensor using fiber optic clad modified method. Moreover, we developed significant morphology like nanosheets, which provide more active site on its surface, which is benefit the more absorption of gas molecules on the surface, enhancing the gas sensing performance. To the best of the author's knowledge, this is the first report about fiber

* Corresponding author.
E-mail address: vadivel.physics@gmail.com (S. Vadivel).

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Full length article

Fiber optic ethanol gas sensor based WO_3 and WO_3/gC_3N_4 nanocomposites by a novel microwave technique

S. Vijayakumar[a], S. Vadivel[b,*]

[a] Department of Electronics and Communication Engineering, Paavai Engineering College (Autonomous), Namakkal 637 018, Tamil Nadu, India
[b] Department of Physics, Paavai Engineering College (Autonomous), Namakkal 637 018, Tamil Nadu, India

HIGHLIGHTS

- $WO_3/g\text{-}C_3N_4$ composites were successfully synthesized by a one step microwave irradiation method.
- $WO_3/g\text{-}C_3N_4$ has high sensitivity, fast response and recovery time towards ethanol gas.
- The enhancement has been explained by surface O_2 and ethanol gas.
- $WO_3/g\text{-}C_3N_4$ would be promising potential application in gas sensor field.

ARTICLE INFO

Keywords:
WO_3
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High sensitivity

ABSTRACT

In this report, WO_3/graphitic carbon nitride ($g\text{-}C_3N_4$) composites were successfully prepared through one step microwave irradiation technique followed by direct calcining of a combination of WO_3 and $g\text{-}C_3N_4$ at 400 °C for 2 h. The nanocomposites were analyzed by X-ray diffraction (XRD), Transmission electron microscopy (TEM), Raman, X-ray photoelectron spectra and N_2-sorption analysis. Powder XRD results reveal that pure WO_3 could be well indexed as the monoclinic structure (JCPDF 43-1035) and the two characteristic peaks of $g\text{-}C_3N_4$ bulk appearing at 13.2° and 27.6° could be assigned to the (1 0 0) and (0 0 2) planes respectively. The XPS results verify that presence of $g\text{-}C_3N_4$ in WO_3 and tungsten in 6^+ states in WO_3 nanocrystals. TEM images showed that a serious agglomeration of nanoparticles (25–30 nm), which can be dispersed on the $g\text{-}C_3N_4$ nanosheets. The high surface area of $WO_3/g\text{-}C_3N_4$ (138 $m^2 \cdot g^{-1}$) and the interaction between 2-D $g\text{-}C_3N_4$ and WO_3 could strongly favour of the elevated gas-sensing property. Fiber optic gas sensors with nanostructures of $WO_3/g\text{-}C_3N_4$ as the cladding of a PMMA fiber have been proposed and investigate the ethanol gas sensing test. The $WO_3/g\text{-}C_3N_4$ nanocomposites exhibit excellent selectivity to ethanol gas, such as high sensitivity (62.5 at 500 ppm), faster response (30 s) and recovery time (25 s) than those of the pure WO_3. The possible mechanism for the enhanced ethanol gas sensing properties of $WO_3/g\text{-}C_3N_4$ nanostructures is proposed.

1. Introduction

In the current years, fiber optic gas sensors in vision of metal-oxides as the detecting medium have been reported for enhancing the gas sensitivity and selectivity and additionally for room temperature activity [1–6]. These sensors are invulnerable to electromagnetic interference, are minimal effort and could be utilized in hostile environments. The intensity of the light going through the fiber is exceptionally sensitive to the change in the refractive file of the cladding, which is influenced by the gas to be identified. Recently, gas sensors in view of semiconducting metal oxides, including SnO_2, In_2O_3, ZnO, TiO_2, and WO_3 and so forth, have been subjected to broad novel work because of their favourable highlights, for example, simplicity in device structure and circuitry, high sensitivity, flexibility, vigour and low cost [7]. Among the different metal oxides, tungsten trioxide (WO_3) is an adaptable wide band gap n-type semiconductor for some significant applications. To date, WO_3 has been a standout amongst the most widely examined materials for electrochromic devices, solar cell, gas sensor, bio sensors, photocatalyst, and catalysis in electrochemical process [8].

Recently, many researchers have been synthesized different morphologies of WO_3 nanostructures and studied their gas sensing properties. For example, Zhang et al. [9] have reported acetone gas sensing propertied WO_3 microspheres using one step hydrothermal

* Corresponding author.
E-mail address: vadivel.physics@gmail.com (S. Vadivel).

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OPTICAL CONSTANTS OF BRUSH ELECTRODEPOSITED $CuInTe_2$ FILMS

P. MUTHUSAMY[a], A. PANNEERSELVAM[b,*]
[a]*Anna University, Research scholar, Chennai – 600 025*
[b]*Department of Physics, Paavai Engineering College, Pachal – 637 018*

Electrodeposition method has been used to deposit of $CuInTe_2$thin films on transparent glass substrate with thickness range from 200 to 400 nm at various temperatures ranging from 30° to 80°C by using the brush. UV visible spectrometer was used to record the transmission spectra of $CuInTe_2$ thin films in the wavelength rangebetween 900 to 1800 nm. It is revealed that the optical energy gap (Eg)is increased from 0.96 eV to 1.01 eV when the substrate temperature decreases. The variation in refractive index and extinction coefficient with photon energy werestudied and material properties such as dielectric constant, plasma frequency, and carrier density to effective mass, dispersion, oscillator energy and optical moments were estimated.

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*Keywords:*Semiconductor, Thin films, Electronic material, Optical properties

1. Introduction

$CuInTe_2$ (CIT) is a novel material for solar energy application due to the following characteristics such as absorption co-efficient, near infrared band gap, non linear susceptibility [1, 2]. This material could have large tolerance to stochiometrycondition when compared to other ternary and binary compounds [3]. CIT thin films have been deposited by may methodssuch as slow thermal evaporation [4], spin coating [5], calcinationsof stacked elemental layers [6]and co-evaporation of elements [7], pulsed laser deposition [8], electro-deposition [9], pulse plating [10] and brush plating method [11]. Amongst all the methods, the brush plating technique is a good and simple method thin film deposition. It is an effective and cost effective.

Brush plating can be called as particular plating or swab plating technique. It is an extremely helpful and simple method for contact plating. In its least complex shape, the brush plating process is seems to be painting.Brush plating gear contains control packs, solutions,plating instruments, anode spreads, and assistant hardware. The power pack has two leads. One is correspondedwith the plating instrument and the other is corresponded with the workpiece to be plated. The anode is consists of a material which holds the necessary arrangement. The plate can be dipped in the solution and followed by the brushes against to the surface of the workpiece that will be done. At the particular point, the anode touches the work surface so as to frame the circuit and finally electrodeposit is produced. Plating occurs just when the anode contacts the workpiece. Besidesthe brush plating process and the plating instrument is fixed firmly in movement at whatever point it contacts with the work surface.

Therefore,Inthis work, CIT films were brush plated on tin oxide coated glass substrates in the (5 ohms sq). The complete procedure of depositing CIT films is explained in the literature [11]. In our previous work, results were obtained on CIT films deposited for 20 min [11]. In this work on the optical properties of CIT films deposited for 10 min at various substrate temperatures is reported and discussed. Finally optical constants were also established form the optical studies. The author were attempted to obtain result and deposited.

*Corresponding author: panneer.phy@gmail.com

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Ultrasonic and UV Analysis on Aqueous Non-Ionic Surfactants

N. CHITHRALEKHA[1] and A. PANNEERSELVAM[2]*

[1]Research Scholar, R&D Centre, Bharathiar University, Coimbatore-641046, Tamilnadu, India.
[2]Department of Physics, Paavai Engineering College, Pachal-637018, Tamilnadu, India.
*Corresponding author E-mail: panneer.phy@gmail.com

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ABSTRACT

The evaluation of various acoustical and thermo dynamical parameters which provide an idea into the nature of molecular interactions in aqueous non-ionic surfactant solutions. The measurement of ultrasonic velocity in aqueous solutions an important tool for the calculation of various acoustical parameters. These parameters have been computed through velocity, density and viscosity measurements of non-ionic surfactants (Saponin, Glucopon and Sorbitan sesquioleate) in aqueous medium. This above work was done for different concentration ranges at three different temperatures 303, 313 and 323K using Ultrasonic interferometer. The Critical Micelle Concentration (CMC) was determined to be 1.0% of Water-Saponin, Water - Glucopon, 0.8% of Water - Sorbitan sesquioleate system. These samples were characterised by UV studies.

Keywords: Ultrasonic study, Molecular interactions, Acoustical parameters, Saponin, Glucopon and Sorbitan sesquioleate.

INTRODUCTION

Ultrasonics is a very interesting subject during the recent years[1]. To understand the nature and strength of molecular interactions the ultrasonic study of liquids is very important[2]. The study of propagation of ultrasonic waves in liquids and liquid mixtures is extremely abundant helpful for examining the character of inter and intra molecular interactions. Physicochemical properties can be understood among the interfacing parts from ultrasonic velocity estimations and it may be combined with other exploratory information, such as density and viscosity to calculate different acoustical parameters. These are adiabatic compressibility, free length, acoustic impedance, relaxation time, free volume and internal pressure. This parameter values are important in understanding the molecular interactions in paired blends. Ultrasonic velocity is a vital physical parameter having physical dependency. [3,4]. In recent years studies on acoustic parameters have become an evolving hid[5,6]. Acoustic parameters are sensitive to changes and are useful in explaining the solute-solvent interaction. Furthermore the ultrasonic velocity measurements have been successfully employed to detect and assess weak and strong molecular interactions[7].

Surfactants are dispersed in aqueous solution it adsorbs at interface and self-assemble in

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ORIGINAL PAPER

Relative Role of Particle Size and Shape on the Magnetic and Catalytic Behavior of Nanozinc Chromite

G. Raja[1] · C. Ragupathi[2] · G. Sivaraman[3]

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Abstract

The purpose of this study is to define an effective synthesis for spinel-type zinc chromite ($ZnCr_2O_4$) nanoparticles by a simple microwave combustion method. The synthesized material was analyzed by X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), and from optical properties. A magnetic property for the material was examined through the vibrating sample magnetism. The distribution of the external magnetic lines of force and the self-generated magnetic field of ferromagnetic materials was taken into account in the presence of an external magnetic field. Zinc chromite showed good performances in catalytic oxidation, and the role of particle size and shape is highlighted.

Keywords Zinc chromite · Crystallinity · Optical properties · Magnetic properties · Spinel

1 Introduction

Increasing novel directions in the manufacture of nanocrystalline spinel type chromite are showing inspiring results to the nanochemists and the materials scientists. The general formula for spinels is AB_2O_4. In the spinel structure, the anions are organized in a cubic close-packed collection with the cations occupying the sites of the array. There are eight tetrahedral and four octahedral sites per molecule for $ZnCr_2O_4$. Zinc chromite is a mixed metal oxide with normal spinel structure, Cr occupies the octahedral sites, and the Zn occupies the tetrahedral sites in this spinel structure. In zinc chromite spinels, the tetrahedral and octahedral sites are considered important subjects, because their properties, such as, magnetic, semiconducting, catalytic, etc., are determined by the cation sites. Zinc chromite spinel structure is also of interest due to their technological applications as oxidation catalysts, having lower temperature sinterability, greater thermal stability, increased hardness, better diffusion, ductility, etc. [1].

Presently, commonly used fuel include gases mixed with urea, glycine, citric acid, l-alanine, and carbohydrazide in a suitable stoichiometric ratio which control the scorching procedure. As a consequence, crystallite size, morphology, textural, surface area, and other physicochemical properties are largely changed. Likewise, the usage of microwave energy as heating source, accelerates chemical reaction and kinetics, recovering the financial loss and decreasing the energy loss [2, 3]. Expanded synthetic methods like microwave synthesis [4], sol–gel [5], hydrothermal [6], etc., have been adopted for creating nanocrystalline spinel-type chromites. It is well-known that the microwave heating method is essentially different from conventional heating system. In the microwave technique, the temperature is completed within inside the substantial place. The heating is authentic and dissipated as the considerable energy conversion rather than by the energy transfer, which happens in conventional methods [7, 8].

The present paper deals with the investigation of the structure, morphology, optical, and magnetic properties of the prepared zinc chromite analyzed by XRD, HR-SEM, TEM, PL, and VSM spectra. This approach provides a one-step, simple, and inexpensive method for the preparation of the spinel zinc chromite nanoparticles.

✉ G. Raja
genuineraja2015@gmail.com

[1] Department of Chemistry, Paavai Engineering College, Pachal (Post), Namakkal, Tamil Nadu, 637018, India

[2] Department of Chemistry, SriRam College of Arts and Science, Veppampattu, Thiruvallur, 602024 Tamil Nadu, India

[3] Department of Regional Plant Quarantine Station, Meenambakkam, Chennai, 600027, India

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Research paper

Work-life balance of employees working in power sectors of krishnagiri district

A. Sathiya Priya [1] *, Dr. D. Muruganandam [2]

[1] *Ph.D. Research Scholar, Department of Management, Bharathiar University, Coimbatore*
[2] *Associate Professor, Department of Management, Bharathiar University PG Extension center, Palanisamy College of Arts campus,Perundurai,Erode*
**Corresponding author E-mail: sathiyapriy@gmail.com*

Abstract

The purpose of this study is to highlight the necessity of adopting work-life balance in a power sector. The paper examines different elements of work-life balance especially with reference to employees working in power sectors. The main objective of the study is to study the work- life balance and work satisfaction of the employees in power sector. Based on the empirical evidence, the study proposes that there is a need for focusing on factors that aid in enhancing the work-life balance among employees. The data for the study was collected from 100 employees working in a power sector of Krishnagiri District of TamilNadu. The data collected were analyzed and interpretation and it's derived by using tests like t-test, simple percentage analysis. The findings imply that employees expect rewards, awarding policies, special training, and stress less work from the company. Hence the study helped to find out the work- life balance among employees working in power sector.

Keywords: *Work Place; Work-Life Balance; Work Environment; Fringe Benefits; Employee Training.*

1. Introduction

"Work-life balance was coined in 1986 in reaction to the unhealthy choice many were making in favor of the workplace, as they opted to neglect family, friends and leisure activities in pursuit of corporate goals," according to the Work-Life Balance Centre, a Newton Burgoland, Leicestershire, U.K.-based think tank and council dedicated to helping workers gain control of their workloads.

Work-life balance is a broad concept [4] including proper prioritizing between "work" (career and ambition) on one hand and "life" (Health, pleasure, leisure, family and spiritual development) on the other. Related, though broader, terms include "lifestyle balance" and "life balance". Work-life and personal life are interconnected and interdependent. Spending more time in office, dealing with clients and the pressures of job can interfere and affect the personal life, sometimes making it impossible to even complete the household chores. On the other hand, personal life can also be demanding if you have a kid or aging parents, financial problems or even problems in the life of a dear relative. It can lead to absenteeism from work, creating stress and lack of concentration at work. It is clear that problems caused by stress have become a major concern for both employers and employees. Symptoms of stress are manifested both physiologically and psychologically. Persistent stress can result in cardiovascular disease, sexual health problems, a weaker immune system and frequent headaches, stiff muscles, or a backache and even back pains. It can also result in poor coping skills, irritability, jumpiness, insecurity, exhaustion, and difficulty concentrating. Stress may also perpetuate or lead to binge eating, smoking, and alcohol consumption.

2. Need for the study

It is essential to have the proper balance between the family and personal life. The purpose of the study was to measure the sector progress in quality of work-life area with a focus on the organization's administration issues. The study aims at finding the various aspects of work-life balance among the employees, which would impact increased performance.

3. Literature review

Hackman and Oldham (1976) drew attention to what they described as psychological growth needs as relevant to the consideration of Quality of working life. Several such needs were identified; Skill variety, Task Identity, Task significance, Autonomy, and Feedback. They suggested that such needs have to be addressed if employees are to experience a high quality of working life.

In contrast to such theory-based models, Taylor (I979) [15] more pragmatically identified the essential components of Quality of working life as; basic extrinsic job factors of wages, hours and working conditions, and the intrinsic job notions of the nature of the work itself. He suggested that a number of other aspects could be added, including individual power, employee participation in the management, fairness, and equity, social support, use of one's present skills, self-development, a meaningful future at work, social relevance of the work or product, the effect on extra work activities. Taylor suggested that relevant Quality of working life concepts may vary according to organization and employee group.

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An Idiosyncratic Tool for Retrieving Legal Web Documents Using SSARC algorithm

V. Annapoorani
Department of Computer Applications
Paavai Engineering College
Namakkal Tamilnadu
annapoorani504@gmail.com

Abstract- **The practice of law necessarily involves a significant amount of research. In fact, the budding lawyers spend much of their work and time researching for the perfect information. Law and order is a field too vast, too varied and too detailed for any budding lawyer to keep all of it. Furthermore, the law is a living thing, it tends to change over time. Thus, in order to answer client's legal questions, lawyers typically conduct research into the laws affecting their clients. One of the most challenging problems is to incorporate domain knowledge in order to retrieve more relevant information from a collection based on a query given by the user.**

Keywords- SSARC, Semantic, Optimization, Physical

1. INTRODUCTION

The web domain contains lot of information on huge variety of documents in non-order groups. In this 21st century, all the details instantly available at our fingertips with the advent of Information Technology (IT). The searching of required information from huge database is difficult A.Smeulders.(2004),. Various search retrieval methods failed to retails the correct relational documents based on the knowledge process. In traditional method, we were limited to see through bookcases at the public library moving carelessly through the books in hopes of searching information. After the World Wide Web (WWW) developed, users gets all the information instantly. On WWW, the displaying list includes a link to the web page, the page's title and important points from the web page with the key term highlighted. With this modern era, the increasing availability of documents in digital form creates opportunities and challenges for all community and Information Technology researchers Chinatsu Aone, S. W. (2005). In this WWW, legal community also increases the number of legal documents using internet. While digitized documents facilitate searching all documents that are related to the task at hand and including a large number of them are not an easy task.

2. RESEARCH METHODOLOGY

In this SSARC algorithm, one can collect the legal documents from the web and to make available the whole collection list of civil cases to the lawyers. In our clock designing, similar to the normal clock, alphabet is used instead of the numbers 1 to 12. This SSARC algorithm is used to clustering methods for collecting and sorting the legal documents from the web Blair, D, Maron, M, E.(2008). This collecting, sorting, and storing work done by circular linked list in data structure, each node in the list is an alphabet, very first node collecting the a starting name of the legal documents. Each node in this linked list only holds the index of the civil case for the purpose of saving space. Each index consists of the links which holds the whole detail of that particular case Granger, (1977).

The below figure 1 shows the proposed implementation of Spontaneous Sorting and Retrieving Clock (SSARC) by various stages. This produce efficient search to retrieval legal web document have optimize best resultant with lower complexity. The following are the steps to process the documents analysis

2.1. Preprocessing

In this stage, the method reads the web document dataset holds the data point initialization. From the data points retrieved, the method identifies the nontrivial terms and list of the unique attributes of key terms J.Carbonell (2008). Then for each data terms performs Tokenization, Stemming, Remove Stop Words, and the method

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Characterization of Rainfall and Length of Growing Period Over North Western Zone of Tamil Nadu

N.K. Sathyamoorthy, A.P. Ramaraj, G. Dheebakaran[1], B. Arthirani[2], K. Senthilraja and R. Jagannathan[1]

Department of Agronomy, Agricultural College and Research Institute
Tamil Nadu Agricultural University, Madurai-625 104, India
[1]Agro Climate Research Centre, Tamil Nadu Agricultural University, Coimbatore-641 003, India
[2]Agricultural Research Station, Tamil Nadu Agricultural University, Koivilpatti, Tuticorin-628 501, India
Email: nksacrc@gmail.com

Abstract: Crop production particularly in rainfed condition depends solely on the rainfall pattern. Analyzing rainfall data to obtain specific information needed for crop planning and for carrying out agricultural operations are vital in an agricultural economy. The present study over northwestern zone (NWZ) of Tamil Nadu aims to explore the rainfall and its variability over space along with its length of growing period to make crop based decisions. Annual normal rainfall of NWZ is 811 mm. Denkanikottai (998 mm) had highest rainfall among the locations while Paramathi (518 mm) had the lowest. Among the monsoons; southwest monsoon (SWM) contributes 47 per cent of rainfall followed by Northeast monsoon (NEM) contributing 34 per cent. From July to November considerably good amount of rainfall was witnessed with peak during September over the NWZ. Annual, seasonal and monthly rainy days follow the trend of rainfall. LGP over the NWZ varied between 7 to 24 weeks irrespective of the methods employed. The location Salem had the highest LGP while Paramathi had the lowest. Comparing the methods FAO method results more number weeks than Jeevanandha Reddy method.

Keywords: Rainfall, Length of Growing Period, FAO method, Crop planning

In semiarid tropics, moisture is the major limiting factor for agriculture. The climate-triggered risks are heavy for crop production. Understanding spatiotemporal rainfall patterns has been directly implicated to combating extreme poverty and hunger through agricultural enhancement and natural resource management (IPCC, 2007). The amount of soil-water available to crops depends on variability of rainfall and growing period length, which influence the success/failure of a cropping season (Ngetich *et al.*, 2014). The variability in the rainy season onset and cessation could pose socio-economic and developmental challenges as they threaten food security and induce poverty (Cooper *et al.*, 2008 and Lacombe *et al.*, 2012). It thus emerges that, understanding climatic parameters, rainfall in particular, can aid in developing optimal strategies of improving the socioeconomic well being of smallholder farmers. There has been continued interest in understanding rainfall's seasonal patterns by evaluation of its variables including rainfall amount, rainy days, lengths of growing seasons, and dry-spell frequencies. Seleshi and Zanke (2004) and Tilahun (2006) noted high variations in annual and seasonal rainfall totals and rainy days and their importance in crop planning. On the other hand, the much-needed information on inter/intra seasonal variability of rainfall in the region is still inadequate despite its critical implication on soil-water distribution and final crop yield. To optimize agricultural productivity in the region, there is an urgent need to quantify rainfall variability at a local and seasonal level as a first step of combating extreme effects of persistent dry-spells/droughts and crop failure. Since rainfall that is heterogeneous, in particular, is the most critical factor determining rain-fed agriculture, knowledge of its statistical properties derived from long-term observation could be utilized in developing optimal cropping strategies in the area. Another vital analysis is length of growing period (LGP); it is the duration of growing period where in crops gets sufficient moisture for its growth continuously without any interruption. Computed LGP aids to select the suitable cropping pattern for a particular area in addition to selection of best agro techniques for identified LGP.

The agricultural activities in the North Western Zone (NWZ) are mainly rainfed dependent on monsoon rains. The rainfall characteristics in terms of quantity, distribution and length of growing season have always been uncertain due to variability of the season. The yearly variation makes the planning of sowing and the selection of the crop type and variety rather difficult. Generally, yields may suffer significantly with the length of the growing season, as well as with a high frequency of damaging dry spells within the growing season. The ability to estimate effectively the length of the growing

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Research Article

Response of Contemporary Maize Hybrids to Future Climate Change for Tamil Nadu, India

K. Shoban Chakravarthy*[1], R. Jagannathan[1], D. Rajalakshmi[2] and A.P. Ramaraj[2]

[1]Department of Agronomy, Tamil Nadu Agricultural University, Coimbatore-641003, Tamil Nadu, India
[2]Agro Climate Research Centre, Tamil Nadu Agricultural University, Coimbatore-641003, Tamil Nadu, India

Abstract

In Tamil Nadu, maize occupies an important place among the cereals produced for its commercial use. To sustain maize production, various adaptation options have been recommended in literature. Among the adaptation options, choice of cultivar stands out as one of the better and cost effective option. Thus three contemporary maize hybrids of Tamil Nadu were evaluated for its response to the changing climate. The maize hybrids used in this study were CMH08-282, NK 6240 and 900M Gold. All these hybrids were pre-calibrated and the genetic coefficients were utilized in the study. Weather data from climate models PRECIS and RegCM4 were used to drive the crop model. Results of the simulation revealed that, CMH08-282 had higher levels of yield for both control and CO_2 enrichment also for both the models PRECIS and RegCM4. Even though the rate of reduction was higher for CMH08-282, the yield level was considerably higher than other two hybrids. Response to CO_2 enrichment was outstanding for NK 6240 than other two hybrids with a 66.2 and 66.2 per cent increase over control for both PRECIS and RegCM4 respectively followed by CMH08-282 and the least response is from 900M Gold. Trend analysis infers a lesser rate of reduction for 900 M Gold over the century followed by NK 6240 and CMH08-282. It is evident that 900M Gold has comparatively stable yields over the century while NK 6240 had the highest response for CO_2 enrichment. Overall, the yield level of CMH08-282 outweighs and proves to be sustaining than the other two hybrids.

Keywords: Climate change, CO2 enrichment, DSSAT, Maize hybrids, Impacts

***Correspondence**
Author: K. Shoban Chakravarthy
Email: shoban86@gmail.com

Introduction

Maize is the major cereal crop after wheat and rice and often referred as "the king of grain crops" [1]. Maize is produced on nearly 100 million hectares, with almost 70 % of the total maize production coming from developing world with low and lower middle income countries. The ongoing climate change is projected to affect dramatically the development, water cycle and productivity of the staple crops in broad regions of the world [2, 3]. The ability of farmers to sustain cultivating maize in the future using current production practices is uncertain, for the given climate change projections. The long-term challenge of avoiding a perpetual food crisis under conditions of global warming is serious. Adaptation is a key factor that will shape the future severity of climate change impacts on food production [3, 4] and has recently received increasing attention.

Adaptation decisions occur on a range of temporal and spatial scales, from the crop management choices of smallholder agriculturalists, to the policy decisions made by governments and regional authorities [5, 6]. Research in developing countries indicate that, in principle, climate change impacts on agriculture can be reduced through human adaptations such as; adjusting sowing dates, changing cropping patterns [7-9] or adopting higher-yielding and heat resistant cultivars, and improved extension services [10, 11]. Among these options choice of cultivar is known to play a critical role and thus the present study was framed in such a way to address and identify the contemporary cultivars that have potential to adapt and sustain future change in climate.

Materials and Methods

Scenario selection

For this study A1B scenario was selected for both the regional climate models (PRECIS and RegCM3). The A1B emission scenario falls under A1 storyline that describes a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and the rapid introduction of new and more efficient

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LOCATION PRIVACY-PRESERVING ROUTING FOR PROTECTING VULNERABLE WSN FROM UNIVERSAL EAVESDROPPER

[1] A.Dhivya, [2] Dr.A.Suphalakshmi, M.E.,Ph.D.,
[1, 2] PG ScholarHead of the department in computer science,
[1, 2] Paavai Engineering CollegePaavai Engineering College.

ABSTRACT: While many protocols for sensor network security provide confidentiality for the content of messages, contextual information usually remains exposed. Such information can be critical to the mission of the sensor network, such as the location of a target object in a monitoring application, and it is often important to protect this information as well as message content. There have been several recent studies on providing location privacy in sensor networks. First argue that a strong adversary model, the global eavesdropper, is often realistic in practice and can defeat existing techniques. And then formalize the location privacy issues under this strong adversary model and show how much communication overhead is needed for achieving a given level of privacy. Also, it propose two techniques that prevent the leakage of location information: periodic collection and source simulation. Periodic collection provides a high level of location privacy, while source simulation provides trade-offs between privacy, communication cost, and latency. Through analysis and simulation, then demonstrate that the proposed techniques are efficient and effective in protecting location information from the attacker.

KEY WORDS: [Wireless sensor Network (WSN), Location privacy routing (LPR), Proxy-based Filtering Scheme (PFS) and Tree-based Filtering Scheme (TFS).]

1. INTRODUCTION

Sensor networks are often used in applications where it is difficult or infeasible to set up wired networks. Examples include wildlife habitat monitoring, security and military surveillance, and target tracking. For applications like military surveillance, adversaries have strong incentives to eavesdrop on network traffic to obtain valuable intelligence. Recently, several techniques have been proposed to deal with global eavesdroppers.

Location privacy is thus very important, especially in hostile environments. Failure to protect such information can completely subvert the intended purposes of sensor network

applications. Location privacy measures thus need to be developed to prevent the adversary from determining the physical locations of source sensors and sinks.

Due to the limited energy lifetime of battery-powered sensor nodes, these methods have to be energy efficient. Since communication in sensor networks is much more expensive than computation, use communication cost to measure the energy consumption of the protocols.

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An Ameliorate Binary Connectedness Based Despeckling Filter for Ultrasound Scans

Santhiya.P[1], Sivaranjani.M[2], Aruleeswari.R[3]

[1] *Assistant Professor, Department of Computer Science and Engineering, Paavai Engineering College, Namakkal.*

[2] *Assistant Professor, Department of Computer Science and Engineering, Paavai Engineering College, Namakkal.*

[3] *Assistant Professor, Department of Computer Science and Engineering, Paavai Engineering College, Namakkal.*

Abstract: Image denoising has become a very essential exercise all through the diagnosis especially in case of medical image processing involving ultrasound. Speckle is a multiplicative noise that degrades ultrasound images. The existence of speckle noise in ultrasound images reduces its resolution and contrast there by degrading the diagnostic accuracy of the ultrasound image. The presence of speckle noise in fetal ultrasound images make the conditions worse to carry out prenatal diagnosis of congenital heart disease. This is due to the impact of edge and local fine details that are not very clear for diagnosis. Thus there is a vital need for the development of a robust speckle reduction filter to enhance the quality of the speckle affected image and to preserve the essential features. In this paper, we propose a despeckling filter which is based on the concept of binary connectedness that uses an algorithm for computing the degree of connectedness of a pixel to all the other in a subjective neighborhood and it distinguishes the edge and background region present in an image. The proposed filter utilizes the Rayleigh distribution to model the speckle noise and establishes binary connectedness to distinguish edge from background region hence called as Binary connectedness based RML filter. The performance of the proposed filter is tested and compared with several existing despeckling filters including Median, Kuwahura and Frost filters to prove its expertise in terms several performance indices and image profile. Experimental results shows that the proposed filter removes the speckle noise effectively and thus outshine the conventional filters.

Keywords: Binary connectedness, Rayleigh distribution, Maximum likelihood estimator, Despeckling, Edge and background detection.

1. Introduction

Fetal echocardiography is the ultrasonic evaluation of the human fetal cardiovascular system. It is used for prenatal diagnosis of congenital heart disease. General antepartum obstetrical ultrasound has become a standard part of gestational care and is commonly used for the determination of fetal age, size, gender, or well-being and for the detection of congenital anomalies. They are non invasive in nature, cost effective and help in achieving continuous improvement in image quality. Performance and interpretation of fetal echocardiography requires a unique set of advanced skills and knowledge [1]. The fetal heart is of small size and dynamic in nature. Ultrasonic imaging is a widely used medical imaging procedure because it is economical, comparatively safe, transferable, and adaptable [7]. Though, one of its main shortcomings is the poor quality of images, which are affected by speckle noise. Only well skilled radiologists can deduce diagnostically important details effectively from the ultrasound images. Speckle in B-scans is seen as a granular structure which is caused by the constructive and destructive coherent interferences of back scattered echoes from the scatterers that are typically much smaller than the spatial resolution of medical ultrasound system. This phenomenon is common to laser, sonar and synthetic aperture radar imagery (SAR). Speckle pattern is a form of multiplicative noise and it depends on the structure of imaged tissue and various imaging parameters. Speckle degrades the target delectability in B-scan images and reduces the contrast, resolutions which affect the human ability to identify normal and pathological tissue. Usually prenatal diagnosis has to be performed well in advance in the first trimester of pregnancy. So the removal of speckle noise from ultrasound images and videos helps the untrained gynecologists in diagnosing the abnormalities. Thus it is much essential to develop a robust despeckling filter. The choice of despeckling filter and speckle model plays an important role in the design of despeckling methods and it differs from application to application. Speckle filtering is a central pre-processing step for feature extraction, analysis, and recognition from medical imagery measurements. An appropriate method for speckle reduction is one which enhances the signal to noise ratio while conserving the edges and lines in the image. There are also many statistical models are available to model the speckle noise pattern, although Rayleigh distribution is largely used to represent the fully developed speckle noise [2]. The ultrasound signal which gets

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Efficient Algorithm for Big Data Application

Santhiya R, Revathi M, Madanachitran R

Assistant Professor, Department of Computer Science and Engineering, Paavai Engineering College, Namakkal

ABSTRACT:
Data mining applications play an important role in IT firms where energy wastage is the main problem. Increase in workload and computation leads to high energy cost. Mapreduce scheduling algorithm is a model which is developed for processing and storing large volume of data at the same time. EMRSA is an algorithm gives reliable energy and reduction in maps based on arrangement priority based scheduling is provided to the test for utilization and system work is easily improved by reduction with maps.

Keywords: Big Data, EMRSA, Mapreduce, Incremental processing.

1 INTRODUCTION

Big data – both structured and unstructured – that overwhelms a business on a day-to-day basis. It's what organizations do with the data that matters. Big data can be analysed for visions that lead to well decisions and strategic business moves. The major areas covered finance, banking, education, E-commerce and so on.

Map reduce program is collected of map procedure that performs a summary operation. It is used to gather data according to the request. To progression big data proper scheduling is required to attain greater performance. Scheduling is a procedure of assigning jobs to available resources in a manner to diminish starvation and maximize resource utilization.

using one step algorithm and three step algorithm Iterative algorithm by various calculations Efficient mining characteristics, too energy.

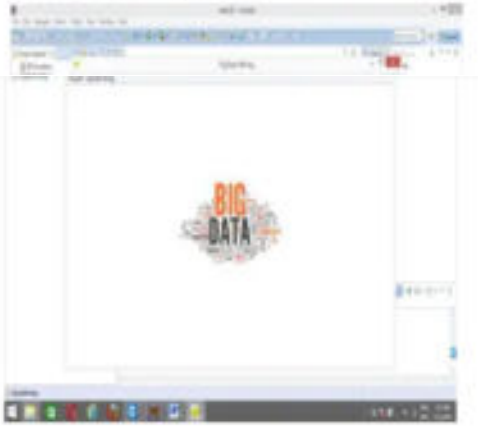

Fig.1 Structure of Big Data

The processing approach called energy map to reduce the scheduling algorithm .EMRSA is an algorithm which provide extra energy and fewer map. Based on priority scheduling is a task to allocate a based on the schedule

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Biologically Inspired Clustering algorithms in Mobile Wireless Sensor Networks: A Survey

[1]Sudha.M and [2]Sundararajan.J

[1]Assistant professor, Department of ECE, Paavai Engineering College, Namakkal, Tamilnadu, India.
[2]Principal, Pavai College of Technology, Namakkal, Tamilnadu, India.

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Address For Correspondence:
Sudha. M, Assistant professor, Department of ECE, Paavai Engineering College, Namakkal, Tamilnadu, India.

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ABSTRACT
In recent years, the utilization of Mobile Wireless Sensor Network (MWSN) goes on increasing tremendously in all kind of real-time applications. It includes security, computer networks, robotics, control systems, parallel processing, bio-medical engineering, data mining, power systems, mobile wireless sensor networks, agricultural application, production engineering, Industrial automation, and more. MWSN nodes are autonomous, self-powered with limited battery and easily prone to failure. The mobile nature of sensor nodes tends to scarce the network energy quickly which leads to reducing the longevity of the network. So that, a lot many clustering methods proposed previously to improve the network lifetime by reducing power consumption. In this paper, we provide a detailed survey on Biologically Inspired Clustering (BIC) algorithms. In general, BIC algorithms are stimulated by nature, brain, and evolutionary methods provide computational intelligence to resolve real-world problems which affords enhanced reliability, effective adaptation with added robustness and scalability. Hence, here, we address the related surveys presented previously and also illustrate the algorithms of BIC in MWSN. Further, we provide an insight work that can be done to enhance the existing clustering algorithms which help to improve the upcoming research.

KEYWORDS: Energy efficiency, Biologically Inspired Clustering (BIC), Mobile wireless sensor network (MWSN), Mobility, Network lifetime, Scalability.

Introduction

Lately, Mobile Wireless Sensor Network (MWSN) plays a vital role in all sort of special applications [1]. In some cases, mobile robots have been accessed rapidly for inaccessible places like the disaster, clone wars [2] and nuclear plants. MWSNs are similar to the wireless sensor networks (WSN) in which the sensor nodes are mobile in nature [3],[4]. At present, researchers and vendors are exclusively focused on sustaining mobility [5] in WSN [6]. Earlier, the authors [7] described a distributed protocol to get the minimum power topology for a mobile wireless network. While considering flat routing, MWSN has portable sensor nodes [8]which consist of many tiny nodes with sensing, processing and communicating (Transmitting as well as Receiving) capabilities. Several works went based on mobility of sink and sensor nodes [9],[10]to improve the network lifetime [11], [12]. But it operates under ultra low power which includes miniature in size.

The hierarchical routing techniques (clustering) are preferred by many authors to aggregate the data and to scale up the network performance [12]-[14]. So that energy efficiency will be increased. This causes the sensor nodes to survive for long duration [11]. A cluster arrangement provides some direct benefits like the spatial reuse of resources to enhance the network capability, with the non-overlapping multi-cluster structure [15].

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Title: Cluster-based routing using fuzzy and bee colony optimisation in mobile wireless sensor networks

Authors: M. Sudha; J. Sundararajan

Addresses: Department of Electronics and Communication Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India ' Pavai College of Technology, Namakkal, Tamil Nadu, India

Abstract: In mobile wireless sensor networks, the existing routing technique results in increased energy consumption, time consumption, delay, increased mobility, and so on. Hence, in this paper, we propose a cluster-based routing using fuzzy and bee colony optimisation in mobile wireless sensor networks. In this technique, cluster heads are elected using artificial bee colony (ABC) algorithm based on the mobility factor. Then, timeslots a assigned to each cluster member using TDMA schedule. Moreover, an inter cluster routing scheme is developed for the cluster members to route the collected messages using fuzzy logic based on the number of hops, battery level, and mobility factor.

Keywords: mobile wireless sensor networks; bee colony optimisation; cluster-based routing; CBR; time division multiple access; TDMA; maximum residual energy; fuzzification.

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Cross Layer Framework for Traffic Management During Vertical Handover in HetNets

Mrs.R.Mohanapriya [#1], Dr.K.B.Jayanthi [#2]

[#] ECE Department, Paavai Engineering College, Namakkal, India
[#] ECE Department, KSR College of Technology, Tiruchengode, India
[1] mprmpriya@gmail.com
[2] jayanthikb@gmail.com

Abstract—**Next Generation Heterogeneous Networks uncovers few challenges, which still exist and thwart in providing seamless services during mobility. Heterogeneous networks differ in their capabilities, services and scalability, therefore, to handle handoff mechanism it becomes more complex. It involves the integration of different access network technologies that differ in reliability, bandwidth or cost but intelligent enough to connect the entire world without limits. Handoff initialization and network selection are important phases to be performed well to ensure ideal QoS and better traffic management to customers. In this paper, a cross layer control mechanism is proposed for the execution of vertical handoff in three different networks (Wi-Fi, WiMAX and LTE) with the goal of maximizing the quality of service faced by each user in terms of packet dropping rate, handoff failure rate, and handoff latency. Simulations carried out using Ns-3 and results were obtained.**

Keyword - Cross layer information, Heterogeneous wireless networks, Vertical Handover, Traffic adaptation.

I. INTRODUCTION

The wireless network environment consists of different access technologies, such as Wireless Local Area Network (WLAN), Wireless Interoperability for Microwave Access (WiMAX) and 2G/3G/4G cellular mobile networks. In addition, within access technologies, there are different implementations resulting in different sized cells and features. Together these constitute a heterogeneous network environment, where different base stations (BSs) of different access technologies provide varying characteristics and capabilities. They support simultaneous connectivity to multiple overlapping access networks that may be based on multiple access technologies. For a satisfactory user experience, mobile terminals must be able to seamlessly transfer to the "best" access link among all available candidates with no perceivable interruption to an ongoing conversation which can be a video or voice session. Such ability to handover between heterogeneous networks is referred to as seamless vertical handovers [1].

Whether a handover is mobile device-initiated or network-initiated, finding the most optimal handover target in the range of the mobile device currently requires network scanning in different bands. Potential handover targets may be lacking and then use of the current access will need enhancement. In this case, traffic priority management, user priorities, and sharing the available transmission resources more efficiently for the application data become more momentous factors. Traffic-priority and QoS-class-based packet scheduling schemes have been implemented in basically all novel broadband wireless systems such as LTE [6], WiMAX [5], and WLAN [4].

In this paper three different networks are considered namely WiFi, WiMAX and LTE. LTE or long-term evolution, is a type of mobile broadband that rivals WiMAX Both services are IP-based and use a technology called orthogonal frequency-division multiplexing (OFDM) access. They also use a type of wireless technology that lets people get high-speed Internet across coverage areas that span miles. Table [1] shows the comparison of different parameters of the three different networks [3].

Current Medical Imaging

Title: An Enhanced Medical Diagnosis Sustainable System for Brain Tumor Detection and Segmentation using ANFIS Classifier

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Author(s):S. Kumarganesh* and M. Suganthi

Affiliation: Department of Electronics & Communication Engineering, Paavai Engineering College, Namakkai, Tamil Nadu, Department of Electronics & Communication Engineering, Mahendra College of Engineering, Namakkai, Tamil Nadu

Keywords: Brain tumor (https://www.eurekaselect.com/search/aws_search.php?searchvalue=Brain tumor), impulse noise (https://www.eurekaselect.com/search/aws_search.php?searchvalue= impulse noise), features (https://www.eurekaselect.com/search/aws_search.php?searchvalue= features), classifiers (https://www.eurekaselect.com/search/aws_search.php?searchvalue= classifiers), brain tissues (https://www.eurekaselect.com/search/aws_search.php?searchvalue= brain tissues), Local Binary Pattern (LBP). (https://www.eurekaselect.com/search/aws_search.php?searchvalue= Local Binary Pattern (LBP).)

Abstract: Background: Medical imaging plays a key role in detecting and diagnosing abnormal patterns from scanned images. The computer aided automatic detection of the brain tumor was proposed in this work using Adaptive Neuro Fuzzy Inference System (ANFIS) classifier.

Methods: The proposed system has the following stages as noise reduction, Gabor transform, feature extraction and ANFIS classifier. The impulse noises in the brain images were detected and removed using directional filtering algorithm. Gabor transform transformed the spatial domain image into multi resolution image and further Pixel invariant, Local Binary Pattern (LBP) and Discrete Wavelet Transform (DWT) features were extracted from the Gabor transformed image and these features were given to the ANFIS classifier to classify the image as either normal and abnormal.

Discussion: The morphological operations were then applied over the abnormal image to segment the tumor regions.

Conclusion: The proposed system achieved 99.8%sensitivity, 99.7%specificity, and 99.8% accuracy for the brain tumor detection.

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Full-Scale Testing and Performance Evaluation of Passive RFID System for Positioning and Personal Mobility

Krishnaraj.D[1], Sathish.K.R[2], Tamilselvan.S[3],Kumarganesh.S[4]
UG (ECE) Students[1, 2 & 3], ASP[4], ECE, Paavai Engineering College

Abstract

The Location of a person in a bounded area can be attained by Wi-Fi Positioning System (WPS). WPS is used to identify the person or object which is equipped with inside the human habitation area using radio waves collected by smart devices. The proposed system focuses to track an individual person in an environment. The location of the person can be achieved by Radio Frequency Identification (RFID) transponders. The RFID trackers accomplish with the Unique Device Identification (UDI). The procedure is deployed using an RFID sensor based application which pinpoints the location of the personnel inside architectural frameworks. The position co-ordinates in the indoor area can be using the Wi-Fi technology. The mechanism is split into two sections - Data Collection and Position Identification. The data collection combines the location information acquired from the sensor technologies. The identification of an individual with RFID transponders which results in the tracking the person. The location information obtained from the sensors are without time constraints and is updated in the RFID readers and databases including the time when they read. Design and development of the application from connecting to the sensor devices, distance estimation between the sensor devices and the person, retrieval of the exact position information are deliberated. The mechanism of the finding location of a person is executed in with position estimation algorithm.

Keywords: *RFID, WPS, communication, GSM, spread spectrum, UDI.*

I. INTRODUCTION

Radio frequency (RF) technology is used in many different applications, ware houses, companies, educational institutions and automatic identification systems. RFID stands for radio frequency identification and describes the use of radio frequency signals to provide automatic identification. Unlike the electronic article surveillance (EAS) systems used for theft detection, RFID provides a unique serial number for identification of an object. RFID is used in the Mobile Speed pass system to pay for gas without going into the store, in automobile immobilizer systems to prevent theft by uniquely identifying a key with an embedded chip, in Fast Lane and E-Z Pass toll road systems to automatically pay tolls without stopping, in animal identification, in secure entry cards to secure access to buildings, and in the supply chain to manage the flow of pallets, cases, and items. RFID technology was invented in 1948, but it was not commercialized until the 1980s. One of its first known applications was during World War II, when it was used by the British radar system to differentiate between friendly and enemy aircraft with attached radio transponders.

Most media accounts of RFID are actually about one form of RFID, the electronic product code (EPC) system. Initially, RFID was being used to identify objects in the MIT robotics laboratory but was found to be useful for managing the supply chain. The electronic product code (EPC) was developed by the Auto-ID Center at MIT and is now being managed by EPCglobal Inc. EPCglobal Inc. is a nonprofit global standards organization commercializing the Electronic Product Code (EPC) and RFID worldwide. It is one important form of RFID used by retailers to manage the supply chain. EPC has standardized chip designs and protocols to enable the mass production of low-cost passive RFID tags in the 860-960 MHz range. EPC technology is more or less equal to the uniform product code (UPC) barcode identification used to provide information about the product to which the EPC tag is attached except that it can be read at a distance and does not require line-of-sight aiming like the barcode system. In this WPS replaces GPS technology in the indoor premises.

Particle swarm optimisation-based parameters optimisation of PID controller for load frequency control of multi-area reheat thermal power systems

K. Jagatheesan*

Department of Electrical and Electronics Engineering,
Mahendra Institute of Engineering and Technology,
Namakkal, Tamil nadu, India
Email: jaga.ksr@gmail.com
*Corresponding author

B. Anand

Department of Electrical and Electronics Engineering,
Hindusthan College of Engineering and Technology,
Coimbatore, Tamilnadu, India
Email: b_anand_eee@yahoo.co.in

Sourav Samanta

Department of Computer Science and Engineering,
University Institute of Technology,
BU, Burdwan, Westbengal, India
Email: sourav.uit@gmail.com

Nilanjan Dey

Department of Information Technology,
Techno India College of Technology,
West Bengal, India
Email: neelanjan.dey@gmail.com

Amira S. Ashour

Department of Electronics and Electrical Communications Engineering,
Faculty of Engineering,
Tanta University,
Egypt
Email: amirasashour@yahoo.com

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AGC of multi-area interconnected power systems by considering different cost functions and Ant Colony Optimization technique based PID controller

K. Jagatheesan[a,*], B. Anand[b], Nilanjan Dey[c], M. Omar[d] and Valentina E. Balas[e]
[a]*Department of Electrical and Electronics Engineering, Mahendra Institute of Engineering and Technology, Namakkal, TN, India*
[b]*Department of Electrical and Electronics Engineering, Hindusthan College of Engineering and Technology, Coimbatore, TN, India*
[c]*Department of CSE, Techno India College of Technology, West Bengal, India*
[d]*Faculty of Engineering at Shoubra, Benha University, Benha, Egypt*
[e]*Faculty of Engineering, Aurel Vlaicu University of Arad, Arad, Romania*

Abstract. Automated industries require high quality of power supply for better performance. Therefore, power generating units play crucial role. In this work, multi-area power system incorporates six area thermal power systems with different steam configuration is investigated with Automatic Generation Control (AGC). The investigated system included non-reheat thermal power system in area 1 and 2, while area 3 and 4 are single reheat thermal power system and area 5 and 6 are double reheat thermal power system. All areas are interconnected through tie-line. A Proportional-Integral-Derivative (PID) controller is proposed as a secondary controller to provide the necessary control signal during sudden load demand. To achieve optimal PID controller performance, the controller gain values are optimized by considering nature inspired meta-heuristic algorithm, namely the Ant Colony Optimization (ACO) technique using different objective functions. Time domain specification analysis is considered to evaluate the performance of investigated power system, where the power system is designed and modeled under Matlab/Simulink environment. Finally, simulation results established that Integra Time Absolute Error (ITAE) objective function based PID controller provided superior performance compared to other objective function based PID controller.

Keywords: Automatic generation control, multi-area power systems, objective function, proportional-integral-derivative

1. Introduction

Nowadays, industries are modernized through which powers are reduced by replacing suitable drives to improve the overall efficiency and quality. This is achieved based on the power quality, where the drive's performance depends on the good quality power. The consistency in frequency and voltage decides the quality of the power supply. To guarantee stable power generating unit and to maintain power system's parameters within the specified value, many control theory has been developed for the past few decades. The developed control theory was concerned with single or multi-area interconnected power systems. The first Load Frequency Control (LFC) was published and discussed by chon [1]. Many different control techniques are proposed by researcher to balance power generation with load demand to maintain system stability.

*Corresponding author: K. Jagatheesan, Department of Electrical and Electronics Engineering, Mahendra Institute of Engineering and Technology, Namakkal, TN, India. E-mail: jaga.ksr@gmail.com.

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A comparative investigation on humidity sensing and photocatalytic applications of Sb doped SnO_2 by microwave combustion route

A. Rathinam, G. Balaji & S. Vadivel

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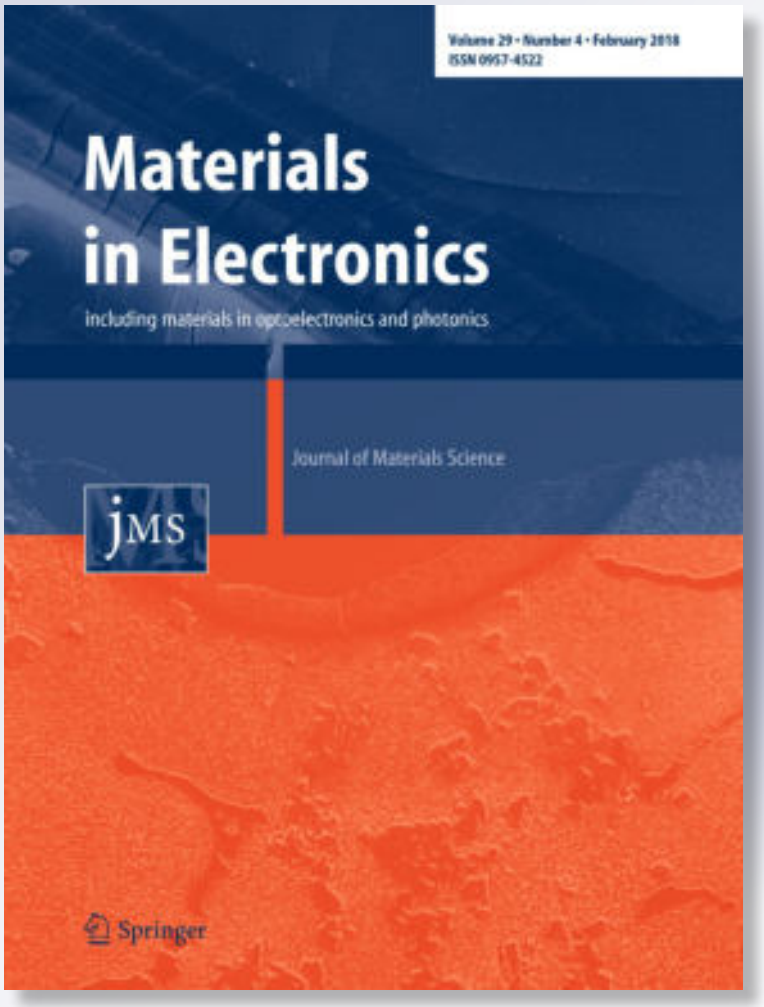

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New Approach for Precisely Measuring the Zero Sequence Parameters of EHV/UHV Transmission Lines

M. Maharaja and Dr.G. Balaji

Abstract--- A new method of measuring the zero sequence parameters of double-circuit EHV/UHV transmission lines with mutual inductance based on distribution parameter Model transmission line equations and distributed parameter model, a new approach is proposed to accurately measure the zero sequence parameters of long-distance double-circuit transmission lines using voltages and currents measured at the ends of lines. The mathematical model of the proposed method is explained in detail, the differential equations of two coupled lines with different self-parameters were solved for the first time with Laplace transform to get all the zero sequence parameters. And this approach is easy to implement since the measurement process is simple.

I. INTRODUCTION

The Ultra-high-voltage AC power transmission has outstanding advantages of high transmission capacity, long distance of power transmission, low line loss, small coverage, etc., which is an energy-saving and eco-friendly advanced power transmission technology. At present, China has three 1000 kV AC UHV projects completed in operation in total. As construction of UHV lines is underway, it is inevitable that power transmission lines in other voltage classes may parallel or cross with UHV lines in construction due to space limitation of power transmission corridor. While high-voltage lines are running, electromagnetic fields may arise in space surrounding the lines. As a result, induced voltage and current may arise in nearby low-voltage lines, triggering potential safety threats in low-voltage line shutdown overhaul. As UHV lines have high running voltage and transmission power, it is more necessary to focus on their induced power on low-voltage lines. Domestic and foreign studies on UHV AC power transmission line induction are more concerned with parallel construction. In Literature, computation and field measurement are made on induced voltage and current in 500kV one-tower two-circuit parallel line; in Literature, simulated computation and analysis are made on induced voltage and current in two-circuit UHV line with one line in power and one line in shutdown and 1000kV UHV and 500 kV/220 kV lines parallel with each other on the same tower respectively; in Literature, computation is made on induction of UHV AC power transmission lines on low-voltage power distribution lines below. Concerning line crossing, in Literature, methods of computation of power-frequency electromagnetic fields in crossing areas of AC power transmission lines are introduced; in Literature, theoretical computation is made on electrostatic induction of crossing and elongating conductors below 500 kV power transmission line.

Few systematic domestic and foreign studies are concerning power transmission line crossing induction. The field measurement is made of induced voltage and current of 110 kV crossing lines below UHV line simulated model is set up by CDEGS software to compute and analyze fluctuations in induced voltage and current of 110 kV lines under different transmission currents of UHV line, different crossing distances and crossing angles between UHV and

M.Maharaja, M.E. (PSE), Paavai Engineering College, Pachal, Namakkal, Tamilnadu. E-mail:maharaja12mk@gmail.com
Dr.G. Balaji, HOD, Department of Electrical and Electronics Engineering, Paavai Engineering College, Pachal, Namakkal, Tamilnadu. E-mail:peceeehod@gmail.com

Power Conditioning System Coupled with a Distributed Energy Resources Modelling and Control Design

C. Ilakkiya and Dr.G. Balaji

Abstract--- Today, Increase the demand for Renewable energy resources (RES) in distribution systems because total energy demand is supplied by the burning of fossil fuels and it is limited. In this paper presents a control strategy of three-phase grid interfacing inverter to effectively utilize the renewable energy Source with a grid. Controlling of the inverter in such a way that to utilize the following compensate load current, compensate load voltage, compensate load reactive power and load neutral Current. The Renewable Energy Source may be Solar or Wind depends on distribution system voltage level. All these works of the inverter are done either individually or combined to overcome the unbalanced effects of all types of linear, non-linear, balance or unbalance loads at the distribution level. This new control concept is demonstrated with extensive MATLAB/Simulink simulation to validated result.

I. INTRODUCTION

The solar and wind power has become more and more significant, attractive and less expensive, since the oil crises of the early 1970s. Even though there is a need to use renewable energy sources, the main problem with it is the dependency on environmental conditions like solar irradiance and wind speed. Micro-grids found popularity over the years due to the needs for distributed generation and with the integration of HRESs including photovoltaic (PV) and wind generators as well as the battery storage devices. The micro-grids have many benefits for both utility grids and customers, such as higher power quality, reduction in carbon emission, energy efficiency and reduced costs. Another capability of micro-grids is islanding which allows the micro-grid to be disconnected from the utility grid in case of upstream disturbances or voltage fluctuations.

The Energy has been discussed worldwide during last few decades. Replacing traditional fossil energy gradually is urgent nowadays. Wind power, as a kind of renewable energy, plays an important role in the sustainable generation and will be developed further in the future. Variable speed wind generators are now the most prevalent wind power generators and have been widely adopted in wind farms. The most prevalent control method utilized in variable speed wind generators is vector control. Although alternative control methods have been proposed, vector control is indispensable under certain situations such as ac-fault. Phase-Locked-Loop (PLL), estimating frequency and angle of terminal voltage, is indispensable in vector control. The situation that output frequency, which is determined by the PLL, is identical with the power grid frequency is regarded as grid-synchronization. However, it has been reported that PLL based vector control has synchronization problems under weak connection.

The Main difference between strong connection and the weak connection is the short-circuiting ratio (SCR) at the point of common connection (PCC) of a wind farm. High line impedance or low grid voltage leads to low SCR, i.e. weakness. Consequently, the terminal voltage of wind farm is more vulnerable to the weak connection. The terminal

C.Ilakkiya, M.E (PSE), Paavai Engineering College, Pachal, Namakkal, Tamilnadu. E-mail:ilakkiyachinnusami@gmail.com
Dr.G. Balaji, HOD, Department of Electrical and Electronics Engineering, Paavai Engineering College, Pachal, Namakkal, Tamilnadu. E-mail:peceeehod@paavai.edu.in

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A Facile Route to the Synthesis of Zn-Doped CdO Nanostructures and a Comparative Investigation on Humidity-Sensing and Photocatalytic Applications

G. BALAJI,[1] A. RATHINAM,[1] and S. VADIVEL [2,3]

1.—Department of Electrical and Electronics Engineering, Paavai Engineering College (Autonomous), Namakkal, Tamilnadu 637 018, India. 2.—Department of Physics, Paavai Engineering College (Autonomous), Namakkal, Tamilnadu 637 018, India. 3.—e-mail: vadivel.physics@gmail.com

Pure and zinc-doped CdO nanoparticles were synthesized via a novel microwave combustion method. The structural, morphology, chemical composition and optical properties of the samples were systematically investigated. The powder x-ray diffraction patterns reveal that both pure and doped samples are of a single crystalline nature with a cubic Fm3m CdO structure. Spherical-shaped morphology with an average diameter of around 25–35 nm was observed by field emission scanning electron microscope analysis. Optical studies showed that Zn^{2+}-doped CdO decreases the band gap energy (E_g) from 3.42 eV to 3.12 eV. The sensor was produced via an extremely simple process in which Zn-CdO powders were deposited directly into an interdigital electrode immersed in a chemical bath under ambient conditions. The proposed sensor showed almost linear behavior within a chosen range of humidity (between 10% and 90% RH) and fast response (25 s) and recovery time (20 s). Our reproducible experimental results exhibited that Zn-doped CdO nanoparticles have a great potential for humidity-sensing applications in room temperature operations. The samples were further investigated for their photocatalytic activity by degradation of Rhodamine B and Methyl orange under UV light irradiation. The improved photocatalytic mechanism by Zn doping is also discussed in detail.

Key words: Zn-doped CdO, humidity sensor, high sensitivity, UV light irradiation, Rhodamine B

INTRODUCTION

For the past 20 years, concern about environmental safety has prompted much research in sensor development. Even though a variety of sensors has been developed in the process industries, agriculture, medicine and many other areas, the development of sensing materials with high sensing capabilities is still proceeding at an unprecedented rate. Among the various types of sensors (gas, mechanical, optical, thermal, etc.), the humidity sensor is one of the most crucial for industry as well as human life. In recent years, different types of ceramic oxides have been consistently investigated as humidity-sensing materials.[1] Semiconducting oxide-based humidity sensors have shown positive advantages when compared to other types of humidity sensors, such as low cost, simple construction, small size and ease of placement in the operating environment.[2] The electrical conductivity of the metal oxide changes depending on the surrounding gas and humidity on the surface. Thus, they are useful sensing materials for the production of cost-efficient gas-sensing and humidity sensor-based devices.[3] Among these, cadmium oxide (CdO) is one of the most important metal oxide semiconductors due to its outstanding optical and electrical

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Analysis of Harmonic Distortion Impact on Grid Connected Solar Power Inverter

A. Sindhuja and A. Rathinam

Abstract--- The Power Quality Analysis impacts of the grid-connected photovoltaic power plant on the harmonic current in the power quality aspect of the distribution network, Summaries the requirement of harmonic current injecting in grid caused by photovoltaic power plant which connected in user side. The grid-connected photovoltaic generation and then analyzes it by build models of photovoltaic generation and the power grid. At the same time, it can cause harmonics which result in waveform distortion and affect electronic devices that receive power. Then, it could make electronic device malfunction. This paper studies the characteristics of harmonics on the grid, PV system, and load. The result shows that most grids' harmonics are affected from PV system and load when the inverter power up to almost the rated power, meanwhile, percentages of harmonics are reduced and harmonics of load depend on the type of load. Next, comparing harmonics on three sides, and found that harmonics of PV system hardly affect to load and harmonics of the grid are more affected by load than PV system.

Keywords--- Distributed Generation (DG), Harmonic Distortion, Photovoltaic Energy (PV), Power Quality, Solar Inverter.

I. INTRODUCTION

Renewable energy technology has undergone a substantial development in the last three decades. Photovoltaic (PV) system is promising and one of the fastest growing renewable energy sources. The worldwide cumulative installed capacity of PV systems has been increasing exponentially in the last decade and recently has reached a level of 178GW at the end of 2014 due to the decreasing price per PV panel and government policies in many countries. The photovoltaic generation technology which based on utilizing solar energy is growing rapidly according to the medium and long-term renewable energy. A large amount of photovoltaic generation integrated with grid promotes the utilization of solar resources; on the other hand, the photovoltaic generation brings new challenges on the planning and designing, power quality, operation, protection etc. The output power of PV generation is affected greatly by light illumination with the characteristics of volatility, intermittent and periodicity which would cause the voltage fluctuation and voltage flickering of the grid. With the proportion of PV generation in power resources becoming larger, the influence of the characteristics of volatility, intermittent and periodicity on peak shaving of the grid will be greater which would cause the frequency of grid variation. And, there are voltage pulses, surge, voltage sag and momentary interruption dynamic power quality problems caused by PV generation.

There are many hazards of harmonic in power system, mainly are causing protection fault, resonance, over-voltage, over-current and increasing loss of transmission lines and motors. The purpose of adjusting reactive power and voltage is to guarantee the voltage level and power quality on the point of common coupling (PCC) of photovoltaic (PV) plant. The capability of voltage adjustment and reactive power providing is varied with the development of technology. A harmonics from PV system and the effect of inverter have been reviewed. The Harmonic interactions between the grid and a certain number of DG inverters can be preliminarily estimated. The

A. Sindhuja, M.E (PSE), Paavai Engineering College, Pachal, Namakkal, Tamilnadu. E-mail:sindhuja.tamil9@gamil.com
A. Rathinam, Professor, Department of Electrical and Electronics Engineering, Paavai Engineering College, Pachal, Namakkal, Tamilnadu.

An Modified Renewable Energy Integration System with Motor Generator Pair Using Fuzzy Logic Controller

M. Karthik and Dr.A. Rathinam

Abstract--- The Motor-generator Pair load tests and power characteristics shown in the tests. The major purpose of the operations Motor-generator Pair was to check power characteristics such as voltage and frequency and to stabilize the system. The Motor-generator Pair for Renewable Energy Integration synchronous generator, converters do not have inherent inertia which is important for frequency response. More complex interaction induced by renewable energies cause's problems of power system dynamics, for example, damping oscillation. In addition, converters cannot support high fault current, leading to limitation of some existing control schemes during transient events. However, compared with converters, the synchronous generator has some advantages to solve the aforementioned problem. However, compared with converters, the synchronous generator has some advantages to solve aforementioned problems. Therefore, this study proposes a synchronous motor-generator pair (MGP) system as a possible grid-connection way for high penetration of renewable energies to improve stability. The rotor angle relation, active power regulation, small signal stability and frequency response are important for inertia and stability of the grid. However, compared with converters, the synchronous generator has some advantages to solve aforementioned problems. Therefore, this study proposes a synchronous motor-generator pair (MGP) system with a stochastic fuzzy controller as a possible grid-connection way for high penetration of renewable energies with a Fuzzy controller to improve stability. Finally, the simulation result has been derived in MATLAB /Simulink with the required formulation.

Keywords--- Renewable Energy Integration, Synchronous Motor-generator Pair, Fuzzy Controller.

I. INTRODUCTION

Renewable Energy Integration focuses on incorporating renewable energy, distributed generation, energy storage, thermally activated technologies, and demand response into the electric distribution and transmission system. A systems approach is being used to conduct integration development and demonstrations to address technical, economic, regulatory, and institutional barriers to using renewable and distributed systems. In addition to fully addressing operational issues, the integration also establishes viable business models for incorporating these technologies into capacity planning, grid operations, and demand-side management.

The wind and solar photovoltaic (PV) had record additions for the second consecutive year, accounting for about of new installations. The Penetration rate of more than even higher has appeared in some countries and districts. However, the high penetration rate of renewable energies also brings challenging reliability and security issues to a power grid. One major challenge is frequency instability induced by replacement of synchronous generator. The Rotor speed of the synchronous generator is tightly coupled with grid frequency hence its moment of inertia can be extracted to support frequency deviation. However, renewable energy sources generally cannot provide enough inertia. For example, doubly fed induction

M. Karthik, PG Scholar, Department of PSE, Paavai Engineering College, Pachal, Namakkal, Tamilnadu. E-mail:karthikeeepgo@gmail.com
Dr.A. Rathinam, Professor, Department of EEE, Paavai Engineering College, Pachal, Namakkal, Tamilnadu.

A comparative investigation on humidity sensing and photocatalytic applications of Sb doped SnO_2 by microwave combustion route

A. Rathinam, G. Balaji & S. Vadivel

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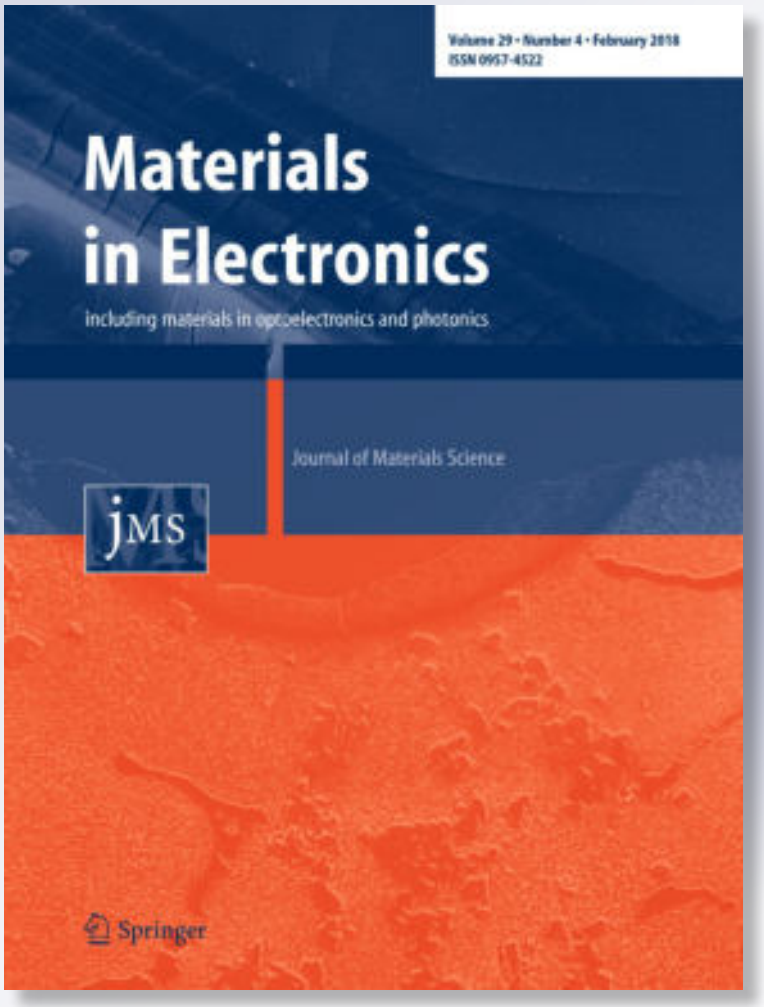

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A Facile Route to the Synthesis of Zn-Doped CdO Nanostructures and a Comparative Investigation on Humidity-Sensing and Photocatalytic Applications

G. BALAJI,[1] A. RATHINAM,[1] and S. VADIVEL [2,3]

1.—Department of Electrical and Electronics Engineering, Paavai Engineering College (Autonomous), Namakkal, Tamilnadu 637 018, India. 2.—Department of Physics, Paavai Engineering College (Autonomous), Namakkal, Tamilnadu 637 018, India. 3.—e-mail: vadivel.physics@gmail.com

Pure and zinc-doped CdO nanoparticles were synthesized via a novel microwave combustion method. The structural, morphology, chemical composition and optical properties of the samples were systematically investigated. The powder x-ray diffraction patterns reveal that both pure and doped samples are of a single crystalline nature with a cubic Fm3m CdO structure. Spherical-shaped morphology with an average diameter of around 25–35 nm was observed by field emission scanning electron microscope analysis. Optical studies showed that Zn^{2+}-doped CdO decreases the band gap energy (E_g) from 3.42 eV to 3.12 eV. The sensor was produced via an extremely simple process in which Zn-CdO powders were deposited directly into an interdigital electrode immersed in a chemical bath under ambient conditions. The proposed sensor showed almost linear behavior within a chosen range of humidity (between 10% and 90% RH) and fast response (25 s) and recovery time (20 s). Our reproducible experimental results exhibited that Zn-doped CdO nanoparticles have a great potential for humidity-sensing applications in room temperature operations. The samples were further investigated for their photocatalytic activity by degradation of Rhodamine B and Methyl orange under UV light irradiation. The improved photocatalytic mechanism by Zn doping is also discussed in detail.

Key words: Zn-doped CdO, humidity sensor, high sensitivity, UV light irradiation, Rhodamine B

INTRODUCTION

For the past 20 years, concern about environmental safety has prompted much research in sensor development. Even though a variety of sensors has been developed in the process industries, agriculture, medicine and many other areas, the development of sensing materials with high sensing capabilities is still proceeding at an unprecedented rate. Among the various types of sensors (gas, mechanical, optical, thermal, etc.), the humidity sensor is one of the most crucial for industry as well as human life. In recent years, different types of ceramic oxides have been consistently investigated as humidity-sensing materials.[1] Semiconducting oxide-based humidity sensors have shown positive advantages when compared to other types of humidity sensors, such as low cost, simple construction, small size and ease of placement in the operating environment.[2] The electrical conductivity of the metal oxide changes depending on the surrounding gas and humidity on the surface. Thus, they are useful sensing materials for the production of cost-efficient gas-sensing and humidity sensor-based devices.[3] Among these, cadmium oxide (CdO) is one of the most important metal oxide semiconductors due to its outstanding optical and electrical

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Maximum Power DFIG Control Algorithm using Interleaved and ANFIS Converter

Ramachandran.S, Dr.M.Ramasamy, Radha Krishnan.K,

Assistant Professor, Department of EEE, Paavai Engineering College, Namakkal, India

Associate Professor, Department of EEE, K.S.R College of Engineering, Namakkal, India

UG Scholar, Dept. of EEE, Paavai Engineering College, Namakkal, India

ABSTRACT: This study provides a review of past and present MPPT controllers used for extracting maximum power from the WECS and doubly fed induction generator (DFIG). Furthermore, some comparisons of two different methods have been carried out to validate the results. The chapter starts with a brief background of wind energy conversion systems of not needing the wind speed and wind turbine characteristics of the traditional HCS method, but it also improves the stability and accuracy of MPPT by estimating the exact loss torque. Then, main MPPT control methods are presented, after which, MPPT controllers used for extracting maximum possible power in WECS are presented. The presented strategy not only has the advantagesthe comparison analysis results indicate that the system using ANFIS can obtain higher voltage than the system using FLC. In addition, the proposed system is also able to reduce overshoot and be able to increase the output power.

KEYWORDS: Interleaved, ANFIS controlled, DFIG,direct drive; maximum power point tracking (MPPT).

I. INTRODUCTION

This method relies on a large amount of online computation, and thus, it would be difficult to achieve MPPT for fast varying wind speeds. Although the varying tracking step could be used to improve computation speed, this disadvantage cannot be eliminated. Recently, a proposed method of employing the power versus rotor speed characteristic curve is frequently used due to its simplicity in hardware and software [1]. The optimal reference power curve is constructed according to experimental tests and programmed in a microcontroller memory.

One could either measure the rotor speed or obtain the power reference to regulate the power or measure the wind speed and obtain the rotor speed reference to regulate the rotor speed [2]. The former produces more accurate output power while the latter will have faster control response. Aside from an accurate reference power curve, analysis is necessary to verify the stability of the method in terms of varying wind speed and output power [3] [4]. Few publications just address the stability issue of such method, but more detailed quantitative analysis should be conducted. This paper studies the performance of wind turbine under reference power curve MPPT power control. In particular, it presents a small-signal analysis on generator speed dynamics induced by variable wind speed. Also, an experimental setup to emulate the wind turbine operation in torque control mode is presented. Both steady-state and dynamic responses are implemented to verify the proposed analysis and conclusions [5]. Section IIwill present how to obtain the optimal reference power curve and analyze the stability of this method by conducting the small-signal.

II. RELATED WORK

- **OPTIMAL REFERENCE POWER CURVE AND STABILITY ANALYSIS**

The first important issue in characteristic power curve MPPT is how to obtain the reference power curve. The second issue is whether the generator speed and output power will converge to the points along this reference power curve regardless of the wind variations, i.e., “whether this method is stable with respect to the varying wind speed.” Section II-A will first capture the optimal reference operation points from the experimental tests when power variation

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Stability-integrated Fuzzy *C* means segmentation for spatial incorporated automation of number of clusters

V ROYNA DAISY[1,*] and S NIRMALA[2]

[1]Department of Electrical and Electronics Engineering, Paavai Engineering College, Namakkal 637 018, India
[2]Department of Electronics and Communication Engineering, Muthayammal Engineering College, Rasipuram 637 408, India
e-mail: roynadaisy@gmail.com; roynavedhanayagampec@paavai.edu.in; nirmala.ramkamal@gmail.com

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Abstract. Fuzzy *C* Means clustering, one of the predominant segmentation algorithms, requires prior knowledge of number of clusters in the image and is sensitive to noise and outliers. Determining the number of clusters and including spatial information to basic Fuzzy *C* Means clustering are done in numerous ways. Literature reveals that either number of clusters is defined or spatial information is incorporated. In the proposed work, spatial information and cluster determination are integrated based on the concept of stability. Implementation of split and merge algorithm to find the number of clusters is done based on the modified Sylvester's theorem in the context of positive definite functions. Experiments are performed on synthetic and real images and the number of clusters determined is validated using validation indices. Results show that correct clusters are classified with robustness to noise.

Keywords. Fuzzy *C* Means clustering; stability; positive definite functions; spatial information; validity index.

1. Introduction

Magnetic Resonance Imaging (MRI) is a vital diagnostic procedure used for analysing the neurological disorders that cause changes in the shape, thickness, mass and volume of brain tissues. Image processing is done in order to make quantitative and qualitative measurement of the alteration made to analyse and classify the disorders. The most crucial step in the process of image processing is image segmentation. Different image segmentation algorithms have been developed, yet each method has its own advantages and limitations.

The Fuzzy *C* Means (FCM) clustering, one of the powerful clustering techniques shown in literature, is a popular unsupervised classification method and has found many applications in pattern classification and image segmentation [1–5]. The application of clustering algorithms is constrained with its dependence on parameter setting and initialization. Although FCM is prominent for image segmentation, the results are mainly affected by the identification of number of clusters and the initialization of the centroids. In case of brain MRI, normally we go for segmenting the white matter (WM), grey matter (GM) and cerebro-spinal fluid (CSF) and hence the number of clusters can be set to three. However, in case of neurological disorders there are possibilities for tumours, lesions or blurring of normal tissues where we cannot predetermine the number of clusters. If the number of clusters is not set to the number of natural clusters or the centroids are initialized randomly, the clustering results would be unreliable and inconsistent. Hence, for automatic segmentation using FCM, clustering several techniques has been developed by determining the number of clusters [6–9].

A few algorithms that determine the cluster number have been proposed in the literature. A variety of self-splitting–merging clustering algorithms have been developed for determining the number of clusters. Zhang and Liu [10] proposed a self-splitting algorithm for clustering where the number of initial clusters is set to a minimum of two and the clusters are split based on a score function until the number of clusters reaches a predefined maximum. Sun *et al* [11] proposed a model-based selection algorithm, which involves high computational complexity as the splitting involves calculation of distance of all data vectors in the cluster with the remaining cluster centre. Lin and Chen [12] proposed a combinatorial splitting algorithm with cohesion merging. Splitting one cluster at a time will lead to high computational time. Hence, a multiple splitting algorithm was proposed by Liu and Ramamohanarao [13]. Yang *et al* [14] and RuiFa *et al* [15] have proposed automatic detection of cluster numbers. However, these methods involve distance calculation, which increases the computational time of FCM algorithm. Zanaty [16]

*For correspondence

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Performance Assessment of Eco-Friendly Refrigerant Mixtures Alternative to HCFC 22 in a Small Capacity Window Air Conditioner

Elumalai P.*,***, Vijayan R.**

*Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India

**Department of Mechanical Engineering, Government College of Engineering, Salem, Tamilnadu, India

***Corresponding Author Email ID: eluammu@gmail.com (mailto:eluammu@gmail.com?cc=gbehal@indianjournals.com)

Abstract

This paper deals with the experimental work, which has been carried out in 1 ton of refrigeration window air conditioner working with ternary refrigerant mixture namely R152a/R290/R600 (by weight 80%/10%/10%). The properties of selected refrigerant mixtures were obtained from NIST REFPROP 7.0 for comparative analysis and refrigerant performance of proposed blends and of R22 for the given operating conditions. From the test results observation, The performance coefficient of M3 were found to be higher than that of R22 by 5.25% and the compressor power of M2, M3, M5, M1 were found to be lower by 5.22%, 5.22%, 1.74%, 0.87% respectively. Based on the experimentation and calculation, it is found that this new proposed mixture could be considered as potential replacement candidat for R22 in many applications and has shown better results as far as performance parameters are concerned and in turn theyare benig to the environment

Keywords

R22, Window Air conditioner, Global Warming, Ternary mixture, Environment Zero ODP.

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OPTIMIZATION OF MICRO-EDM PARAMETERS USING GREY-BASED FUZZY LOGIC COUPLED WITH THE TAGUCHI METHOD

OPTIMIZACIJA PARAMETROV MIKROELEKTROEROZIJE Z UPORABO MEHKE LOGIKE V POVEZAVI S TAGUCHI METODO

Muthiyalu Shanmugam Vijayanand[1], Mani Ilangkumaran[2]

[1]Paavai Engineering College, Department of Mechanical Engineering, Pachal, 637018 Namakkal, Tamilnadu, India
[2]K.S.R. College of Technology, Department of Mechatronics Engineering, Tiruchengode, 637018 Namakkal, Tamilnadu, India
msvijayanand08@gmail.com

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The correct selection of process parameters for the best performance output of a micro-electro-discharge machining (Micro-EDM) process is challenging because the performance measures of micro-EDM are non linear. This work aims to solve and control complex non-linear systems by applying the hybrid grey-based fuzzy logic together with the Taguchi technique in the field of micro-EDM. Input parameters, namely, the discharge current, pulse-off time and pulse-on time were selected to obtain the target responses such as the material-removal rate (*MRR*) and tool-wear rate (*TWR*). Nine experiments were performed based on the Taguchi L_9 orthogonal array. An analysis of variance was performed to find the significant contribution of the intervening process parameter in a single performance characteristic using the grey-based fuzzy-logic expert system. Multi-performance characteristics indexes (MPCIs) were analysed and the results were calculated with good accuracy.

Keywords: ANOVA, fuzzy logic, orthogonal array, grey-based Taguchi technique, electrical-discharge machining, drilling

Pravilna izbira procesnih parametrov za doseganje najboljšega izkoristka procesa mehanske obdelave z mikroelektro erozijo (angl. Micro-EDM) je izziv, ker so procesni parametri mikro-EDM nelinearni. Namen pričujoče raziskave je bil reševanje in nadzor kompleksnih nelinearnih sistemov mikro-EDM mehanske obdelave z uporabo hibridne mehke logike (Grey-based fuzzy logic) v povezavi s Taguchi metodo. Avtorji raziskave so izbrali naslednje vhodne parametre: razelektritveni tok, čas vklopa in čas izklopa impulza. Na njihovi osnovi so dobili odgovore na zastavljeni vprašanji; kakšna je hitrost odstranjevanja materiala in kakšna je hitrost obrabe orodja. Na podlagi Taguchi L9 ortogonalne matrike so izvedli devet praktičnih preizkusov mehanske obdelave z μ-EDM. Izvedli so analizo variance, podprto z ekspertnim sistemom na osnovi mehke logike, da bi ugotovili učinek intervencijskega procesnega parametra pri eni sami spremenljivki. Določili so indekse učinkovitosti (angl. MPCIs) in izračunani rezultati so bili zelo točni.

Ključne besede: analiza variance (ANOVA), mehka logika, ortogonalna matrika, robustna statistična Taguchi metoda, mikro elektroerozija (μ-EDM), vrtanje

1 INTRODUCTION

In recent technological advancements, the products are to be lighter, thinner and smaller. Many advantages arise when a part is miniaturized, such as energy and space savings, accelerating chemical reactions, attractive appearance, and cost-effectiveness.[1] The Monel 400 alloy is considered as the most promising and the most commonly used nickel-based alloy because of its excellent corrosion resistance and toughness over a wide temperature range. The Monel alloy has been extensively used in the chemical industry, food-processing industry, heat-exchanger tubes, nuclear reactors, sub marines and ship propellers.[2] The Monel alloy work hardens rapidly as it undergoes a high strain during machining. This hardening effect decreases further machining of the alloys. Therefore, it is very difficult to machine these alloys using conventional machine tools.[3] Several research works[4–6] have been carried out and reported on machining the nickel-based alloys using different conventional and non-conventional machining methods. Micro-machining is the most fundamental technology used for the production of miniaturized parts and components.[7] Micro-EDM has been known as one of the indispensible micro-machining techniques with obvious advantages of machining complex structures with high aspect ratios, high precision and accuracy irrespective of workpiece material's hardness and toughness.[8] Micro-EDM uses electrical discharge between two electrodes, and the spark from them generates such an extremely high temperature that the material is removed by vapor bubble.[9]

Many studies[1–3] were performed previously on machining nickel-based alloys with EDM and electro-chemical machining. P. Kuppan et al.[10] investigated the effect of various process variables of EDM in deep-hole drilling of Inconel 718. The objective of this study is to investigate the interaction effects of the process variables such as peak current, pulse-on time, duty factor, and electrode speed on machining characteristics. The results reveal that the material-removal rate is more influenced

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ANN MODELLING OF SMALL HOLE DRILLING ON MONEL METAL BY USING ELECTRICAL DISCHARGE MACHINING

M.S.Vijayanand[1]*, M.Ilangkumaran[2],
[1]*Assistant Professor,
Department of Mechanical Engineering,
Paavai Engineering College,
Pachal – 637018.
Namakkal, TamilNadu, India.
Email :msvijayanand08@gmail.com*
Ph.No. +91-9787210077*
[2]Professor,
Department of Mechatronics Engineering,
K.S.Rangasamy College of Technology,
Tiruchengode – 637215.
Namakkal, TamilNadu, India

ABSTRACT

The selection of best combination of the process parameters in small hole drilling by Electrical Discharge Machining for an optimum material removal rate with a reduced tool wear rate can reduce machining time and yield better performances. Artificial Neural Network (ANN) has emerged as a powerful tool for modelling complex processes is used for achieving better performance parameter. Artificial Neural Network (ANN) with back propagation algorithm have been used for optimizing and modelling process. The experiments have been designed according to Taguchi L_9 orthogonal array. The input parameters were considered for conducting experimentation are namely Discharge Current, Pulse off time and Pulse on time respectively. The performance measures were Material Removal Rate (MRR) and Tool Wear Rate (TWR). ANN models have been developed with varying number of neurons in the hidden layer from 5 to 10. It was found that one hidden layer with 9 neurons predicted the best results. The predicted values were compared with actual experimental results and the predicted values were almost equal to the expected with very less error.

Keywords

Drilling, Electrical Discharge Machining , Artificial Neural Network and Response Surface Methodology.

Academic Discipline And Sub-Disciplines

Production, Machining and Intrinsic chemistry.

TYPE (METHOD/APPROACH)

Experimental and modelling

INTRODUCTION

Rapid technological advancements, the demands for micro parts in the field of micro electro mechanical system (MEMS), is being increasing [1]. Micro EDM has been identified as one of the powerful micro-machining techniques to machine micro components with obvious advantages of machining complex structures with high aspect ratios, high precision and accuracy irrespective of work-piece material hardness and toughness [2]. Micro-EDM has similar characteristics as EDM except that the size of the tool, discharge energy and axes movement resolutions are in micron level [3]. The application of micro holes found in cooling holes of rotary engine blades for jet engines, holes for ejector pins, core pins, aircraft fasteners, and vent holes for plastic moulds and starter holes for wire EDM operations [4]. In micro-EDM, many factors that affect the process performance these factors can be related either to the process parameters (such as voltage, peak current, pulse duration, spark gap and flushing conditions) or to the system (such as type of dielectric fluid, tool properties, chemical and physical material properties) [5]. Any small change in the process parameters may affect the performance of the process and quality of the micro hole which leads increased cost and waste of time. Due to the high industrial competitiveness, the prime need for manufacturing companies are to produce high quality products at the lower possible cost. Hence selection of suitable process parameter is very important in micro EDM since it has been carried out by conservative data provided by the manufacturers of EDM machine or by operator's experience. Shajan et al [6] formulated the mathematical model by using multiple regression analysis to report the relationship between input and output process variables. Sarkar et al [7] successfully developed a second order mathematical model by using response surface methodology in terms of machining parameters for surface roughness and cutting speed in wire EDM process. It was proved that surface quality of the workpiece decreased due higher cutting speed. Another study carried out to develop the mathematical model by using regression analysis in order to analyse the relationship between surface roughness and electrical input process parameters in wire EDM process is done by Esme et al [8]. It yields that increasing the pulse duration had resulted in better surface roughness of the workpiece during machining process. Sushant Dhar et al [9]

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Electrochemical Micromachining of Inconel 625 Alloy for Performance Study

V. Subburam[1], S. Ramesh[2], P.N. Mohan Kumar[3] and A. Srinivasan[4]

[1,3]*Department of Mechanical Engineering, Paavai Engineering College, Namakkal–637018, India*
[2]*Department of Mechanical Engineering, KCG College of Technology, Chennai–600097, India*
[4]*Department of Mechanical Engineering, AVS Engineering College, Salem–636003, India*
E-mail: [1]v_subburam@yahoo.com, [2]ramesh_1968in@yahoo.com, [3]mohankm99@yahoo.com, [4]srivankumar14@gmail.com

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Overcut

ABSTRACT

Non- traditional machining techniques using chemical, electrical, thermal, electrochemical energies are finding applications in machining hard-to-machine metals and alloys, especially in the micromachining domain. Electrochemical Micromachining which can machine any electrically conductive material is one of the widely applied methods considering its many inherent favorable aspects. However applying electrochemical machining in the micromachining domain is a challenging task as it involves a lot of sensitive electrical, thermal, chemical and mechanical factors that could individually and also in combination impact the process capability. Research works are going on to bring it to economical scale and make it a commercially viable process in the micro domain. The present research work involves generating micro holes on a Inconel 625 alloy specimen using the micro-ECM setup designed and developed in-house for research purpose with a pulsed power supply. Inconel is a high strength, corrosion-resistant and hard alloy which finds application in various fields. The major process parameters like applied voltage, duty cycle and electrolyte concentration are taken as input parameters for investigation. A stainless steel, conical tipped tool is used as cathode and acidified sodium nitrate solution is used as electrolyte. The process parameters are varied at three different levels and the experimental design adopted is L9 Orthogonal Array of Taguchi design. The process capability is analysed by taking the Machining Rate (operational speed) and overcut as performance parameters. The influence of the process parameters over the response parameter and also the optimum combination of the selected parameters arrived from the calculations are reported.

1. Introduction

The advancements in the development of new materials for applications in various fields have warranted research work to explore their machinability under various techniques. More so in the micro-domain where machining is a difficult task as it involves the complexity of many influencing factors. Electrochemical machining process is gaining significance in the micro-domain due to its favourable output characteristics. When this process is employed in the micromachining limit (less than 1mm), it is referred to as micro-ECM or Electrochemical Micromachining (EMM). The micromachining potentials of EMM process have been experimentally investigated and the results were promising. Further research works have been suggested for continuous refinement of the process [1]. Micro-holes and micro-channels have been machined with high accuracy on a copper sheet with an insulated micro-tool revealing the capability of the process for mass production in industries [2].

Micro-holes have been machined on Hastelloy B-2 specimen, which is a highly corrosion resistant material using ultrashort voltage pulses through electrochemical setup combined with low cost electrical circuit. It has been determined that pulse duration is a major factor influencing the resolution of the process [3]. Biocompatible materials like Nickel-Titanium Alloys, better known as Shape Memory Alloys (SMAs) used in the medical field have also been micromachined under electrochemical micromachining process. using suitable electrolyte and ultrashort voltage pulses [4]. Experiments have been conducted to investigate the electrochemical machinability of titanium and nickel based alloys. The superalloys generally showed good electrochemical machining behavior. In case of Nickel alloys, the material having more fine grained microstructure showed better electrochemical machinability [5]. Through Electrochemical micromachining process copper alloy specimen has been micro-drilled and the input parameters such as voltage, duty ratio and electrolyte concentration have been optimized for better machining rate and lesser overcut [6].

The burn-resistant Ti40 titanium alloy has been electrochemically machined using a mixed electrolyte of NaCl and KBr which ensured the quality of the output parameters. The use of pulsed current improved the quality of surface finish compared to direct current. Further it is reported that electrochemical machining could be better utilized for machining difficult-to-machine materials [7].

The difficulty in achieving localized dissolution in electrochemical micromachining has been analysedand

Optimization of Machining Parameters in Electro Chemical Machining using Response Surface Method

Maniraj .S[1] Vijaya Raghavan .K[2] Sudharsan .S[3] Vijaybabu .K[4] Tamilmani .R[5]
[1]Assistant Professor
[1,2,3,4,5]Department of Mechanical Engineering
[1,2,3,4,5]Paavai Engineering College, Namakkal, India

Abstract— Non-conventional machining is increasing in importance due to some of the specific advantages which can be exploited during machining operation. Electrochemical machining (ECM) appears to be a promising technique, since in many areas of application, it offers several special advantages including higher machining rate, better precision and control, and a wider range of materials that can be machined. The present work is, therefore, initiated to investigate the influence of some predominant electrochemical process parameters such as applied voltage, electrolyte concentration, electrolyte flow rate and tool feed rate on the metal removal rate (MRR), and radial overcut(ROC) to fulfill the effective utilization of electrochemical machining of copper produced through stir casting. The contour plots are generated to study the effect of process parameters as well as their interactions. The process parameters are optimized based on Response Surface Methodology (RSM).

Key words: Metal Matrix Composites (MMC'S), Electrochemical Machining (EMM), Radial Overcut (ROC), Metal Removal Rate (MRR), Contour Plot

I. INTRODUCTION

Today needs of the society such as handy cell phones, palmtops, painless injection and any modern products require Micro hole as one of the basic elements. Several manufacturing processes are capable of meeting the requirements. Among these electro chemical micro machining (EMM) is desired because of its advantages such as no tool wear, higher MRR, better surface finish and others A simple table top electrochemical micromachining tool with microcontroller based Inter Electrode Gap (IEG) is used for such applications. Material removal techniques have a pivotal role to play in component fabrication.

In recent years many high strength alloys such as Stainless Steel and titanium alloys are produced that are extremely difficult to machine using the traditional processes. These alloys were developed for a variety of industries ranging from aerospace to medical engineering. The tool size and geometry limit, the final component shapes that can be machined. Problem with these tools is that they leads to notch on the machined surface. These notch are objectionable. For example, in medical industry the presence of even very small notch leads to damage the living tissues where these parts are used as implants. In electronic devices where a number of components are in close contact, the notch may lead to short circuits. In mechanical components notch may result in misfits.

A. Metal removal rate (MRR)

It is a ratio between the material removed to machining time.

B. Radial OverCut (ROC)

It means that the extra machined of the part over than the planned measurement.

II. RESPONSE SURFACE METHODOLOGY

Response surface methodology (RSM) approach is the procedure for determining the relationship between various process parameters with the various machining criteria and exploring the effect of these process parameters on the coupled responses, i.e., the material removal rate and radial overcut. This is done using the MINITAB18 software. We are using this to find the optimized value from the given parameters of the electrochemical machining (ECM).

The value can be assigned according to our conditions and the parameters are also choosen accordingly.

III. EXPERIMENTAL WORK

The test specimens of copper alloy were produced through stir casting. The dimensions of the specimens were 50mm in length and 40 mm in breadth and 0.4mm thick. The experiments were conducted on ECM equipment. The tool was made up of stainless steel with a circular cross section. Electrolyte was axially fed to the cutting zone through a central hole of the tool. The electrolyte used for experiment was fresh NaCl solution, because of the fact that NaCl electrolyte has no passivation effect on the surface of the job the machining has been carried out for fixed time interval. The observations were made by varying predominant process parameters such as applied voltage, electrolyte concentration, and duty cycle. The machined samples were examined using SEM for micro structural observations. MRR was measured from the weight loss. The radial overcut of the machined test specimens was measured using the formula (needle radius – hole radius).

IV. MATHEMATICAL MODELING

The mathematical relationship for correlating the metal removal rate and the considered process variables has been obtained as follows

$$MRR=-0.07940 - 0.02283\ X1 + 0.005327\ X2 + 0.001063\ X3 + 0.000363\ X1*X1 - 0.000024\ X2*X2 - 0.000129\ X3*X3 - 0.000067\ X1*X2 + 0.000777\ X1*X3 \quad (1)$$

The mathematical relationship for correlating the Radial over cut and the considered process variables has been obtained as follows:

$$Roc=-640.0 + 180.6\ X1 + 1.729\ X2 - 3.087\ X3 - 8.645\ X1*X1 - 0.06213\ X2*X2 + 0.6197\ X3*X3 + 0.6352\ X1*X2 - 3.208\ X1*X3 \quad (2)$$

x1 = Applied voltage(V)

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WIFI CONTROL ROBOT

S.Monish[1], S.Panner Selvam[1] , M.Perumal[1], R.Ranjith Kumar[1] , M.Ramesh [2], D.R.P.Rajarathnam[3],

[1]*Student, Department of Mechatronics, Paavai Engineering College, Namakkal , Tamilnadu, India*

[2]*Assistance Professor, Department of Mechatronics, Paavai Engineering College, Namakkal, Tamilnadu, India*

[3]*Associate Professor, Department of Mechatronics, Paavai Engineering College, Namakkal, Tamilnadu, India*

ABSTRACT

Robots are a staple on the modern society .Their application are far reaching and can encompass a variety of different machines. Nowadays robots are everywhere as a step ahead we entered into the custom robotics. There are many different types in custom robotics here we saw simple load carrying custom robot.It is a four wheel robot its connected with motors. Its four wheel drive robot. However to make the best use of robot. The behaviors of the robot needs to tailored to learning of object. Robot can carry a load above its weight. Thus we are going to make a custom bot is capable of moving in all areas by even caring a load of its own weight. They are used in the manufacturing industry to perform repetitive or difficult tasks.

KEYWORDS: *Arduino IDE, Node MCU, Motor Drive*.

1. INTRODUCTION

This robot is controlled by motor drive and node mc devices have transmitters and receivers to make the job. The transmitter (mobile hotshot) send the command to receivers. The input command are processed by components and jobs done by custom bot .Some also use the term industrial Internet interchangeably with IoT. Specialize in robotic solutions for the home with our snow removal robots, remote controlled lawnmowers and even a robotic cooler to provide you with refreshment and entertainment. In the military travel and operate in dangerous areas and in medical industry to assist in procedures.

2. NECESSITY OF THE PROJECT

Consideration for over all safety must be taken into account in order to reduce potential injuries. Since communication between the robot and the controller is wireless, robots can perform effectively. The new design must allow the robot to manipulate.

3. COMPONENT DESCRIPTION

3.1 PIN DIAGRAM OF NODE MCU (ESP 8266):

PNEUMATIC POWERED WALL CLIMBING ROBOT FOR DUST CLEANING PURPOSE IN A HIGH RISK BUILDING'S

[1]Parthiban C, [1]Ranjith R, [1]Kapilesh N, [1]Jayaraman K, [2]Rajarathnam D.R.P

[1]*UG Scholar, Mechatronics Engineering, Paavai Engineering College, Namakkal, India*

[2]*Associate Professor, Department of Mechatronics, Paavai Engineering College, India*

ABSTRACT

This Paper Presents a Wall Climbing Robot for Cleaning of Dust Particle in high risk buildings. The facade cleaning of high risk building by human operator is not safe. The development of a mobile robot which can move on the vertical or overhanging walls of tall buildings, on the side walls of ships etc., has been expected for a long time. The robot could then be utilized to carry rescue tools or does some other works instead of human. To increase operation efficiency and to protect human's we designed a wall climbing robot for cleaning application. The gripping is required to sustain the robot or to move it upwards on the wall. A magnetic force or vacuum pressure can be used to produce the fixing force on the walls and wheels or crawlers are available as parts of the moving mechanism on flat and wide vertical surfaces. A climbing robot with suction cup is more attractive since it can move on a large irregular surface. The microcontroller Atmega2560 is implemented for control application. While climbing in the vertical wall obstacle like windows opening, grills in the walls are detected by using the obstacle sensor.

KEYWORDS: *Atmega2560, vacuum cup, vacuum adhesion module, suction cup*

I.INTRODUCTION

The development of a mobile robot which can move on the vertical wall or inspection of oil tanks, maintenance of high risk building construction, surveillance on the side walls of ships, etc., has been expected for a long time. The robot could then be utilized to carry rescue tools or to do some other work instead of human. In order to realize this robot, frictional force to the wall, and wheels are crawlers are available as parts of the moving mechanism on flat and wide vertical surfaces.

A walking robot with suction cup is more attractive since it can move on a large irregular surface. Many combinations on these ideas can be developed for various applications in the near future. In this paper a suction cup with a vacuum pressure is created for climbing and locomotion. A small amount of air is sucked from the peripheral clearance of the cup, when it is moving on the wall, when the brush and/or flexible skirt are employed to prevent air flow at the periphery of the cup. To increase the operation efficiency and to protect human health and safety in hazardous tasks make the wall climbing robot a useful device. These system are mainly adopted in hazardous environment or need of scaffolding. The vacuum adhesion module will make the robot to seal the suction in smooth manner.

The climbing robot should be sucked to the surface on which is climbing safely and overcame its gravity. This is the first difference between a climbing robot and an ordinary walking robot on the ground. The wall climbing robot on safe and reliable attachment to the surface and they have ability of crossing obstacles. The system component of an automatic façade robot influence each other great deal and cannot be considered as independent parts. The following are key to all façade robots are independent of the building shape and façade type are

BOREWELL RESCUE ROBOT

[1]Rajarathnam D.R.P, [2] Lakshmi Raj Thilak R, [2]Rithvik K,[2] Vignesh G,
[2]Mohamed Marsook Hameed SH

[1]*AssociateProfessor, Department of Mechatronics Engineering, Paavai Engineering College , India*

[2]*UG Scholar, Mechatronics Engineering, Paavai Engineering College , Namakkal , India*

ABSTRACT : *The bore well accidents are now become common everywhere. Frequently we here news on child stuck in the bore well, some are being rescued and in some cases we lose to save the life of the child. The main objective of this project is to design and construct a portable robot which is cost effective, quick in action and accurate. The Bore well Rescue Robot is capable of moving inside the well and performs operations according to the user commands. The proposed model is designed to provide the child with two level of safety achieved by using robotic holding at the top and safety airbag at the bottom. This arrangement ensures that the child does not slip further deep during the rescue operation. The robot is operated by the human manually and monitor in computer .According to the observations made continuously using CCTV camera.*

KEYWORDS :*Robotic arm, circular disk, Airbag, IR device*

I. INTRODUCTION

Nowadays children falling in to the bore well seems common. Frequently we hear of news on children stuck in a bore well among various parts of India. In most of the cases of children falling into bore wells seem to occur in rural India. This says something about the bore well diameters. In the cities, bore wells are dug for domestic purposes. These are lesser in diameter. So looks like the bigger bore wells are the problem. Some manufacturing companies too dig large-diameter bore wells. These might be typically located in the villages.

However, this is not the primary reason - in the villages, people constantly seek groundwater. The moment a farm or company needs water , they try to dig a well. However, open wells are not always the solution (open wells are dug when you have groundwater available easily at shallow depths. Open wells are convenient. But then groundwater is not easily available - thus bore wells are due to a greater depth. Also companies need more water and wells won't suffice).

People need water and where does that come from? River or lake water supplies is not always available to all areas. Thus, groundwater is the source. And people dig to great depths to get groundwater. Groundwater for various reasons - summer, over exploitation, less recharge etc at times goes down deeper (water table).

However, many of the bore wells do not yield water and are "abandoned". The driller might have used casing and partially sealed the hole. Mostly, though the moment there is no water, the drillers pack up and leave. Vegetation takes over and these bore wells are forgotten.

Someday a child wanders over and falls. in. The diameter is enough for the child to fall in. However, it takes time to realize that the lost child could have fallen into the bore well.

The inside of the bore well now defunct or not used might have collapsed. Some bores are 300 feet deep (or more). The child might not always fall to the bottom but get stuck in the mud in between. This is not easy to find out as the hole is dark and deep. It is not a case of just pulling out the child through a vertical shaft.

So rescue operations begin and sometimes if the child is closer to the surface a rescuer gets in and pulls them out. However, if the child has fallen to greater depths, a camera is sent into the hole and then a parallel bore is dug. From there another

CENTRALIZATION AND MATCHING OF AN ELECTRONIC COMPONENTS AND SCHEMATICS USING ANDROID APPLICATION

M.C.ArjunGiridharan[1], I.Harish[1], D.Nishanth[1], G.Prem Anand[1], S.Rajesh Raja[2], D.R.P.Rajarathnam[3]

[1]*UG Scholar, Department Mechatronics Engineering, Paavai Engineering College, Tamil Nadu, India*

[2]*Assistant Professor, Dept of Mechatronics Engineering, Paavai Engineering College, Tamil Nadu, India*

[3]*Associate Professor, Dept of Mechatronics Engineering, Paavai Engineering College, Tamil Nadu, India*

Abstract

Our Project('ELECTROMATICS')which is an android application, is to provide a complete, full-fledged and centralized information of electronic components and providing a successful alternative for their characteristics. In addition to that of the objective we are focused on providing a complete and collective schematics of laptop motherboards. There is numerous application that are developed for providing an information of the components and finding a specific value. So, we are planned to develop the components information that are only published in the internet into a centralized specification. An information of finding some matching components are only come by experience of the circuit developer and obtaining those information by experimental test which would also be the part of the project. In this application, Electromatics focused on developing a certain spot collective information of MOSFET matching, Integrated Chips matching and Laptop board schematics.

Keywords: *Laptop Board Schematics, MOSFET Matching, IC (Integration Circuit) Matching.*

1. INTRODUCTION:

There have been a several applications that are developing and emerging in our life every day. These provide a comfort in our life in every aspect of it. In the event of providing a comfort to the Technicians, service engineers and circuit developers, we are providing this application to the next level of their comfort. Through this application we would like to solve one of the difficult problem i.e. (matching of transistor, MOSFET, IC chips and collection of datasheet of each and every component and finding the alternative to an optimum range) facing in the electronics field.

2. SOFTWARE PLATFORM USED:

2.1 Android Studio:

The platform which we used to develop an application is Android Studio. It is an open source integrated development environment which is an official for Google's Android operating system. It is built on JetBrain's IntelliJ IDEA software. It is designed especially for Android development. This is an user friendly platform which is common to all the course of user that means beginners, intermediate and professional. Now-a-days the several

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Smart Polyhouse Farming using IoT Environment

Raja. G
Assistant Professor, Department of Mechatronics Engineering, Paavai Engineering College, Salem, Tamil Nadu, India

Rajarathinam. D. R. P
Associate Professor, Department of Mechatronics Engineering, Paavai Engineering College, Salem, Tamil Nadu, India

Abhiraj. R, Arunkrishnan, Febin Malik, Jesu Jorof Divin. J
Department of Mechatronics Engineering,
Paavai Engineering College, Salem, Tamil Nadu, India

ABSTRACT

A Polyhouse is a building where plants are grown. Polyhouses are often used for growing flowers, vegetables, fruits, and tobacco plant. Basic factors affecting plant growth are sunlight, water content in soil, temperature, etc. These physical factors are hard to control manually inside a Polyhouse and a need for automated design arises. Automatically controlling all the factors that affect plant growth is also a difficult task as it is expensive and some physical factors are inter-related, for example, temperature and humidity are related in a way when temperature raises humidity reduces therefore controlling both together is difficult. Because the temperature and humidity of Polyhouse must be constantly monitored to ensure optimal conditions, a wireless sensor network can be used to gather the data from point to point. A graphical user interface (GUI) is unified for the ease of operations by the farming community. System also allows transmission of process parameters, including emergency alarm signals via e-mail client server or alternatively sending a SMS on a mobile phone. A conventional chat has also been integrated with the GUI to add vibrancy to inter-user communication. This feature can be embedded in upcoming 3G mobile technology. Simulations and video tutorials can also be integrated in the web server for teaching the farming community. Such integrated approach greatly widens the socio-economic possibilities for farmers through interaction with modern technological resources.

Keywords: *Graphical user interface, Polyhouse*

I. INTRODUCTION

In human activity, telecommunication and internet play very important role in day to day life. In modern society, no other technology has made such impact on communication. Web browser services form one of the core foundations of a successful information technology. Internet is information sharing technology. It not only sell product but also improves design engineering system, manufacture and test final product. Thus, to improve overall quality the balanced and justified usage of internet facilities is very important for reduction of design cycles. Last few decade, growth of mobile technology and internet increased exponentially. India is the large developing country. Here, internet services have been proven to be one of the most efficient systems to couple with mobile telephony. Mechanization and modernization of agriculture make considerable impact to infuse these two technologies. In India two-third of population is depend on agriculture. Agriculture uses 85% of available fresh water resources worldwide. Because of population growth and increased food demand, this percentage will continue to be dominant in water consumption.

GESTURE CONTROLLED CRANE USING ARDUINO MPU 6050

G.Abishek Maniraj[1], K.Kiran Kumar[1], J.Mithun Dass[1], G.Raja[2], D.R.P.Rajarathnam[3]

1UG Scholar, Department Mechatronics Engineering, Paavai Engineering College, Tamil Nadu, India
2Assistant Professor, Dept of Mechatronics Engineering, Paavai Engineering College, Tamil Nadu, India
3Associate Professor, Dept of Mechatronics Engineering, Paavai Engineering College, Tamil Nadu, India

ABSTRACT

In the context of further automation of manufacturing processes, automated transportation of heavy weights using cranes becomes more and more important. Applying the skills of robots to crane automation, a wide market of new applications could be developed. The crane hook represents the effectors of the robot. A load displacement system that have 5 Degrees OF Freedom(DOF) in a 3-Dimensional environment, which is controlled through Gestures of Hand and fingers Remotely for better Man-Machine interface, thereby improving the accuracy and control over the system. A wireless data glove was developed to control the crane remotely. This crane is a model for gesture controlled user interface (GCUI), and identifies trends in technology, application and usability. We present an integrated approach is real time detections, gesture based data which control vehicle movement and manipulation on gesture of the user using hand movements. A three-axis accelerometer is adaption. As the person moves their hand, the accelerometer also moves accordingly. The gesture is capture by accelerometer and processed by gesture. With each passing day the gap between machines and human are being reduced with the introduction of new technology. The future scope of advanced robotic arms that are designed like the human hand itself can easily controlled using hand gesture only. It is also having proposed utility in field of construction, medical science, hazardous waste disposal etc.

Keywords: *Gesture, crane, lifting mechanism, signal transmission.*

1. INTRODUCTION

Till now cranes are one of the most important systems for material handling of heavy goods. Although automatic cranes are comparatively rare in the industrial practice. Because of the high potential of rationalization, in the past several attempts have been made. But, several reasons prevented the success of such systems. Till now, one of these reasons is the relation between investment costs and achievable cost savings. But, due to decreasing investment costs because of lower prices for hard- and software as well as for actuators and sensors the profitability of such systems is within reach. Another reason is the broad application field of cranes with very different specific demands. This results in two main directions for crane manufacturers. One group, mainly larger company, offers the crane as a standardized product like a milling machine. The larger companies are interested in an automated crane as a standardized product. The first idea in crane automation was calculating time optimal control functions minimizing the traveling time of the crane considering the boundary conditions of no load swaying at the target point. They read the sensor signals and calculate the input variable motor torque or reference position for the actuators based on the time reference functions of the trajectory generation module. The addition of gesture based control for the overhead crane will lead material handling in all aspects to a whole new level of experience.

2. Crane

A crane is a type of machine, generally equipped with a hoist rope, wire ropes or chains, and sheaves, that can be used both to lift and lower materials and to move them horizontally. It is mainly used for lifting heavy things and transporting them to other places. The first known construction cranes were invented by the Ancient Greeks and

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OIL SPILLING ROBOT

Ashokkumar.V, Sabarinath.K.S , Vijayabalan.P.S , karthikeyan.G , Arunbabu.R , D.R.P.Rajarathinam

***Abstract*—** The researchers and oil companies are trying to take some precaution for the problem of oil spill in sea, river or on ground etc. A lot of work concerned by removing the oil from water, there are many advanced tools used for this task. Concept of this project is to clean oil spills in seashore and marine. The robot is operated and controlled by laptop and oil spill is cleanup monitoring using wireless camera. For about Five km can enable the periphery. Rising oil dumped in the sea towards the remote mode, the tool does apparent. We further use isolating device fitted to the tube, through which the oil can be carried. Through this mechanism 90 percent of the oil can be separated.

***Keywords* --** Arduino, Oil spill, sea shore, recovery, water, WIFI Module.

I. INTRODUCTION

Oil or "black gold" is still the largest source of power used by the industry sector. The demand for oil is increasing day-by-day and is substantiated by expanding submarine oil pipelines, distribution of oil and its derivatives by using tankers to carry it to many destinations. This leads to increased chances of oil leakage in the sea either by leakage from submarine oil pipelines or accidents with the tankers. In the past, such m is-happenings lead to major disasters of oil leakage in the high seas. Oil spills threaten the wildlife in the sea and hence, there is necessity for research on cleaning up oil spill quickly and efficiently has become very important issue by researchers and companies concerned.

Recovering oil from water may cost billions of dollars and take too much time. It can last for weeks and months. Many researchers and designers are concerned with how to recover the oil from water starting with the process of detecting and monitoring oil spills. The majority of oil spills (number of events) occur in coastal waters or in ports.

Therefore, contamination of the shoreline is likely at most spills, and thus the issues of oil recovery and shoreline cleanup must be addressed. Nearly all shoreline cleanup methods have some kind of environmental impact, so selection of a cleanup method inherently forces us to make some kind of tradeoff of the effects of the oil versus the effects of the cleanup. In this chapter, we describe some of the commonly used techniques for oil spill response and shoreline cleanup. The only really new techniques developed in the last few years involve chemical and biological treatment methods.

II. NECESSITY OF THE PROJECT

The leakage of oil in the sea is increasing day-by-day. It can last for over months and years. It threatens the organisms in the sea. So, it is necessary to clean up the oil spills quickly. So that it will not affect the marine organisms.

III. LITERATURE SURVEY

1) INTRODUCTION:

The literature review concentrates on different wireless technologies for an oil spill cleanup in the marine. There are average numbers of papers and they have been published in IEEE, IJETTCS, International seminar and many other journals.

2) LITERATURE REVIEW:

Emaad Mohamed H. Zahugi (2012) has proposed this paper describes an oil spill clean up the methods and technique concerned with removing the oil spill from water only but which is not an easy task as the spill usually gets stretched and spreads wider by passage of time. The only technology used to collect the oil spill is by using booms that are large floating barriers which round up the oil spill and then lift the oil off the water between two vessels.

This process takes much time and is expensive as vessels with large containers have to leave the place many times to dispose the recovered oil. In case the water is turbulent, the spill may get spread wider making

V.Ashokkumar, Mechatronics Engineering in Paavai Engineering College (Email : yuvihitman@gmail.com)
K.S.Sabarinath, Mechatronics Engineering in Paavai Engineering College (Email : sabariguy@gmail.com)
P.S.Vijayabalan, Mechatronics Engineering in Paavai Engineering College (Email : vijayhearty@gmail.com)
G.Karthikeyan, Mechatronics Entgineering in Paavai Engineering College (Email : karthikeyanmc@gmail.com)
R.Arunbabu, Assistant Professor, Mechatronics Engineering in Paavai Engineering College
D.R.P.Rajarathinam, Associate Professor, Mechatronics Engineering in Paavai Engineering College

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Raja. G
Assistant Professor, Department of Mechatronics Engineering, Paavai Engineering College, Salem, Tamil Nadu, India

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G.Abishek Maniraj[1], K.Kiran Kumar[1], J.Mithun Dass[1], G.Raja[2], D.R.P.Rajarathnam[3]

1UG Scholar, Department Mechatronics Engineering, Paavai Engineering College, Tamil Nadu, India
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3Associate Professor, Dept of Mechatronics Engineering, Paavai Engineering College, Tamil Nadu, India

ABSTRACT

In the context of further automation of manufacturing processes, automated transportation of heavy weights using cranes becomes more and more important. Applying the skills of robots to crane automation, a wide market of new applications could be developed. The crane hook represents the effectors of the robot. A load displacement system that have 5 Degrees OF Freedom(DOF) in a 3-Dimensional environment, which is controlled through Gestures of Hand and fingers Remotely for better Man-Machine interface, thereby improving the accuracy and control over the system. A wireless data glove was developed to control the crane remotely. This crane is a model for gesture controlled user interface (GCUI), and identifies trends in technology, application and usability. We present an integrated approach is real time detections, gesture based data which control vehicle movement and manipulation on gesture of the user using hand movements. A three-axis accelerometer is adaption. As the person moves their hand, the accelerometer also moves accordingly. The gesture is capture by accelerometer and processed by gesture. With each passing day the gap between machines and human are being reduced with the introduction of new technology. The future scope of advanced robotic arms that are designed like the human hand itself can easily controlled using hand gesture only. It is also having proposed utility in field of construction, medical science, hazardous waste disposal etc.

Keywords: *Gesture, crane, lifting mechanism, signal transmission.*

1. INTRODUCTION

Till now cranes are one of the most important systems for material handling of heavy goods. Although automatic cranes are comparatively rare in the industrial practice. Because of the high potential of rationalization, in the past several attempts have been made. But, several reasons prevented the success of such systems. Till now, one of these reasons is the relation between investment costs and achievable cost savings. But, due to decreasing investment costs because of lower prices for hard- and software as well as for actuators and sensors the profitability of such systems is within reach. Another reason is the broad application field of cranes with very different specific demands. This results in two main directions for crane manufacturers. One group, mainly larger company, offers the crane as a standardized product like a milling machine. The larger companies are interested in an automated crane as a standardized product. The first idea in crane automation was calculating time optimal control functions minimizing the traveling time of the crane considering the boundary conditions of no load swaying at the target point. They read the sensor signals and calculate the input variable motor torque or reference position for the actuators based on the time reference functions of the trajectory generation module. The addition of gesture based control for the overhead crane will lead material handling in all aspects to a whole new level of experience.

2. Crane

A crane is a type of machine, generally equipped with a hoist rope, wire ropes or chains, and sheaves, that can be used both to lift and lower materials and to move them horizontally. It is mainly used for lifting heavy things and transporting them to other places. The first known construction cranes were invented by the Ancient Greeks and

CENTRALIZATION AND MATCHING OF AN ELECTRONIC COMPONENTS AND SCHEMATICS USING ANDROID APPLICATION

M.C.ArjunGiridharan[1], I.Harish[1], D.Nishanth[1], G.Prem Anand[1], S.Rajesh Raja[2], D.R.P.Rajarathnam[3]

[1]*UG Scholar, Department Mechatronics Engineering, Paavai Engineering College, Tamil Nadu, India*

[2]*Assistant Professor, Dept of Mechatronics Engineering, Paavai Engineering College, Tamil Nadu, India*

[3]*Associate Professor, Dept of Mechatronics Engineering, Paavai Engineering College, Tamil Nadu, India*

Abstract

Our Project('ELECTROMATICS')which is an android application, is to provide a complete, full-fledged and centralized information of electronic components and providing a successful alternative for their characteristics. In addition to that of the objective we are focused on providing a complete and collective schematics of laptop motherboards. There is numerous application that are developed for providing an information of the components and finding a specific value. So, we are planned to develop the components information that are only published in the internet into a centralized specification. An information of finding some matching components are only come by experience of the circuit developer and obtaining those information by experimental test which would also be the part of the project. In this application, Electromatics focused on developing a certain spot collective information of MOSFET matching, Integrated Chips matching and Laptop board schematics.

Keywords: *Laptop Board Schematics, MOSFET Matching, IC (Integration Circuit) Matching.*

1. INTRODUCTION:

There have been a several applications that are developing and emerging in our life every day. These provide a comfort in our life in every aspect of it. In the event of providing a comfort to the Technicians, service engineers and circuit developers, we are providing this application to the next level of their comfort. Through this application we would like to solve one of the difficult problem i.e. (matching of transistor, MOSFET, IC chips and collection of datasheet of each and every component and finding the alternative to an optimum range) facing in the electronics field.

2. SOFTWARE PLATFORM USED:

2.1 Android Studio:

The platform which we used to develop an application is Android Studio. It is an open source integrated development environment which is an official for Google's Android operating system. It is built on JetBrain's IntelliJ IDEA software. It is designed especially for Android development. This is an user friendly platform which is common to all the course of user that means beginners, intermediate and professional. Now-a-days the several

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Design of Power Drive Asscender for Highly Inclined Terrains

S. Mohankumar[1], V. K. Gobinath[1], D. R. P. Rajarathnam[1], S. R. Feri Abishek[2], M. Kanaga Manikandan[2], N. Kodiyarasan[2], K. K. Narjas[2]

[1]Assistant Professor, [2] U.G Scholar
[1,2]Department of Mechatronics Engineering, Paavai Engineering College, Namakkal. Tamil Nadu, India

ABSTRACT

This paper relates to a design that involves driving a four wheeled vehicle in highly graded planes. The primary use of the design discussed in this paper is to allow four wheeled rovers to climb highly inclined terrain and have a suspension system in place to provide frictional force for the wheels to come down and provide traction over the ground. Such a design allows the rover to travel unmapped terrain.
Keywords:Power Drive Asscender; Inclined terrarin; High Torque Motors; Four Wheel Drive

I. INTRODUCTION

Mobile robots, or Rovers play a significant role to increase our explore in current and future surveillance missions. To achieve advanced mission goals, rovers are expected to travel much longer distance over more challenging terrains and perform more complex rescue tasks. Corresponding to such growing attention, there are an increasing number of research activities conducted in various institutions.

Recently, intensive research has been made on a physics based design that involves traction mechanics between the wheel and terrain. This approach recalls a classical terra-mechanics design then successfully applies it to simulate, plan and control the rover motion for improved performance developed a non-line method to identify terra-mechanic parameters of plane.

II. METHODS AND MATERIAL

1. Comparison Factor

A. Terrain Capabilities

Terrain capabilities refer to ability of the robot to traverse on various type of terrain such as flat ground, grassland and rubble, and to overcome obstacles such as step, ramp, ditch and staircase. In comparison, legged robots will have the best abilities followed by re-configurable robots; both types of robots are able to traverse on the various types of terrain and overcome most of the obstacles. Tracked robots have the ability to traverse in most terrain but unable to overcome most obstacles. However, with the addition of one or two pairs of articulated tracks, they are able to traverse on most terrain and overcome most obstacles. Wheeled robots only have the ability to traverse on flat terrain.

B. Stability

Stability is the ability of the robot to remain controllable during movement or obstacle negotiation and it is usually related to the contact area of the robot to the terrain. Better stability means that the robot has lower risk to be overturned or trapped by obstacle, it allows more payloads that can be carried by the robot. Tracked robots have excellent stability while wheeled robots have good stability due to their large contact area to the terrain. Similarly, re-configurable robots have moderate stability while legged robots have poor stability.

2. System Configuration

The robot is made up of four main sub-systems, the vehicle platform, the vehicle electronics, the mission command console and the various modular payloads.

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Development of A Hand Motion Controlled Robotic Arm

V.K. Gobinath[1], S. Mohankumar[1], D.R.P. Rajarathnam[1], K. Santhoshkumar[2], T. Suresh kumar[2], D. Veeramani[2], G.Marimuthu[2]

Assistant professor, Dept. of Mechatronics, Paavai Engineering College, Namakkal, Tamil Nadu, India[1]

UG Student, Dept. of Mechatronics, Paavai Engineering College, Namakkal, Tamil Nadu, India[2]

ABSTRACT: The system allows controlling a robotic arm by hand movements. The system uses RF receiver which is interfaced to the 8051 microcontroller which controls the driver IC which is responsible to control the moving of the arm. The transmitter circuit contained an accelerometer sensor which is interfaced to the AT mega microcontroller. The transmitter circuit sends commands to the receiver circuit. That the commands indicate whether to move the robotic arm in upward or downward direction or whether the commands indicates to grip an object or release it.

KEYWORDS: Robot arm, Hand motion, signal processor, driver circuit.

I.INTRODUCTION

An Embedded System is a combination of both hardware, software, and perhaps additional mechanical or other parts, designed to perform a specific function. An embedded system is a microcontroller-based, software driven or human or network interactive, operating on diverse physical variables and in diverse environments and sold into a competitive and cost conscious market.An embedded system is used primarily for processing, not a software system on Personal computer, not a traditional business or scientific applications. High-end embedded system – Generally 32, 64 Bit microcontrollers used with OS. Example Personal Digital Assistant and Mobile phones, camera etc. Lower end embedded systems - Generally 8, 16 Bit microcontrollers used with an minute operating systems and hardware layout designed for the specific purposes.

II. METHODOLOGY

This project uses a 6V battery for power supply. A diode is used to get about 5V DC supply. One LED is connected of this 5V point in series with a resistor of 330Ω to the ground i.e., negative voltage to indicate 5V power supply availability. ATMEL series of 8051 family of microcontroller contain standard connectors. The actual number of the Microcontroller could be 89C51, 89C52, 89S51, 89S52. The 4 set of I/O ports are used based on the project requirement. Every microcontrollers that requires a timing reference for its internal program executor therefore an oscillators that need to be the functional with a desired frequency to obtain that the timing reference as t =1/f.Pin no 9 is provides with an re-set arranged by a combinatory of an electrolytic capacitor and a register forming RC timer constant. At the time of the switch on, the capacitors gets charged, and it behavior as a full short circuits from the positive to the pin number 9. After the capacitors that gets fully charged the current stops flowing and pin number 9 go to low which is pulled down by a 10k resistors to the ground level. This arrangement of reset at pin number 9 going high initially and then to logic 0 i.e., low helps the program which executes to start from the beginning level.Pin no 31 of 40 pin 8051 microcontrollers that termed as EA^{-} is required to be connected to 5V for accessing the programmable form that the on-chip program memory. If it is connected to the ground then the controller accessed the programs from external memory. However it will be using the internal memory it is always connected to +5V.

L293D has 2 set of arrangement where one set have the input 1, input 2, output 1 and output 2 and other set have input 3, input 4, output 3 and output 4, according to the block diagrams if pin no 2 & 7 are high then pin no 3 & 6 are also high. If enable 1 and pin number 2 has high leaving pin number 7 as the lower then the motor rotates in forward direction. If enable 2 and pin number 10 are high leaving pin number 15 as lower than the motor rotates in the forward

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Design of Employee Attendance Monitoring System by Using Radio Frequency Identity Cards

S. Mohankumar[1], V.K. Gobinath[1], D.R.P. Rajarathnam [1], B.Tamil Selvan[2], M.Prem Kumar[2], K.Ajith Kumar[2], J.Sanjai Chandran[2]
[1]Assistant Professor, [2]U.G scholar
Department of Mechatronics Engineering, Paavai Engineering College, Namakkal– 637 018, Tamil Nadu, India.

Abstract: *Nowadays, there have been ascent in the number of usages based on Radio Frequency Identification (RFID) systems. The RFID system have been successfully applied to different areas transportation, medical, agriculture, and industrial to name a few. RFID technology facilitates automatic wireless identification using ID tags and reader method. In our project RFID cards are used to denote members are present in class at the time. In RFID cards are having the magnetic coil which gives the Radio frequency to the reader. After reading coil's frequency it stores the attendance to the computer. A microcontroller (also MCU or μC) is a functional computer system-on-a-chip. It includes a processor core, memory, and programmable input/output peripherals. Microcontrollers restrain an integrated CPU, memory and capable of input and output. Microcontrollers are used in automatically controlled products and devices, which is automobile engine control systems, remote controls, office machines, appliances, power tools, and toys.*

Keywords: *RFID, Attendance, Passive tag, Reader module.*

1. Introduction

The emergence of electronic prototype for learning compared to older method and availability of almost all information on the information superhighway(Internet), in recently have caused students to be less motivated to come to the lecture halls than ever before. Lazy habit on the part of students, disregard to school work, extra social activities that have no priority in aiding the mission of the institution and a lot more, may prevent students from attending lectures. Sequence to these, lecturers and administrators in developing countries have to come up with ways to establish a healthy participation from students, and make that the student-lecturer interactive relationship is kept intact. In some cases, have come in simple forms such that roll calls, while in more interesting cases, can be formats like surprise quizzes, extra credit in class, etc. These strategies are however time consuming, stressful and laborious because the valuable lecture time that could be used for lectures is dedicated to student attendance taking and sometimes inaccurate. Despite of all these challenges, the attendances are recorded manually by the tutor and therefore are exposed to personal errors. There ascent a need for a more efficient and effective method of resolve this problem.

1. Experimental Set-Up & Experimentation

The developed Attendance monitoring system (ALC) comprises the following systems.

- Microcontroller.
- LCD Display.
- RF Reader.
- RFID Cards.
- Programming Software.
- Power Supply.

2.1. Microcontroller 8051/8052

A microcontroller (also MCU or μC) is a functional computer system-on-a-chip. It contains a processor core, memory, and programmable input/output peripherals. In addition to the usual arithmetic and logic elements of a general purpose microprocessor, the microcontroller integrates additional elements such as read-write memory for data storage, read-only memory for program storage, Flash memory for permanent data storage, peripherals, and input/output interfaces. At clock speeds of as little as 32 KHz, microcontrollers often operate at very low speed compared to microprocessors, but this is adequate for typical applications. Microcontrollers are used in

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INVESTIGATION OF THE WEAR BEHAVIOUR OF AN AISI 1040 FORGED STEEL SHAFT WITH PLASMA-SPRAY CERAMIC-OXIDE COATINGS FOR SUGAR-CANE MILLS

RAZISKAVA OBRABE AISI 1040 KOVANE JEKLENE GREDI S KERAMIČNIMI OKSIDNIMI PREVLEKAMI ZA MLINE ZA MLETJE SLADKORNEGA TRSA

Duraisamy Revathi Ponnusamy Rajarathnam[1], Murugesan Jayaraman[2]

[1]Paavai Engineering College, Department of Mechanical Engineering, Namakkal District, India
[2]Velalar College of Engineering and Technology, Department of Mechanical Engineering, Erode District, India
drprajamalathi@yahoo.co.in

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In this investigation, ceramic oxide powders, alumina, titania, chromia, alumina-titania, alumina-chromia and titania-chromia, were coated for a thickness of 200 μm on an AISI 1040 forged steel substrate by means of an atmospheric plasma spraying method. Ni-Cr was used as an intermediate bond coat of thickness 20 μm over the substrate to improve the coating adhesion. Pin-on-disc apparatus was employed for a dry wear test as per the American Society for Testing and Materials G99 standards for a constant load of 10 N, at different sliding distances of 1000 m, 2000 m and 3000 m, respectively. The investigation shows that the microstructure, coating thickness, porosity, surface roughness and hardness influence the wear rate. Before and after the wear tests, surface roughness measurements were carried out by using a talysurf instrument on the specimens. It is shown that the highest value (20.89 μm) was obtained for the coating of alumina-titania. The practical results show that the pure chromia coated specimen has a very good wear-resistance property compared to the ceramic oxides. This suggests that surface coating with pure chromia on the top mill roll shaft of sugar industries enhanced the wear resistance.

Keywords: alumina, titania, chromia, atmospheric plasma spray, pin-on-disc, wear, Talysurf profilometer

V raziskavi so bili oksidni praški: glinica, titan, krom, aluminijev oksid, aluminij-krom, prevlečeni z 200 μm na AISI 1040 podlago kovanega jekla z metodo napršev anja s plazmo. Ni-Cr smo uporabili kot vmesni vezni premaz z debelino 20 μm nad podlago za izboljšanje oprijemljivosti prevleke. Pin-on-disk aparat je bila uporabljen za preskus suhe obrabe, v skladu s standardi G99 Ameriškega združenja za testiranje in materiale, s konstantno obremenitvijo 10 N, na različnih drsnih razdaljah 1000 m, 2000 m in 3000 m. Preiskava je pokazala, da so mikrostruktura, debelina prevleke, poroznost, površinska hrapavost in trdota vplivali na stopnjo obrabe. Pred in po testih obrabe, so bile meritve vzorcev površinske hrapavosti izvedene z uporabo Talysurf instrumenta. Izkazalo se je, da je največja vrednost (20,89 μm), pridobljena s prevleko iz aluminijevega oksida-titanovega dioksida. Praktični rezultati kažejo, da ima s čistim kromom prevlečen vzorec zelo dobro odpornost na obrabo kot tisti s keramičnimi oksidi. Kaže, da površinska prevleka s čistim kromom na zgornji gredi mlina v sladkorni industriji poveča odpornost proti obrabi.

Ključne besede: aluminij, titan, krom, atmoferski plazma sprej, spoj na disk, obraba, Talysurf profilometer

1 INTRODUCTION

In many sugar industries, the top mill roller shaft, used to crush sugarcane, is made up of AISI 1040 forged carbon steel as this medium carbon, tensile steel shows good strength, toughness and wear resistance. The roller shaft has to operate under critical working conditions such as heavy load, high speed, temperature and chemical environment, while it crushes the raw sugar cane to extract the sugar cane juice. Hence, surface hardening of the shaft is a must to improve the wear resistance as they suffer from various types of degradation. Generally, the shaft diameter will decrease due to continuous rotation with a speed of 4 min^{-1} and accumulation of various impurities such as bagasse, ferrous and non-ferrous metals and also due to improper lubrications in between the journal bearing and the shaft. Hence, the shaft surface at the pinion end should be coated with ceramic materials with a good wear-resistance property.

The coating layer is very important because it enhances the wear resistance of the metal substrate of AISI 1040 forged steel to increase its life and efficiency. Some of the most commonly used ceramic materials in industrial applications are alumina (Al_2O_3), titania (TiO_2), Chromia (Cr_2O_3). S.-H. Yao[1] studied nanostructured Al_2O_3 with 13 % of mass fractions of TiO_2 coatings and found that they showed better performance in hardness and wear. Y. Sert et al.[2] studied the wear resistance of the plasma sprayed alumina – titania, titania, chromia and chromia – titania and found the effect of TiO_2 content on Al_2O_3–TiO_2 and Cr_2O_3–TiO_2 coatings on Al-based substrate, and concluded that hardness, coating density and wear resistance changed with the TiO_2 content.

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AVOID PARKING IN NO PARKING AREAS

V.K. Gobinath [1], S. Mohankumar [2], D.R.P. Rajarathnam [3], S.Rajesh Raja[4]
Assistant Professor, Department of Mechatronics Engineering,Paavai Engineering College, Namakkal– 637 018, Tamil Nadu, India.
[1] gobinath.v.k@gmail.com

ABSTRACT

Now a day people are parking their vehicle in the no parking area like in front of government office, pedestrians, schools, hospitals, bus stops, department stores, theatres, multi complex, shopping malls and in rush roads also. They are very uncomfortable for people to walk on no parking areas and also make the public mishap. It takes too much of time to move. So we use the Radio frequency(RF) transmitter and radio frequency(RF) receiver to clear that issues by keep the ignition of vehicle can't be shut down by Programmable interface controller IC 16F676.

The radio frequency transmitter is fixed in the no parking area and the radio frequency receiver is attached to vehicle with the Programmable interface controller IC 16F676. and also the relay controller for vehicle engines. The RF transmitter send the signal of radio frequency of 450mhz at the particular area of no parking area. The radio frequency receiver receive the signal from the transmitter and send the signal to the Programmable interface controller IC 16F676 to control the vehicle i.e can't shut down the vehicle using relay.

Keywords: ***PIC Controller, RF Transmitter, RF Receiver.***

1. INTRODUCTION:

Present production is progressively shifting towards automation. In our system we are going to present the little bit of automations in automobiles. For our system PIC microcontroller plays a main roll. It act as a brain of our system. For every controlling unit we must need some sensing unit to sense the input or any data given by the mankind. So we use the RF transmitter and receiver as sensing unit for this project. The basic working of our project is implanting the RF transmitter in the no parking area and the RF receiver in our vehicles. In the no parking zone RF transmitter always transmitting the radio frequency signals in that particular area which are the first setup of our project. In the second setup of our project is in the vehicle that contains RF receiver which is connected with programmable interface controller (PIC). The controller create the control signal depend upon the input signal of RF receiver. By that control signal the working of relay controlled which is connected with the ignition system of the engine. By this king of innovation we only change the small things in our daily activities but it make a big difference in everybody daily life.

2. BRIEF METHODLOGY:

This project consists of

- PIC Micro-Controller
- AC to DC Step down transformer
- 5V regulator
- RF Transmitter and receiver
- Relay

Tribomechanical behavior of B_4C_p reinforced Al 359 composites

Debasignamani Ramasamy, Mohan Kumar Subramanian, Gokinath Velu Kuliyarasan, Jayanth Dattatreyi, Rajasekar Rathinasamy, Tamil Nadu and Saffeth Kumar Palaniappan, West Bengal, India

Article Information

Correspondence Address
Dr. Rathinasamy Rajasekar
Department of Mechanical Engineering
Kongu Engineering College
Perundurai, Erode
638001, Tamil Nadu, India
Email: rajasekar.r@kongu.com

Keywords
Aluminium metal matrix composite, B_4C_p particles, stir casting, wear

In the present investigation, the influence of B_4C_p particles on the mechanical and tribological behavior of Al 359 composites has been studied. B_4C_p particle reinforced Al 359 composite samples were prepared by stir casting process. Hardness, tensile strength and wear behavior of the composites were studied and compared with a control specimen. Hardness of B_4C_p particles reinforced Al 359 matrix increases compared to base matrix due to the presence of the ceramic phase. Coefficient of friction considerably increases with up to 20 wt. % addition of B_4C_p in base matrix. Specimens were subjected to wear tests under different load conditions and the following five different wear mechanisms such as wear groove, abrasion, delamination, oxidation and plastic deformation were evaluated. The abrasion results prove the increase in wear resistance of B_4C_p reinforced composites compared to a control specimen.

Composite materials have economically replaced traditional material in several light weight and high strength applications. The strength of composite materials depends upon the type and content of particle or fiber reinforcement in the matrix [1].

In the recent years, all over the world, different automobile manufacturers have been focusing on novel wear resistance materials and replacement of cast iron by aluminium [2] metal matrix composites (MMCs) for braking applications [3]. Al composites reinforced with boron carbide (B_4C_p) particles had been studied by few researchers. Research reports depict high thermal conductivity, low wear rate, high specific heat capacity and low density for Al composites compared to conventional cast iron [3-5]. Incorporation of 20 vol. % of silicon carbide (SiC) particles in Al 359 composites enhances the resistance to wear in dry sliding condition [6, 7]. The wear behavior of Al 356 composite containing 15 vol. % SiC particles had been analyzed and compared with conventional cast iron brakes. Al 356-15 composite depicts high wear resistance compared to cast iron under different sliding conditions [8, 9].

The aim of present study is to investigate the tribological characteristics of sand cast Al 359-B_4C_p composites using pin-on-disc apparatus under dry sliding condition. The effect of sliding velocity and applied load on wear rate and friction coefficient has been studied. Sand cast brake rotor made of Al 359-B_4C_p composites were manufactured by adopting stir casting technique. The influence of varying load ranges (10 N, 20 N, 40 N, 60 N) and sliding speed ranges (1.57 m s^{-1}, 3.14 m s^{-1}, 4.71 m s^{-1}) on the tribological behavior of Al 359/B_4C_p metal matrix composite has been investigated.

Experimental procedure

Fabrication of composites. In the present work, a commercial grade aluminium alloy Al 359 has been used as the base matrix and B_4C_p particles as reinforcement. Al composites had been developed with varying content (5, 10, 15, 20 and 25 wt.-%) of B_4C_p particles addition. The chemical composition of Al 359 is shown in Table 1. MMCs are generally produced by liquid metallurgy route (LMR) or powder metallurgy technique (PMT). In LMR, the particulate phases are mechanically dispersed in the liquid phase before solidification of the melt phase. Stir casting technique is one of the popular economical LMR methods. The suitable selection of process parameters like stirring speed, pouring temperature and pre-heat temperature of reinforcement can produce good quality composites.

In the present work, stir casting technique was adopted for the preparation of Al alloy Al 359 with varying content (5, 10, 15, 20 and 25 wt. %) of B_4C_p. The stir casting setup is shown in Figure 1a. The temperature of the furnace was measured and controlled to achieve homogeneous distribution of B_4C_p particles with base matrix. Two thermocouples and a PID controller were used for this purpose. Mild steel material was selected as stirrer rod and impeller. This stirrer rod was connected to 1 horse power direct current motor through

TABLE 1: Chemical composition of the Al 359 alloy

Alloy	Si	Cu	Mg	Mn	Zn	Ti	Fe	Al
	in wt.-%							
Al 359	8.5-9.5	0.20	0.5-0.7	0.10	0.10	0.20	0.2	Balance

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Design of Employee Attendance Monitoring System by Using Radio Frequency Identity Cards

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[1]Assistant Professor, [2]U.G scholar
Department of Mechatronics Engineering, Paavai Engineering College, Namakkal– 637 018, Tamil Nadu, India.

Abstract: *Nowadays, there have been ascent in the number of usages based on Radio Frequency Identification (RFID) systems. The RFID system have been successfully applied to different areas transportation, medical, agriculture, and industrial to name a few. RFID technology facilitates automatic wireless identification using ID tags and reader method. In our project RFID cards are used to denote members are present in class at the time. In RFID cards are having the magnetic coil which gives the Radio frequency to the reader. After reading coil's frequency it stores the attendance to the computer. A microcontroller (also MCU or μC) is a functional computer system-on-a-chip. It includes a processor core, memory, and programmable input/output peripherals. Microcontrollers restrain an integrated CPU, memory and capable of input and output. Microcontrollers are used in automatically controlled products and devices, which is automobile engine control systems, remote controls, office machines, appliances, power tools, and toys.*

Keywords: *RFID, Attendance, Passive tag, Reader module.*

1. Introduction

The emergence of electronic prototype for learning compared to older method and availability of almost all information on the information superhighway(Internet), in recently have caused students to be less motivated to come to the lecture halls than ever before. Lazy habit on the part of students, disregard to school work, extra social activities that have no priority in aiding the mission of the institution and a lot more, may prevent students from attending lectures. Sequence to these, lecturers and administrators in developing countries have to come up with ways to establish a healthy participation from students, and make that the student-lecturer interactive relationship is kept intact. In some cases, have come in simple forms such that roll calls, while in more interesting cases, can be formats like surprise quizzes, extra credit in class, etc. These strategies are however time consuming, stressful and laborious because the valuable lecture time that could be used for lectures is dedicated to student attendance taking and sometimes inaccurate. Despite of all these challenges, the attendances are recorded manually by the tutor and therefore are exposed to personal errors. There ascent a need for a more efficient and effective method of resolve this problem.

1. Experimental Set-Up & Experimentation

The developed Attendance monitoring system (ALC) comprises the following systems.

- Microcontroller.
- LCD Display.
- RF Reader.
- RFID Cards.
- Programming Software.
- Power Supply.

2.1. Microcontroller 8051/8052

A microcontroller (also MCU or μC) is a functional computer system-on-a-chip. It contains a processor core, memory, and programmable input/output peripherals. In addition to the usual arithmetic and logic elements of a general purpose microprocessor, the microcontroller integrates additional elements such as read-write memory for data storage, read-only memory for program storage, Flash memory for permanent data storage, peripherals, and input/output interfaces. At clock speeds of as little as 32 KHz, microcontrollers often operate at very low speed compared to microprocessors, but this is adequate for typical applications. Microcontrollers are used in

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Design of Employee Attendance Monitoring System by Using Radio Frequency Identity Cards

S. Mohankumar[1], V.K. Gobinath[1], D.R.P. Rajarathnam [1], B.Tamil Selvan[2], M.Prem Kumar[2], K.Ajith Kumar[2], J.Sanjai Chandran[2]
[1]Assistant Professor, [2]U.G scholar
Department of Mechatronics Engineering, Paavai Engineering College, Namakkal– 637 018, Tamil Nadu, India.

Abstract: *Nowadays, there have been ascent in the number of usages based on Radio Frequency Identification (RFID) systems. The RFID system have been successfully applied to different areas transportation, medical, agriculture, and industrial to name a few. RFID technology facilitates automatic wireless identification using ID tags and reader method. In our project RFID cards are used to denote members are present in class at the time. In RFID cards are having the magnetic coil which gives the Radio frequency to the reader. After reading coil's frequency it stores the attendance to the computer. A microcontroller (also MCU or μC) is a functional computer system-on-a-chip. It includes a processor core, memory, and programmable input/output peripherals. Microcontrollers restrain an integrated CPU, memory and capable of input and output. Microcontrollers are used in automatically controlled products and devices, which is automobile engine control systems, remote controls, office machines, appliances, power tools, and toys.*

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1. Introduction

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Sequence Prediction of Firing Angle Bldc Motor Drive using Lookup Table

Murugesan. D*
Assistant Professor, Department of Electrical and Electronics Engineering, Paavai Engineering College, Salem, India

Karthikeyan. M
Department of Electrical and Electronics Engineering, Paavai Engineering College Salem, India

Loganathan. M
Department of Electrical and Electronics Engineering, Paavai Engineering College Salem, India

ABSTRACT

Brushless DC motors are also called electric switching motors. This is because the switching process is entirely done by electronic control and not mechanically. Typical brushless DC motors use a permanent magnet rotating in the rotor and a fixed electric magnet / coil on the motor housing for the stator. However, sometimes the motor housing may be the permanent magnet rotor and surround the electrical winding in the stator. This type of engine configuration is called an output engine, unlike the previous configuration which is a runner. The configuration of the output wheel allows a higher torque while the freewheel has higher rotational capacities. A lookup table for voltage selection has been designed to provide a faster torque response. Steering control and speed control also developed.

Keywords: *bldc, three phase inverter, look up table, hall effect sensor.*

1. INTRODUCTION

BLDC motors, also known as permanent magnet synchronous motors, are one of the fastest growing engines, mainly because of their better characteristics and performance. These motors are used in a large number of industrial sectors because their architecture is suitable for all safety-critical applications.

DC motors (BLDC motors, BL motors) are synchronous electric motors powered by direct current (DC) and equipped with electronic switching systems rather than mechanical switches and brushes. The current-torque and voltage-speed relationships of BLDC motors are linear. BLDC motors can be described as stepper motors, with fixed permanent magnets and possibly more poles on the stator than the rotor, or reluctance motors. The latter may be devoid of permanent magnets, only poles induced on the rotor and then aligned by timed stator windings. However, the term stepper motor tends to be used for motors which are specifically designed to operate in a mode where they are frequently stopped with the rotor in a defined angular position; this page describes more general BLDC driving principles, although there is overlap.

Maximum torque: - Brushed DC motors have been used commercially since 1886. However, BLDC motors have been commercially available only since 1962. The limitations of DC motors brushed by BLDC motors include lower overall efficiency and sensitivity. switch to mechanical wear and therefore a need for maintenance, at the cost of less complex and less complex operation. expensive electronic control. BLDC motors develop maximum torque when they are stationary and have linear decreasing torque with increasing speed as shown in the adjacent figure. High torque to weight ratio: - BLDC engines are currently the most popular engine for model helicopters. Their favorable power to weight ratios and a wide range of available sizes, from less than 5 grams to large engines rated at thousands of watts, have revolutionized the electric model flight market. Their introduction redefined the performance of model aircraft and electric helicopters, moving virtually all

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A Novel Approach: An Advanced Security Mechanism for Sending Messages using Steganography

R. Jayavadivel
Assistant Professor, Department of IT,Paavai Engineering College, Namakkal, Tamilnadu, India

B. Prabhushankar
Associate Professor, Department of IT, Paavai Engineering College, Namakkal, Tamilnadu, India

S.Rajesh
Associate Professor,Department of CSE, Paavai Engineering College, Namakkal, Tamilnadu, India

ABSTRACT

Steganography is the art of concealing information in ways that prevents the detection of hidden messages. Providing security for sending messages and confidential information via internet has been a challenging task for ages. Steganography provides a method to hide the data inside an image called cover object, while communication takes place between the sender and the receiver. Several techniques have been developed by the researchers to provide secured transmission of data. Hiding text messages inside an image using various methods in steganography is one of them. In this paper, we have proposed a new technique of file steganography and audio steganography. Here, the image and audio files are used as the carrier medium which adds another step in security. Only encrypted data is embedded in the image or audio file. Therefore, the intruders cannot access the original data from cover object as it will be available only in its encrypted form.

Keywords: *Cryptography, Steganography, LSB, Hash-LSB, RSA Encryption –Decryption, Low bit encoding*

I. INTRODUCTION

In today's information technology era, the internet has become an essential part for communication and information sharing. The number of data exchange has been increasing and therefore it is important to ensure the secure transmission of data between the sender and receiver.

Cryptography is a technique that deals with the science of coding and decoding secret messages, with the help of various encryption and decryption algorithms, integrity check functions and digital signature schemes.

Another technique called, Steganography that deals with the methods of hiding or covering secret and confidential data within other data or files.

The steganography can be used to hide objects such as:

a. Text
b. Image
c. Audio/video

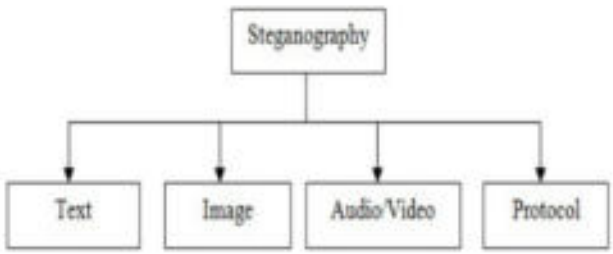
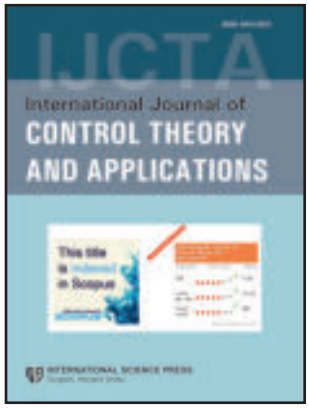


Figure 1: Steganography

Almost all digital file formats can be used for steganography, but the formats that are more suitable are those with a high degree of redundancy. Redundancy can be defined as the bits of an object that provide accuracy far greater than necessary for the object's use and display [6]. Because of this property, the alterations in the cover object is done



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Improved Quality of Service (QoS) in Video Streaming LTE Networks using PID Controller and Exhaustive Search Mechanism

R. Jayavadivel[a] and J. Sundararajan[b]

[a]*Assistant Professor, Department of Information Technology, Paavai Engineering College, Pachal, Namakkal, Tamilnadu, India - 637018*
[b]*Principal, Pavai College of Technology, Pachal, Namakkal, Tamilnadu, India - 637018*

Abstract: Quality of Service (QoS) is an important consideration in Video streaming services over LTE networks. The video streaming services suffers from latency and other communication error due to buffering during network streaming. This often occurs due to limited bandwidth and the video quality chosen by the users. This paper aims at reducing latency and improving QoS in inefficient bandwidth allocation in video streaming on wireless networks. The problem is solved with DASH encoder that sends the packets over the streaming networks. The QoS is improved using PID controller that takes into account the past and future bandwidths. The use of such feedbacks provides improved decision feedback during the selection of packets as per the allocated bandwidth to the user. Further, the decision is improved with the use of Exhaustive Search (ES) algorithm that exploits well the multicast communication as well the encoder in a limited space. The simulated results proved that the proposed method effective in reducing the latency with high QoS in delivery huge data in wireless networks.

Keywords: DASH, LTE, Exhaustive Search, PID controller.

1. INTRODUCTION

Since decades, the multimedia services in wireless communication play a vital role in indoors. Eventually, it is deployed and implemented well in home, office and other infrastructures [1]. The influence or the success widened the multimedia services to other networks. The LTE/LTE-A cellular network based services benefits its users through unified coverage and resource allocation through centralized approach. Such networks maintains longer distance transmission, however, stable communication is still a nightmare with huge data services. Demanding of more video services from wireless networks, affects seriously the Quality of Service (QoS) of the users exist in wireless networks. This can be defined as huge data services affect the existing voice service due to limited spectrum [2]. The factors that influences the QoS in LTE networks is shown in Figure 1.

Certain communication requires high reliability and lower jitter [3], especially in case of vehicular networks. In Adhoc wireless networks, larger throughput is required due to higher bandwidth requirement [4]. LTE networks

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Energy-Efficient QoE-Aware Video Adaptation and Resource Allocation for Video Streaming

[1]R. Jayavadivel and [2]J. Sundararajan

[1]Department of Information Technology, Paavai Engineering College,
Pachal, Namakkal, Tamilnadu, India 637 018
[2]Principal, Pavai College of Technology, Pachal, Namakkal, Tamilnadu, India 637 018

Abstract: In this paper, QoE-aware resource allocation and video adaptation method is proposed for energy efficient video streaming over OFDMA downlink. The proposed scheme for adaptation drops the packets selectively and that produces lower bitrate in video streaming services under delay and QoE constraints. This leads to load reduction and increased bandwidth capacity in video streaming wireless networks. The main aim of the proposed resource allocation strategy minimizes the transmission power that considers the delay constraints of identified video streams during adaptation phase in video streams. Simulation results shown considerable performance improvement in reducing end-to-end delay and energy efficiency by satisfying the requirements of QoE.

Key words: Video adaptation · QoE mapping · Dynamic Adaptive Streaming in HTTP (DASH) · Energy Efficiency · Resource Allocation

INTRODUCTION

Due to rapid advancement in embracing the tablets, smart phones, etc. has continuously increased the traffic in mobile video streaming services. Such an activity over time insisted the mobile operators for redesigning the wireless networks and that should support more concurrent video streaming. During this time, the several delay constraints and guaranteed QoS levels for each individual users is maintained. The provisions over varied video bitrate sources for an individual video using adaptive bitrate streaming (ABR) probably increases the capacity of the network. This helps in serving the additional concurrent video requests [1]. Moreover, various researches had offered caching in video services that maximizes the capacity of video in wireless streaming networks and further enhances the observed QoE [2-4].

Depending on ABR streaming, the individual video is split into many chunks with varied bitrates. Consequently, in order to serve the whole video from the cache, entire rate variants are cached. Nevertheless, this considerably increases storage requirements and backhaul requirements, since; the video gets encoded into 40+ different variants. This meets the network conditions and device heterogeneity [5]. Moreover, the available rate of transmission in network channels is considered time-variant and hence, it is very hard to predict the rate. Henceforth, the nominated bit stream, which is transmitted by the server, does not match the transmission features of the users [3]. Instead, the video with best quality is cached and the resource that is processed us allowed in performing the transrating [3]. Though, still it consumes the resources and computation that encodes the quality videos to be converted to various bitrates for storing the bitrates in an encoded stream in a real-time environment [4].

The backhaul and storage constraints in radio access network (RAN) are reduced by caching the varied bitrates of a video while downloading. The architecture of which is shown in Figure 1. Further, the RAN is enhanced using queued video adaptation module.

The module adopts the resource allocation strategy and the delay constrained DASH system with active queue management trans-rates the video stream from its lower bitrate and hence leading it to an energy-efficient resource allocation. Here in proposed module, the packet

Correspondin Author: R. Jayavadivel, Department of Information Technology, Paavai Engineering College, Pachal, Namakkal, Tamilnadu, India - 637 018.

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Security using cognitive service

B Venkatesan
Paavai Engineering College, Information Technology,
pecithod@paavai.edu.in

P Praveen Kumar
Paavai Engineering College, Information Technology,
praveenkpait@gmail.com

A Kishore Chowdary
Paavai Engineering College, Information Technology
developer.kishore@outlook.com

M Prabakaran
Paavai Engineering College, Information Technology
brightprabag@gmail.com

Abstract — Security using cognitive service is a project that can identify people by using their faces. Each face will have an unique measurements in terms of the parts like nose, ears, eyes, eyebrows, cheeks, chin and etc. The pictures of all the authenticated users will be stored in the face list as JSON scripts. These scripts are generated by the face API. Now, the photos of users will be taken for the authentication purpose and then processed using face API to generate the JSON script. Finally, this script is matched with the available face values in the face list. Here each face value that is stored in the face list will have its own unique ID. Whenever the measurements are matched, the availability of that specific face ID is checked in the face list. If it is available, then the person is authorized one. If there is no match for that specific face ID, then the person is concluded as unauthorized and concerned action can be taken over him. This can also be taken to a next level by using an IoT device namely Raspberry Pi for reaching people in a crowd without disturbing them or making them to know what we are doing. Thus, we will make use of a drone to carry the Raspberry Pi device in the air.

Index Terms — Azure, Cognitive Service, Face API, IoT.

1 Introduction

Security is most important concern in this modern world. As the technology grows on, the need of security is also increasing on. This security can be in the form of physical security, financial security, digital security or even personal security. For all these kind of security purposes, we will be depending on the security guards, security cameras, scanners, dogs and even some other electronic gadgets that can help us in achieving these goals.

This paper is all about the security feature that takes the term security to a next level. Using this, we can implement security in an advanced level with minimal cost. For achieving this goal, we can make use of azure cognitive service that works with face API. To make this feature little more advanced, we will use IoT device so that we will be able to reach the people in a crowd with ease. Thus, we will be able to achieve security at the maximum level. With this we will be able to avoid spending money for maintaining security guards or security devices. Along with this, we can completely reduce the cost and time which we invest for the security. Thus, the security using cognitive service can be implemented for this.

2 Existing General Security Systems

There are many systems that are in existence for achieving the goal of security. Security guards, security cameras like CCTV, security dogs and scanners have their own kind of approach in achieving this goal. But still all these have their own drawbacks in terms of their processing. Appointing a security guard requires for making a payment for the guard every month in the name of salary. Also, we cannot assure that a security guard is capable of guarding 24/7 since the guard is a human and they too require some resting time for sure. Same way, considering a dog, it cannot guard all the time since it also requires the kind of maintenance in form of feeding, and maintaining the same. This means, even the dogs cannot be used for security purposes in a reliable manner. Coming to the next one namely the cameras and other security gadgets, all these are not completely secure and reliable at some point. Today there are lot of technologies that are available in market which can be used to jam all these devices from doing their works. Out of all, managing and maintain all these kind of security features will cost us a lot. Even the initial deployment of all these services is too high.

3 Security Using Cognitive Service

The Security Using Cognitive Service makes use of the modern technologies like face API, IoT and Windows apps. The user will be able to achieve the security goal with a minimal cost. The measurements of faces will be generated using face API and is then processed using applications.

3.1 Microsoft Azure Cognitive Services

Microsoft Cognitive Services (formerly Project Oxford) are a set of APIs, SDKs and services available to developers to make their applications more intelligent, engaging and discoverable. Microsoft Cognitive Services expands on Microsoft's evolving portfolio of machine learning APIs and enables developers to easily add intelligent features – such as emotion and video detection; facial, speech and vision recognition; and speech and language

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Oscillation theorems for third-order retarded differential equations with a sublinear neutral term

V. Ganesan[1]* and M. Sathish Kumar[2]

[1]Department of Mathematics
Aringar Anna Government Arts College
Namakkal - 637002, Tamilnadu, India.

[2]Department of Mathematics
Paavai Engineering College
Namakkal - 637018, Tamilnadu, India.

March 6, 2017

Abstract

This paper concerns the oscillatory behavior of the solutions of the third-order neutral differential equation with a sublinear neutral term. We give sufficient conditions for every solution to be either oscillatory or to converges to zero. The results obtained here extend and improve some of the existing results. Examples are provided to illustrate the relevance of new theorems.

AMS Subject Classification: 34C10, 34K11.
Key Words and Phrases: Third-order, oscillatory behavior, neutral differential equation, a sublinear neutral term

*Corresponding Author.

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OSCILLATION OF CERTAIN THIRD ORDER NONLINEAR DIFFERENTIAL EQUATION WITH NEUTRAL TERMS

V. Ganesan[1]*, **M.Sathish Kumar**[2]
[1] *Department of Mathematics, Aringar Anna Government Arts College, Namakkal - 637002, Tamilnadu, India.*
E-mail: ganesan_vgp@rediffmail.com
[2] *Department of Mathematics, Paavai Engineering College, Namakkal-637018, Tamilnadu, India.*
E-mails: msksjv@gmail.com ; sathishkumarmarappanpec@paavai.edu.in

**Corresponding author.*

Abstract The main goal of this work is to establish some new comparison theorems for oscillation of solutions of the third order nonlinear differential equations with neutral terms of the form

$$\left[r(t)\left[\left(x(t)+\sum_{i=1}^{n}p_i(t)x(\eta_i(t))\right)''\right]^{\gamma-1}\right]'+q(t)x^{\gamma}(\sigma(t))=0,$$

are presented. We give several Theorems and related examples to illustrate the main results.

MSC: 34K11, 34C10, 34C15

Keywords: Third order neutral differential equation, Non linear, Comparison theorem, Oscillation of solutions.

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1. Introduction

This work is concerned with oscillation behavior of a class of third order nonlinear neutral differential equation

$$\left[r(t)\left[\left(x(t)+\sum_{i=1}^{n}p_i(t)x(\eta_i(t))\right)''\right]^{\gamma-1}\right]'+q(t)x^{\gamma}(\sigma(t))=0, \tag{E}$$

where $n>0$ is an integer, $q(t)$, $\sigma(t)$, $p_i(t)$ and $\eta_i(t)$ are oscillatory different solutions on $[t_0,+\infty)$. Throughout this paper it always assume the following conditions hold:

- (C_1) γ is a quotient of odd positive integers, $r(t),q(t)>0$, $0\leq p_i(t)\leq a_i<\infty$ for $i=1,2,...,n$;
- (C_2) $\eta_i\ \sigma=\sigma\ \eta_i$, $\eta_i'(t)\geq A_i>0$ for $i=1,2,...,n$; and $\lim_{t\to+\infty}\sigma(t)=\infty$, $\sigma(t)<t$;

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On the oscillatory behavior of solutions of third order nonlinear neutral differential equations

M. Sathish Kumar[1] and V. Ganesan[2,*]

Abstract

The achieved results are based on the new comparison principles, which help us decrease the problem of the wavering between the third and first-order equations. Examples are given to prove the significance of new theorems.

Keywords

Oscillation, neutral, third-order, comparison theorem, differential equation.

AMS Subject Classification

34K11, 34C10, 34C15.

[1] *Department of Mathematics, Paavai Engineering College (Autonomous), Namakkal-637018, Tamil Nadu, India.*

[2] *PG and Research Department of Mathematics, Aringar Anna Government Arts College, Namakkal - 637002, Tamil Nadu, India.*

*__Corresponding author__: ganesan_vgp@rediffmail.com; msksjv@gmail.com

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1. Introduction

We consider the third-order nonlinear neutral differential equation of the form

$$\left[a(t)\left[z''(t)\right]^{\gamma}\right]' + q(t)\varphi(x(\sigma(t))) = 0, \quad t \geq t_0 > 0, \tag{1.1}$$

where $z(t) := x(t) + p(t)x(\eta(t))$ and $q(t), \sigma(t) \in C([t_0, +\infty))$, $a(t) \in C^1([t_0, +\infty))$, $p(t)$, $\eta(t) \in C^2([t_0, +\infty))$. Further, assume the hypotheses are tacitly supposed to hold,

(A_1) γ is a quotient of odd positive integers, $a(t), q(t) > 0$, $0 \leq p(t) \leq p_0 < \infty$;

(A_2) $\varphi[u] = |u|^{\gamma-1}u$ and $\lim_{t\to+\infty} \eta(t) = \lim_{t\to+\infty} \sigma(t) = \infty$, $\sigma(t) < t$;

(A_3) $\eta'(t) \geq \eta_0 > 0$, $\eta \circ \sigma = \sigma \circ \eta$;

and, moreover,

$$\lim_{t\to\infty} R(t) = \infty, \quad R(t) = \int_{t_0}^{t} \frac{1}{a^{1/\gamma}(s)} ds. \tag{1.2}$$

Under a solution to Eq.(1.1), we mean a function $x(t)$ in $C^2[T_x, \infty)$ for which $a(t)(z''(t))^{\gamma}$ is in $C^1[T_x, \infty)$ and Eq.(1.1) is satisfied on some interval $[T_x, \infty)$, where $T_x \geq t_0$. We only consider those solutions $x(t)$ for which $\sup\{|x(t)| : t \geq T\} > 0$ for all $T \geq T_x$.

A solution x of Eq.(1.1) is called oscillatory if it has arbitrarily large zeros on $[T_x, \infty)$ and it is non-oscillatory otherwise. Equation (1.1) itself is said to be oscillatory if all its solutions are oscillatory. Equation (1.1) called almost oscillatory if all its solutions are either oscillatory or satisfies $\lim_{t\to\infty} x(t) = 0$.

It is known oscillatory behavior of solutions of various classes of neutral/delay differential equations are often encountered in applied problems in natural sciences, technology and engineering, as examples shown by Hale [1]. Of late, a large amount of interest in oscillatory properties of various classes of third-order linear/nonlinear neutral differential equations has been found. Baculiková and Dzurina [2, 3], Li et al. [8, 9] studied the oscillatory behavior of the second and third order differential equation if $0 \leq p(t) < 1$. Thandapani and Li [7] obtained oscillation results for Eq.(1.1) using Riccati substitution technique. Ganesan and Sathish Kumar [10–12] obtained some comparison and Philos type oscillation results for third order neutral equation with mixed arguments. Sathish Kumar et al. [13] studied the oscillation and asymptotic behavior of the third order mixed neutral differential equation. Yang and Xu [14] established some new Kamenev-type oscillation criteria of Eq.(1.1).

Despite there, to the best of authors' knowledge, here is

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Oscillation Criteria For Second-Order Neutral Differential Equations

V. Ganesan[1]* and M. Sathish Kumar[2]

[1]Department of Mathematics
Aringar Anna Government Arts College
Namakkal - 637002, Tamilnadu, India.
ganesan_vgp@rediffmail.com

[2]Department of Mathematics
Paavai Engineering College
Namakkal - 637018, Tamilnadu, India
msksjv@gmail.com

Abstract

The aim of this paper is to study the oscillation of a class of second-order neutral differential equations of the form

$$\left[r(t)\left[x(t)+p(t)x(\tau(t))\right]'\right]'+q(t)x(\sigma(t))+v(t)x(\eta(t))=0,$$

are presented. Obtained results are based on the new comparison theorems that enable us to reduce problem of the oscillation of the second order equation to the oscillation of the first order equations. New oscillation theorems and illustrative examples are presented that improve those known results in the literature.

Key Words and Phrases: Oscillation, Neutral differential equations, Positive solutions, Comparison.
AMS Subject Classification: 34K11, 34C10.

*Corresponding Author

ON THE OSCILLATION OF A THIRD ORDER NONLINEAR DIFFERENTIAL EQUATIONS WITH NEUTRAL TYPE

V. Ganesan

Department of Mathematics, Aringar Anna Government Arts College,
Namakkal, Tamilnadu, India
ganesan_vap@rediffmail.com

M. Sathish Kumar

Department of Mathematics, Paavai Engineering College (Autonomous),
Namakkal, Tamilnadu, India
msksjv@gmail.com

Abstract: In this article, we investigate the oscillation behavior of the solutions of the third-order nonlinear differential equation with neutral type of the form

$$\left(a_1(t)\left(a_2(t)Z'(t)\right)'\right)' + q(t)f\left(x(\sigma(t))\right) = 0, \quad t \geq t_0 > 0,$$

where $Z(t) := x(t) + p(t)x^{\alpha}(\tau(t))$. Some new oscillation results are presented that extend those results given in the literature.

AMS Subject Classification: 34C10, 34K11.
Key words: Oscillation, Nonlinear, Neutral differential equation, Third order.

1. Introduction

Consider the third order non-linear neutral delay differential equation

$$\left(a_1(t)\left(a_2(t)Z'(t)\right)'\right)' + q(t)f(x(\sigma(t))) = 0, \quad t \geq t_0 > 0, \tag{E}$$

where $Z(t) := x(t) + p(t)x^{\alpha}(\tau(t))$ and $0 < \alpha \leq 1$ is a ratio of odd positive integers. Throughout this paper, without further mention, let

(A_1) $a_i(t) \in C([t_0, +\infty))$, $a_i(t) > 0$ for $i = 1, 2$ and $p(t), q(t) \in C([t_0, +\infty))$, $q(t) > 0$;

(A_2) $\tau(t) \in C([t_0, +\infty))$, $\tau(t) \leq t$, $\sigma(t) \in C([t_0, +\infty))$, $\sigma(t) \leq t$;

(A_3) f is nondecreasing and $uf(u) \geq k > 0$ for $u \neq 0$ and $\lim\limits_{t\to+\infty} \tau(t) = \lim\limits_{t\to+\infty} \sigma(t) = \infty$.

By a solution of equation (E) we mean a nontrivial real valued function $x(t) \in C([T_x, \infty)), T_x \geq t_0$, which has the property $Z'(t) \in C^1([T_x, \infty))$, $a_2(t)Z'(t) \in C^1([T_x, \infty))$, $a_1(t)(a_2(t)Z'(t))' \in C^1([T_x, \infty))$ and satisfies (E) on $[T_x, \infty)$. We consider only those solutions $x(t)$ of (E) which satisfy $\sup\{|x(t)| : t \geq T\} > 0$ for all $T \geq T_x$. A solution of (E) is called oscillatory if it has arbitrarily large zeros on $[T_x, \infty)$ and otherwise, it is said to be non-oscillatory. Equation (E) is called almost oscillatory if all its solutions are oscillatory or convergent to zero asymptotically.

In the last years, a great deal of interest in oscillatory properties of neutral functional differential equations has been shown, we refer the reader to [1–8] and the references cited therein. A number

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A comparative investigation on humidity sensing and photocatalytic applications of Sb doped SnO_2 by microwave combustion route

A. Rathinam[1] · G. Balaji[1] · S. Vadivel[2]

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Abstract
This work highlights the high sensitivity humidity sensor and photocatalytic activity of pure and Sb doped SnO_2 nanoparticles by microwave combustion route. The role of Sb dopant on structural, morphological and optical properties were systematically investigated by powder X-ray diffraction (XRD), Field emission scanning electron microscope (FESEM), Raman spectra, UV–Vis absorption spectra and Photoluminescence spectra analysis. PXRD and Raman results reveal that SnO_2 is nanocrystalline with tetragonal structure. The structure of SnO_2 does not change with Sb doping but the shape of the nanoparticles changes from spherical to needle like morphology by Sb doped SnO_2, which is confirmed through FESEM micrographs. Tuning of band gap and enhanced absorption edge was found to be UV and PL spectra analysis. The Sb doped SnO_2 sample showed high performance humidity sensing such as high sensitivity, fast response (40 s) and recovery time (35 s). The photocatalytic activities of the samples were evaluated by photocatalytic degradation of Methylene blue and Crystal violet and the results showed that Sb doped SnO_2 could enhance photocatalytic activity compared to the undoped SnO_2 nanoparticles. The most probable photocatalytic mechanism is also proposed in detail.

1 Introduction

Humidity sensing technology is most important for the specific control and reliable estimate of water vapor content in the atmosphere from industrial processes to the broad improvement in the quality of life. Commonly a humidity sensor has to possess fast response and recovery time, high sensitivity, good stability, negligible hysteresis over periods of usage, and possibly a large operating range for both humidity and temperature [1, 2]. Semiconducting metal oxides based humidity sensor have rapid advantages compared to other types of humidity sensor such as cost effective, operation simplicity, small size and ease of placing the sensor in the operating environment. In general, electrical conductivity of metal oxides (SnO_2, WO_3, TiO_2 and ZnO) depends upon the leading composition of the humidity and gas surrounding them. Therefore they are the fashionable and useful sensing materials for making inexpensive humidity and gas sensing devices [3]. Among the various types of metal oxide sensors, particularly tin oxide (SnO_2) being an important n-type semiconductor with a wide band gap ($E_g = 3.6$ eV at 300 K).SnO_2 possesses many exclusive optical and electrical properties: remarkable receptivity variation in gaseous environment, high humidity sensing behavior, high optical transparency in the visible range (up to 97%), low resistivity (10^{-4}–10^6 Ω cm^{-1}), and excellent chemical stability [4]. Moreover, it has been widely used in various applications such as gas sensor, photosensors, photocatalyst, bio sensor, solar cell and antistatic coating [5] etc.

Recently the researchers have been focusing on the high sensitivity humidity sensing behavior of SnO_2 by tuning the morphology or doping methods. Parthibavarman et al. [6] have investigated the humidity sensing performance of hexagonal shaped SnO_2 nanostructures by microwave irradiation method and reported that high sensitivity (92%), fast response (32 s) and recovery time (25 s) of the sensing materials. Huang et al. [7] have reported that Sb-doped SnO_2 whiskers by thermal evaporation method and investigated their humidity sensing behavior. Zhuo et al. [8] have investigated the humidity sensing properties of a single Sb doped SnO_2 nanowire field effect transistor by using lithography method. Attempt to further improvement in the humidity

✉ S. Vadivel
vadivel.physics@gmail.com

[1] Department of Electrical and Electronics Engineering, Paavai Engineering College (Autonomous), Namakkal, Tamilnadu 637 018, India

[2] Department of Physics, Paavai Engineering College (Autonomous), Namakkal, Tamilnadu 637 018, India

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Fluorine-doped nanocrystalline ZnO powders prepared via microwave irradiation route as effective materials for photocatalyst

N. P. Subiramaniyam[1] · S. Vadivel[2] · S. Kumaresan[3] · K. Vallalperuman[4]

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Abstract In this report, we have successfully synthesized nanocrystalline pure and F doped ZnO prepared by one-step microwave irradiation method without using any post annealing treatment. The effect of F dopant on structural, morphological and optical properties were systematically investigated by using powder X-ray diffraction (XRD), field emission scanning electron microscope (FESEM), Raman spectra, UV–Vis absorption spectra and photoluminescence spectra analysis. XRD results reveals that both pristine and F doped ZnO had a hexagonal wurtzite type structure and the results are in good agreement with standard JCPDS data (card no. 36-1451). FESEM images showed that random platelets morphology with average diameter around 50–35 nm. A considerable red-shift in the absorption edge and decreasing the band gap of pure ZnO (3.32–3.12 eV) was confirmed though UV–Vis spectra. The defect in crystal and oxygen vacancy was analyzed through PL spectra analysis. The photocatalytic activities of the catalyst powders were evaluated by photocatalytic degradation of methyl violet (MV) and rhodamine B (RhB) and the results showed that the doping of F into ZnO nanoparticles could enhance photocatalytic activity compared to the undoped ZnO nanoparticles, this could be due to reduction of band gap and superior textural properties. The improved photocatalytic mechanism by F doping was also discussed in detail.

✉ S. Kumaresan
mphilskumar@gmail.com

[1] Department of Electronics, Nehru Arts and Science College, Coimbatore, Tamilnadu 641 105, India

[2] Department of Physics, Paavai Engineering College (Autonomous), Namakkal, Tamilnadu 637 018, India

[3] Research and Development Centre, Bharathiar University, Coimbatore, Tamilnadu 640 046, India

[4] Department of Physics, Thiru Kolanjiappar Government Arts College, Vriddhachalam, Tamilnadu 606 001, India

1 Introduction

In recent years, environmental contamination has become one of the major drawbacks in developing and developed countries around the world. As a result, continuous efforts have been adapted to develop innovative technologies in order to remediate polluted environment. It is well known that photocatalysis provide as an attractive tool owing to its efficiency and relatively low cost [1]. At present, titanium dioxide (TiO_2) is the most widely used and studied photocatalyst due to its outstanding physical and chemical properties, band gap and high visible light absorption properties. However, several studies have proved that zinc oxide (ZnO) can also serve as a suitable option, mainly due to its low cost and the ability to absorb a larger fraction of the solar spectrum than TiO_2 [2–4]. ZnO is one of the most important semiconductors and has been widely used as a photocatalyst due to its large area-to-volume ratio, direct wide band gap (3.37 eV), high photosensitivity, low cost and high chemical stability [5, 6] and promising candidates for applications in photovoltaic [7], humidity sensors [8], nano-generators [9], transparent thin film transistors [10], solar cells [11] and light emitting diodes [12]. One of the major disadvantages of ZnO as a photocatalyst is the fast electron/hole recombination, which is faster than the surface redox reactions and limits the photodegradation reaction under normal conditions.

Many nobal metals (e.g., Au, Ag, Pt, or Pd) [13–16], and metals (Fe, Mg, Ca and Al) [17] were effectively used to prevent recombination of electron/hole pairs and improve

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A Facile Route to the Synthesis of Zn-Doped CdO Nanostructures and a Comparative Investigation on Humidity-Sensing and Photocatalytic Applications

G. BALAJI,[1] A. RATHINAM,[1] and S. VADIVEL [2,3]

1.—Department of Electrical and Electronics Engineering, Paavai Engineering College (Autonomous), Namakkal, Tamilnadu 637 018, India. 2.—Department of Physics, Paavai Engineering College (Autonomous), Namakkal, Tamilnadu 637 018, India. 3.—e-mail: vadivel.physics@gmail.com

Pure and zinc-doped CdO nanoparticles were synthesized via a novel microwave combustion method. The structural, morphology, chemical composition and optical properties of the samples were systematically investigated. The powder x-ray diffraction patterns reveal that both pure and doped samples are of a single crystalline nature with a cubic Fm3m CdO structure. Spherical-shaped morphology with an average diameter of around 25–35 nm was observed by field emission scanning electron microscope analysis. Optical studies showed that Zn^{2+}-doped CdO decreases the band gap energy (E_g) from 3.42 eV to 3.12 eV. The sensor was produced via an extremely simple process in which Zn-CdO powders were deposited directly into an interdigital electrode immersed in a chemical bath under ambient conditions. The proposed sensor showed almost linear behavior within a chosen range of humidity (between 10% and 90% RH) and fast response (25 s) and recovery time (20 s). Our reproducible experimental results exhibited that Zn-doped CdO nanoparticles have a great potential for humidity-sensing applications in room temperature operations. The samples were further investigated for their photocatalytic activity by degradation of Rhodamine B and Methyl orange under UV light irradiation. The improved photocatalytic mechanism by Zn doping is also discussed in detail.

Key words: Zn-doped CdO, humidity sensor, high sensitivity, UV light irradiation, Rhodamine B

INTRODUCTION

For the past 20 years, concern about environmental safety has prompted much research in sensor development. Even though a variety of sensors has been developed in the process industries, agriculture, medicine and many other areas, the development of sensing materials with high sensing capabilities is still proceeding at an unprecedented rate. Among the various types of sensors (gas, mechanical, optical, thermal, etc.), the humidity sensor is one of the most crucial for industry as well as human life. In recent years, different types of ceramic oxides have been consistently investigated as humidity-sensing materials.[1] Semiconducting oxide-based humidity sensors have shown positive advantages when compared to other types of humidity sensors, such as low cost, simple construction, small size and ease of placement in the operating environment.[2] The electrical conductivity of the metal oxide changes depending on the surrounding gas and humidity on the surface. Thus, they are useful sensing materials for the production of cost-efficient gas-sensing and humidity sensor-based devices.[3] Among these, cadmium oxide (CdO) is one of the most important metal oxide semiconductors due to its outstanding optical and electrical

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Enhancing the structural, optical and magnetic properties of Cu_2O films deposited using a SILAR technique through Fe-doping

S. Satheeskumar[1] · S. Vadivel[2] · K. Dhanabalan[3] · A. Vasuhi[4] · A. T. Ravichandran[5] · K. Ravichandran[6]

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Abstract
Undoped and Ferrous (Fe)-doped Cu_2O thin films were deposited onto glass substrates using successive ionic layer adsorption and reaction method. The variation in the concentration of Fe has significant impact on the final film properties, Fe doping with 5 wt% exhibited major property improvements compared with undoped and Fe doped films. The structural, optical, morphological, magnetic properties and atomic force microscope of the films were systematically investigated. The X-ray diffraction analysis showed that all the films had good crystalline quality and the preferential orientation along (111) plane. Optical studies show that the transmittance and optical band-gap values are maximum (2.5 eV) for the Fe doping level of 5 wt%. The relative errors are calculated for crystallite size and optical energy band gap values. The photoluminescence study confirms the presence of various defects in the Cu_2O matrix. The Fourier transform infrared results confirmed the presence of expected compounds in the samples. The field emission-scanning electron microscope images indicate that there is a gradual decrease in the grain-size with increase in the Fe doping level and a flower-like structure is obtained in the maximum doping level of Fe. The high resolution transition electron microscope reveals single-crystal nature. Magnetic measurements showed that undoped Cu_2O films exhibit diamagnetic behavior and at the maximum (5 wt%) Fe doping level, the films behave as anti-ferromagnetic material. The atomic force microscope reveals that the smoothness of the film surface increases at the maximum doping of Fe concentration.

1 Introduction

Metal oxide materials have a modifications in all fields because of their unique physical and chemical properties. Especially nano structured metal oxide materials are versatile in the applications. Cu_2O is one of the p-type semiconducting metal oxide materials with a direct band gap value of approximately 2.17 eV [1] and it is makes at a promising material for photo-catalytic and solar-cell application. Recently, metal oxide oxide materials have been found applicable in all fields, in their pure and doping films. Cu_2O behaves as the parent compound in many p-type transparent conducting oxides (TCOs: $CuAO_2$—Al, Cr, Ga, etc.,) [2]. The magnetic materials doped with Cu_2O (such as Fe, Ni, Co and Mn) increases the magnetic properties of the semiconducting materials [3]. In Fe-doped Cu_2O delafossite thin films iron is used in layer-quantities and serves as the important transition-element. Cu_2O is a suitable candidate for Bose–Einstein condensation because of its higher binding energy. The material can be used in a wide range applications such as gas sensors [4], Solar energy [5, 6], lithium–ion batteries [7], photo catalyst [8], dilute magnetic

✉ K. Dhanabalan
vasuhidhanabalan@gmail.com

1 Department of Physics, K.S.R. Institute for Engineering and Technology, Tiruchengode, Namakkal, Tamil Nadu, India

2 Department of Physics, Paavai Engineering College (Autonomous), Pachal, Namakkal, Tamil Nadu, India

3 Post Graduate and Research Department of Physics, J.J. College of Arts and Science (Autonomous), Pudukkottai, Tamil Nadu, India

4 Department of Physics, H.H. The Rajah's College (Autonomous), Pudukkottai, Tamil Nadu, India

5 Post Graduate and Research Department of Physics, National College (Autonomous), Tiruchirappalli, Tamil Nadu, India

6 Post Graduate and Research Department of Physics, A.V.V.M. Sri Pushpam College (Autonomous), Poondi, Thanjavur, Tamil Nadu 613 503, India

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PHYSICO – CHEMICAL ANALYSIS ON CETYLPYRIDINIUM CHLORIDE (CPC) WITH ALCOHOL SOLUTION AT DIFFERENT TEMPERATURES - ULTRASONIC, UV AND FTIR ANALYSIS

V. KARIKALAN[a*], A. PANNEERSELVAM[b], K. VALLALPERUMAN[c]
[a]*PG Assistant in Physics, Government Model School, Mallur, India - 636203*
[b]*Department of Physics, Paavai Engineering College, Pachal, Namakkal, India- 637018*
[c]*Department of Physics, ThiruKolanjiappar Govt. Arts College, Vridhachalam, India- 606001*

The ultrasonic velocity, density and viscosity in the mixtures of Cetylpyridinium Chloride (CPC) with Water - Alcohols (Methanol, Ethanol and 1-Propanol) in different concentration ranges are measured at different temperatures 303, 313 and 323K with a view to determine the Critical Micelle Concentration (CMC). From the experimental data, other related acoustical parameters such as adiabatic compressibility (β), intermolecular free length (L_f), internal pressure (π_i), free volume (V_f), cohesive energy (C_E), relaxation time (τ), Rao's constant (R_a),absorption coefficient (α/f^2), acoustical impedance (Z_a) and solvation number (S_n) have been evaluated. All these parameters have utilized to study of various molecular interactions takes place in binary mixtures of (i) CPC + Water - Methanol, (ii) CPC + Water - Ethanol and (iii) CPC + Water -1- Propanol solution. The Critical Micelle Concentration (CMC) of (Cetyl Pyridinium Chloride (CPC) with Water - Alcohols) was determined to be 0.6%ofCetyl Pyridinium Chloride (CPC) with Water–Methanol and Water -Ethanol, 0.8% of Cetyl Pyridinium Chloride (CPC) with Water -1-Propanol system. The UV and FTIR studies were also used to characterize these samples. The results are discussed in molecular interactions, absorption and functional groups.

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*Keywords :*Ultrasonic study, Binary mixture, Cetyl Pyridinium Chloride (CPC), Critical Micelle Concentration (CMC).

1. Introduction

The study of propagation of ultrasonic waves in liquids and liquid mixtures is very much useful for examining the nature of inter and intra molecular interactions. Physico-chemical properties can be understand among the interacting components from ultrasonic velocity measurements and it can be coupled with other experimental data such as density and viscosity to calculate various acoustical parameters such as adiabatic compressibility, free length, acoustic impedance, relaxation time, free volume and internal pressure, which are useful in understanding the molecular interactions in binary mixtures [1-4]. Ultrasonic velocity is an important physical parameter having structural dependence [5-7]. CPC is cationic quaternary ammonium compound used in mouthwashes, toothpastes, throat and nasal sprays. The Micellization of Cationic Surfactant in these water-alcohol media have been found to be both dependent on nature as well as the concentration of alcohol in water [8].In ionic surfactant systems, ethanol addition makes the CMC decrease followed by an increase. However, in the systems of nonionic or cationic surfactants, ethanol addition just makes the CMC go up [9].The CMC values shift toward higher concentration with increase in alcoholic content up to certain concentration beyond which decrease in CMC is registered in case of all the alcohols [10,11].

In the present investigation, ultrasonic velocities have been measured in binary mixtures of (i) CPC + Water - Methanol, (ii) CPC +Water - Ethanol and (iii) CPC + Water - 1- Propanol

*Corresponding author: kariphy05@gmail.com

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Flexural Behavior of Polyvinyl Alcohol Fiber Reinforced Concrete

Mr.L.Kannan [1] , Mr.M.Ganeshkumar [2], Mr.T.S.Venkatachalam [2,3]

[1]Assistant Professor, Department of Civil Engineering

[2,3]P.G student, Department of Civil Engineering

Paavai Engineering College,Namakkal, India

Abstract

The usefulness of fiber reinforced concrete (FRC) in various civil engineering applications is indisputable. Fiber reinforced concrete has so far been successfully used in slabs on grade, shotcrete, architectural panels, precast products, offshore structures, structures in seismic regions, thin and thick repairs, crash barriers, footings, hydraulic structures and many other applications. This report presents a brief state-of-the-art report on flexural behavior of polyvinyl alcohol fiber reinforced concrete. Civil infrastructure around the world the problem is at the apparent lack of tensile strength in our concrete. This paper present data to support the argument that polyvinyl alcohol fiber reinforced concrete is an ideal material for achieving these goals. The research also discusses poly vinyl alcohol fiber reinforced concrete materials properties and mix design. The PVA fiber will be added to the conventional concrete 0%, 0.1%, 0.2%, 0.3% and 0.4% by its cement weight. The optimum level of PVA fiber was determined as 0.3 based on the compressive strength, split tensile strength and modulus of rupture. The beam was casted with size of 125X150X1800mm with 0.3% of PVA Fiber. Then the flexural behavior was studied and compared with conventional concrete.

Key Words *– Polyvinyl alcohol fiber, Flexural Behavior*

I. INTRODUCTION

Concrete is a mixture of Cement, Fine aggregate, Coarse aggregate and Water. In plain concrete and similar brittle materials, structural cracks [micro – cracks] developed even before loading, particularly due to drying shrinkage or other causes of volume change. The width of these initial cracks seldom exceeds a few microns, but their other two dimensions may be higher magnitude.

It has been recognized that the addition of small, closely spaced and uniformly dispersed fibers to concrete would act as a crack arrest and would substantially improve its static and dynamic properties. This type of concrete is known as Fiber Reinforced Concrete.

Fiber reinforced concrete can be defined as a "***composite material consisting of mixtures of cement, mortar or concrete and discontinuous, discrete, uniformly dispersed fibers***".

Continuous meshes, woven fabric and long wires or rods are not considered to be discrete fibers. The following fibers are could be used as in concrete.

- Steel fibers.
- Polypropylene fibers,
- Nylon fibers.
- Asbestos fibers.
- Coir fibers.
- Glass fibers.
- Carbon fibers.

Fiber is a small piece of reinforcing material possessing certain characteristic properties. They can be circular or flat. The fiber is often described by a convenient parameter called "aspect ratio". The aspect ratio of the fiber is the ratio of its length to its diameter. Typical aspect ratio value ranges from 30 to 150.

II. EXPERIMENTAL PROGRAMME

A. Materials

For this research work Ordinary Portland Cement 53 grade was used. Locally available fine and coarse aggregate was used with specific gravity of 2.75 and 2.8. The maximum size of coarse aggregate was 12.5mm. The Poly vinyl Alcohol fiber was obtained from Spinning King (India) Limited, Gujarat, India. With following Properties.

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Flexural Behaviour of Potassium Based Geopolymer Concrete

Mr. P. Kalimuthu
Associate Professor,
Department of Civil Engineering
Paavai Engineering College
Pachal, Namakkal

Mr. L. Kannan
Assistant professor,
Department of Civil Engineering
Paavai Engineering College
Pachal, Namakkal

Abstract: **The global usage of cement occupies the second position next to water. As the development of country and infrastructure, their materials needed get increased. Meanwhile for the development of the infrastrueture concrete plays the major role. In concrete the major material or ingredient is ordinary Portland cement (OPC). OPC creates two major problems at the time of production; the emission of CO2 due to calcination of limestone and the usage of extensive amount of energy. On the other hand, fly ash is the material which is emitted from the power plants at the time of electricity production which has similar and superior properties of cement. If fly ash is mixed with any kind of hydroxide and silicate it forms as the binder, which is termed as geopolymer. In this paper we used the Potassium Hydroxide and Potassium Silicate as the combination of the alkaline solution. The present paper presents the study of potassium based geopolymer concrete with paper sludge ash as partial replacement of fly ash for 0%, 5%, 10%, 15% and 20% in geopolymer concrete under various curing conditions such as Hot air Oven curing, Sun light curing and Ambient curing. The Flexural behavior of geopolymer concrete beams, flexural strength test, Load carrying capacity, ductility factor, crack pattern, beam deflection and moment curvature etc., for the geopolymer concrete produced from the Fly Ash and Paper Sludge Ash with Catalytic liquid system and aggregates under various curing conditions such as Hot air Oven curing, Sun light curing and Ambient curing.**

Keywords: Geopolymer, Potassium Hydroxide, Potassium Silicate, Paper sludge ash.

I. INTRODUCTION

Geopolymer is an inorganic polymer. Geopolymers are material based on pure aluminosilicate source materials such as fly ash, GGBS, calcined clays such as metakaolin activated with an alkali hydroxide and silicate solution [1]. Geopolymerisation is an exothermic process involving dissolution – reorientation - solidification reactions. Geopolymers can be produced with various microstructures in relation to Si: Al ratio. A low of Si: Al ratio leads to rigid formation of structures and of high ratio leads to polymeric characters of geopolymer materials.

Geopolymers are considered as tow- component system (reactive based material and alkaline activation solution), they are suitable in precast industries. The manufactures of the products such as larger diameter pipes and roofing tiles, precast concrete products, structural and non-structural members for building systems and bridge structures, railway sleepers, electric power poles, road bases, marine products and other products for infrastructure are possible uses of the geopolymer [2]. Besides these high-tech applications, special geopolymer concrete has been used for repairing runways or motorways because they set and harden quickly and develop the high compressive strength in four hours [3].

Low calcium fly ash based geopolymer concrete resembles in good compressive strength as well as resistance to sulphate attack [4]. Geopolymer concrete does not require any quantity of water for hydration process to held, yet requires only alkaline solution. The solution should reach the maximum of pH value so that the hydration process would be taken in proper way. It was found that geopolymer concrete strength depends upon the factors such as concentration of hydroxide, the silicate to hydroxide ratio, curing time, admixture, handling time and age of concrete.

II. EXPERIMENTAL PROGRAME

A. *Materials Used*

Fly ash used for geopolymer concrete belongs to Class F (Low calcium based fly ash), which obtained from Mettur Thermal Power station with specific gravity of 1.90. Paper sludge ash was collected from SPB Paper Mill, Pallipalayam with specific gravity of 2.29 Fine aggregates were clean and naturally obtained for the river, with the specific gravity of 2.70. Coarse aggregate were locally obtained with the specific gravity of 2.74

TABLE I CHEMICAL COMPOSITION OF FLY ASH

Component	Fly ash
SiO_2	56.5
Al_2O_3	22.14
Fe_2O_3	4.54
TiO_2	2.26
K_2O	1.07
CaO	0.95
Mgo	0.55
Others	10.52
LOI*	1.47

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Firefly optimized k means clustering for gene selection

Magendiran N.[1]* and Selvarajan S.[2]
1. Associate Professor, Department of CSE, Paavai Engineering College, INDIA
2. Principal, Muthayammal College of Engineering, INDIA
*magendirannatarajanpec@paavai.edu.in

Abstract
The fundamental purpose of microarray or gene appearance data scrutiny is to identify the co-expressed genes as well as bright patterns. It also plays a vital role in investigating bioinformatics. Microarray technology can concurrently produce large quantity of microarray gene expression data for various samples, which permits effective analysis and diagnosis of breast cancer. It is not essential to have all the genes in the data set for classification as well as for diagnosis. While diagnosing breast cancer only informative genes are retained through gene selection process while redundant, inappropriate as well as noisy genes are discarded. This work proposes the pillar algorithm with K means as well as Weighted K Means (WKM) clustering algorithm and Firefly Algorithm (FA) based K means clustering.

Keywords: Gene selection, Weighted K Means (WKM) clustering algorithm, Firefly Algorithm (FA), Cluster Centre Initialization Algorithm (CCIA).

Introduction

The current generation has several techniques as well as scientific findings such as decision support system, image as well as scanning systems to assist clinicians in making suitable decisions. Since these techniques are expensive, remote areas are still lacking in such facilities. Consequently, the poor as well as the needy are deprived of such services. The doctor's knowledge and experience plays a major role in clinical decisions[1]. Many a times, these decisions are misleading as they are due to misinterpretations and it is becoming a very sensitive issue.

The most significant area of research is identifying genes that cause diseases. By identifying those attributes, it becomes easier to diagnose disease and to treat them appropriately. Illnesses like cancer are indicated through changes in expression value in few genes. For instance, healthy cells can turn into cancer cells through genetic mutation. Such change impact the expression levels of genes. Gene expressions refer to the procedure of copying genes' DNA sequences into RNA[2]. The expression level of gene denotes the basic quantity of copies of the genes' RNA generated in cells as well as is associated with the quantity of the associated proteins.

Several data mining algorithms which are built for micro-array genes expression data handles the clustering issue. Cluster analyses of genes expression data is proven as a beneficial tool to identify coexpressed genes. Every entrant in the environment is a metric of the appearance levels of a specific gene for a particular condition. Examining such datasets reveal genes of unfamiliar purposes as well as help to discover the functional relations among genes. Coexpressed genes may be collected into clusters on the basis of their appearance patterns of a gene. It is possible to achieve clustering through genes as well as models.

In gene grounded clustering, genes are conserved as objects and examples as attributes. In gene based clustering, the examples may be separated into homogeneous sets so that genes are observed as attributes whereas examples as objects. Clustering is relatively an unverified learning technique in which the substances under a subset of characteristics are clustered. Through clustering, individual objects are assigned into multiple groups[3]. Co-expressed genes with analogous expression designs may be clustered together that have same meanings.

The latest progress in DNA microarray technology allows obtaining gene expression profiles of tissue samples at comparatively lesser cost. Most of the scientists worldwide utilize the benefit of gene profiling to differentiate complicated biological circumstances as well as diseases [4]. Microarray methods, which are utilized in examining genome-wide, gene expression as well as genome mutation, assist scientists as well as physicians in comprehending the patho-physiological mechanisms used in diagnoses, prognoses as well as in selecting treatment plans.

Genes selection is a significant part for genes expression based tumour classification systems. The most beneficial aspect of microarray is that it can efficiently monitor the expression of large number of genes as well as offer biological information that are of great importance. Identifying the distinguished genes is very important and needs utmost attention [5]. Top ranking genes are thoroughly studied while the results support several research works in biology as well as medicine leading to many beneficial discoveries in cancer study. Medical diagnostic examinations that examine the existence of a given protein in serum can be attained through small subset of discriminant genes. Further, presence of supplementary feature will add on to the discriminating power of the genes. However, there are quite a few reasons to minimize the quantity of attributes to a sufficient minimum.

Clustering refers to the procedure of determining sets of objects so that the objects within a group are analogous to each other while it is dissimilar from the objects in other sets. An excellent clustering approach can create superior quality

Bacterial Foraging Optimized Fuzzy C Means Clustering for efficient disease prediction

Banumathy D.[1]* and Selvarajan S.[2]
1. Assistant Professor, Department of CSE, Paavai Engineering College, INDIA
2. Principal, Muthayammal College of Engineering, INDIA
*banumathydhanabalanpec@paavai.edu.in

Abstract
An early diagnosis of disease is preferred. K-means is a famous hard clustering algorithm that splits data objects into k clusters wherein the quantity of clusters wherein the quantity of clusters, k, is determined previously as per the application purpose. Fuzzy c-means clustering is an efficient protocol, however, the arbitrary selection in center points makes the repetitive procedure forcing into local optimum solution with ease. Bacterial Foraging Optimization protocol (BFOA) on the basis of the behaviour of biologically inspired E-coli bacteria, used to find optimal solution. E-coli bacteria search for rich nutrients in the search space by using their energy per unit time. The common characteristic bacteria's are grouped together. The bacterium can communicate with each other by sending signals. In this work, Hybrid Bacterial Foraging Optimization protocol - Fuzzy C-Means Clustering (BFO-FCM) method is proposed.

Keywords: K-means Clustering, Fuzzy c-means clustering (FCM), Bacterial Foraging Optimization Algorithm (BFOA) and Hybrid Bacterial Foraging Optimization Algorithm - Fuzzy C-Means Clustering (BFO-FCM).

Introduction

In today's world, technology is a critical component of healthcare. Of course, all healthcare comprises of mortal collaboration, the solicitation of tools, or, typically, both. Technology is significant in all examinations of the organization as well as functions of healthcare service as well as system for several reasons. Knowledge is a huge module of modern healthcare cost as well as possibly the primary drive of future costs. The main regulatory framework as well as organizations are present only to cope with the overview as well as usage of safe, efficient as well as secure technology in healthcare. Improvements in healthcare knowledge are possible huge sources of economic wealth and forces for changes in the organization of healthcare.

Data Mining refers to the procedure of identifying the related information according to the input query from a large set of data sets. Clustering typically is an unsupervised procedure that groups elements together such that the clusters[1] designated to one cluster are more like one another than the other data points. The motivation for the choice resides in the fact that possessing a greater number of dimensions typically results in the curse of dimensionality, wherein the performance of several standard machine-learning protocols is affected. This is almost always because of 2 pervasive impacts: empty space as well as the concentration of distance. The former is where all the higher-dimensional datasets are sparse as the quantity of points needed for denoting distributions increases exponentially with the quantity of dimensions. This results in poor density estimate for higher-dimensional data, leading to problems for density-based methods. Concentration of distances refers to a counter-intuitive characteristic of higher-dimensional data representation, wherein every distance between data points tends to turn more difficult to differentiate when dimensionality rises leading to issues with distance-based protocols.

The high-dimensional clustering can be applied in a variety of ways and can be adapted to the problem of decision making[2]. The decisive support system is one which provides support to the clinical process, and there are many decisive support systems which works based on symptoms provided. The symptoms based decisive support systems, generates recommendations on different diseases according to input symptoms given. Similarly, the decisive support systems can use the high dimensional data set to perform such recommendations.

The intelligent support system is one, which generates knowledge for the decision-making process. The decisive support system can use the grouped information to perform decision making. For example, by grouping the similar data points of different disease class, the similarity to the input data point can be computed. By calculating the similarity of data points, the user disease can be easily identified by the medical practitioner. Feature selection algorithm[3] iteratively chooses a sub-set of the original features known as a candidate sub-set and measures the optimality of the candidate sub-set utilizing evaluation functions. Thereby, features selection method decreases data dimensionality, discards non-relevant data, increases learning accuracy, as well as enhances results comprehensibility. Features selection protocols are either filter or wrapper models. The former depends on generic characteristics of the training data for selecting some attributes with no involvement of any learning protocols. Wrappers need a pre-determined learning protocol in features selection and use their performance to evaluate as well as determine the features that are chosen.

Clustering refers to the procedure of assignment of data objects to a set of disjoint groups known as clusters such that objects in all clusters are like one another more than those

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MULTI VARIANT GENE SELECTION APPROACH BASED HIGH DIMENSIONAL SUB SPACE CLUSTERING OF BREAST CANCER DATA SET FOR EFFICIENT CLASSIFICATION USING FUZZY RULE SETS AND MULTI GENE IMPACT MATRIX

N. MAGENDIRAN[1] and S. SELVARAJAN[2]

[1]Associate Professor / CSE, Paavai Engineering College, Namakkal, Tamilnadu, India

[2]Principal, Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

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ABSTRACT: The breast cancer is the most threatening factor of women's lifestyle and the reason of the disease has many factors, but still the gene factor has more influence in the generation of breast cancer where the early diagnosis and prevention is essential. There are many approaches has been discussed in the literature, but the identification and selection of a set of genes which influence the disease is still complicated one. We propose a multi variant approach for gene selection which is performed by performing high dimensional subspace clustering. With the given data set, the method generates a set of rules and unlike generic fuzzy rules the method splits the range values into the number of parts and based on that the rules are generated. Also, according to the different range values, the method generates a multi gene impact matrix where the frequency of range values of each rule is stored. The data set is clustered according to the generated rules and from the generated rules the gene selection is performed. For the gene selection, we compute the multi gene frequency measure which represents how depth the gene has an impact on the classification of disease. The proposed method produces efficient classification of genes in the influence of breast cancer and produces efficient results.

KEYWORDS: Gene Selection, High Dimensional Clustering, Multi Gene Impact Matrix, Fuzzy Rule Sets.

1 INTRODUCTION

The growth of data sets in, their dimension increases the challenges in clusters them, where the higher dimensional space requires more sophisticated approaches to cluster the data sets. In any high dimensional space, identifying the subspace is the most important task which has to be performed in an efficient manner. For a breast cancer data set there are a number of genes influencing or taking part in the appearance of the cancer in the women. To identify them or to cluster such data set the genes are the most important factor which participates in the clustering approach.

Gene selection in high dimensional breast cancer data set clustering is the most important task and how the gene selection is performed is the big question here. Not all the genes have a great impact, but all the genes has some impact in the cause of breast cancer. To find a strategic approach to selecting the gene selection there must be some efficient approach to be there. Unfortunately the existing approach misses the case of gene selection in a modern sophisticated approach and has no efficient solution to perform the task of gene selection.

The breast cancer can be classified into many cases and to identify the exact subspace we must come up with more efficient measures and gene selection approaches. For example, a subset of genes may be the cause of a specific type of cancer, but they may not have any impact in the presence of another type of cancer. So the gene selection is the most important task which could be used to predict the future appearance of breast cancer. So for the prediction of the breast cancer the gene selection approach can be used which helps early detection and cure of cancer in many ways.

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Substantial Gene Selection in Disease Prediction based on Cluster Centre Initialization Algorithm

N. Magendiran*; Dr. S. Selvarajan**

*Associate Professor, Paavai
Engineering College,
Namakkal, Tamilnadu, India.

**Principal, Muthayammal College of
Engineering,
Rasipuram, Tamilnadu, India.

Abstract

Microarrays are complete it possible concurrently have number of gene in condition based apperance and monitor. Credentials of co-expressed genes and bright patterns is the principal goal in microarray or gene appearance data scrutiny and is a significant task in Bioinformatics investigation. In this paper, K-Means algorithm hybridized with Cluster Centre Initialization Algorithm (CCIA) is planned Gene Expression Data. The expected algorithm overcomes the problems of requiring the number of collections in the K-Means approaches. The method decides on a set of essential high-class genes from the dataset based on their correspondences which are computed using average association value the clusters which earn the higher average connection value is considered as significant groups, whose ordering accuracy will be equal or great when associating to the accuracy of the whole dataset. Finally, from the new results, it is long-established that the genes selected by the planned approaches are quite promising in classification and also are purely relevant to cancer.

Keywords: Average correlation value, K-means Methods, CCIA, Gene Selection

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Finding Intensity of Disease by Fuzzy Learning Rules (FLR) based Intelligent Decisive Support System for Efficient Disease Prediction

D. Banumathy*; Dr. S. Selvarajan**

*Assistant Professor,

Paavai Engineering College,

Namakkal, Tamilnadu, India.

**Principal,

Muthayammal College of Engineering,

Rasipuram, Tamilnadu, India.

Abstract

Experimental analysis is frequently done by doctor's expertise and involvement. But still, cases are testified of incorrect diagnosis and action. Patients are demanded to take some tests for examination. In many belongings, not all the tests contribute towards efficient analysis of a disease. Three classifiers similar Naive Bayes, Ordering by clustering and decision tree are used to calculate the analysis of patients with the same accuracy as acquired before the discount of some attributes. Fuzzy learning rules (FLR) are generally applied for finding the intensity of disease in data sets. Fuzzy learning rules better compared to other three methods. We propose a fuzzy learning algorithm to determine relationships between data resources based on their disease attributes, as well as to characterize knowledge through the connotation of disease covered by those properties. The algorithm addresses the significant problem of important a suitable number of clusters for suitably catching all the diseases of the knowledge domain. Using fuzzy rule-based classification system, the proposed system proves to improve the classification accuracy.

Keywords: FLR, Disease prediction, Clustering, classifiers, mining.

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HIGH DIMENSIONAL K^N-FAST CLUSTERING BASED INTELLIGENT DECISIVE SUPPORT SYSTEM FOR EFFICIENT DISEASE PREDICTION USING DATA MINING AND RULE SETS

D. BANUMATHY[1] and S. SELVARAJAN[2]

[1]Assistant Professor / CSE, Paavai Engineering College, Namakkal, Tamilnadu, India

[2]Principal, Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

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ABSTRACT: The methods of high-dimensional clustering have been applied for variety of problems and in case of decisive support systems, there are few approaches discussed earlier, but suffers with the problem of false indexing ratio with poor clustering accuracy and higher time complexity. To overcome the issue of poor clustering accuracy, a novel K^n Fast Clustering algorithm is discussed in this paper. The method generates rule sets using the data records from the data set. First the dimension N is identified and for each dimension the range values are identified. From identified fuzzy values, the method computes disease impact factor for each of the dimension or symptoms towards each disease class. Based on the impact factor and the data points, we generate rule sets that consist of a single rule for each of the disease class. The K^n Fast clustering algorithm uses the fuzzy rule sets generated and for each data point from the data set, the clustering algorithm computes K^N dimensional similarity measure. Based on computed similarity measure, the data points are assigned a class, and the method reduces the false indexing, overlapping, and time complexity of clustering.

KEYWORDS: High-Dimensional Clustering, Decisive Support System, Disease Prediction, Data Mining, Rule Sets.

1 INTRODUCTION

The problem of clustering high dimensional data set has been adapted in many situations. Clustering data points with a small size can be done in an easier way by computing similarity measure between the data points of a different class of data points. The problem becomes tougher when the size of dimension grows and computing the similarity measure between data point also becomes difficult. This introduces a false indexing ratio, and the same data point may be assigned with multiple class names, where the similarity between data points has to be computed by considering all the dimensional values.

The high-dimensional clustering can be applied in a variety of ways and can be adapted to the problem of decision making. The decisive support system is one which provides support to the clinical process, and there are many decisive support systems which works based on symptoms provided. The symptoms based decisive support systems, generates recommendations on different diseases according to input symptoms given. Similarly, the decisive support systems can use the high dimensional data set to perform such recommendations.

The input symptoms set or medical diagnosis results can be used to perform disease prediction. Based on the given input symptoms or diagnosis results, the probability or inference about any disease can be performed. For example, for a general fever the symptoms may be of body pain, temperature and cold but differs with the symptoms of Typhoid. For small dimensional symptoms or diagnosis results the prediction of disease can be performed easily but when the size of dimension grows, then the data points has to be clustered in proper manner so that the prediction of disease can be done in an efficient manner.

Corresponding Author: D. BANUMATHY

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Intelligent Decisive Support System for Disease Prediction with Multi Attribute Relational Deapthness Clustering of Breast Cancer Data Set Using Data Mining

[1]D. Banumathy and [2]S. Selvarajan

[1]CSE at Paavai Engineering College, Namakkal, Tamilnadu, India
[2]Principal at Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

Abstract: The problem of high dimensional clustering has been studied in different situations, but the approaches suffer with the problem of false indexing and the implication of clustering can be applied in many problems. We propose a novel approach to support decisive systems and perform disease prediction based on relational depthness measure. The proposed approach uses a multi attribute relational depthness clustering, where the relation between the data points of any cluster is computed based on the relative similarity between various attributes of high dimensional data set. We compute the multi attribute relational depthness measure which represents the relative measure and the bond the data point has with the data points of the cluster. Based on computed multi attribute relational depthness measure used to identify the class of any data point. The proposed method improves the quality of cluster being generated and reduces the false indexing ratio. To perform disease prediction, the same multi attribute depthness similarity is computed and a set of probability values is computed for each of the disease class available. The proposed method improves the performance of decisive support system and reduces the time complexity also.

Key words: Decisive Support System • Disease Prediction • Multi Attribute Relational Depthness Measure • Data Mining • Clustering

INTRODUCTION

Data Mining is the process of identifying the related information according to the input query from a large set of data sets. The process of data mining can be applied in medical solution where the problem is to group the related medical records into different categories. The identified categories and the medical records can be used to perform many tasks like identifying similar medical records which could be used for analysis.

Intelligent decisive support systems are one which supports the medical practitioners to identify or predict the possible disease according to the medical record provided. To provide support for the decisive systems the related medical records have to be kept in a proper manner. The decisive system may use any measure to perform disease prediction, but the efficiency of the decisive system is highly based on the clustering of records.

Clustering is the process of grouping related or similar records of medical information based on some similarity. The similarity of the records may be computed based on any measure like Euclidean distance. The application of Euclidean distance can be applied only for the limited dimensional data points. But when the dimension of the data point grows, the application of Euclidean distance like measure cannot be applied and needs some other quality measure. Such quality measure has to be identified and formed which supports clustering to be performed in the most effective manner.

The relational measure is one, which represents the bonding or similarity of any two data points according to one to one correspondence. The data point may contain an N number of attributes, but among them a few attribute values are more closure which represent that those data points are related according to that particular property. While grouping high dimensional large data set, it is not necessary that all the properties are

Corresponding Author: D. Banumathy, CSE at Paavai Engineering College, Namakkal, Tamilnadu, India

An Efficient Meta Scheduling based Virtual Consolidation for Resource Sharing in Green Cloud

S. Lavanya Prabha and R. Dhivya

Abstract--- *In modern researchers, cloud parallel data processing has emerging resource that to be one of the problematic application for Infrastructure-as-a-Service (IaaS) clouds. Major Cloud processing companies include starting incorporate frameworks using VM models for parallel data processing in their resource portfolio creation to easy for a client to access these services and to set out their programs. The growing computing requires from multiple requests on the main server has lead to excessive power utilization. The waiting resource in the long-term sustainability of Cloud like infrastructures in provisions of energy cost but also from cloud environmental perspective. The trouble can be addressed to require with high energy consumption resource sharing infrastructures, but in the process of resources are dynamically switch to new infrastructure. Switching is not enough to cost efficient and also need time sharing green consuming. Cloud being consists of several virtual centers like VM's under the different administrative domain, make a problem more difficult. Thus, for the reduction in energy consumption, this propose address the challenge by effectively distributing compute-intensive parallel applications on the cloud. To propose a Meta-scheduling algorithm, this exploits the heterogeneous nature of Cloud to achieve the reduction in energy consumption as the green cloud. This intent addresses these challenges by proposing a virtual file system specifically optimized for virtual machine image storage. It is based on a lazy transfer scheme coupled with object versioning that handles snapshot ting transparently in a hypervisor-independent fashion, ensuring high portability for different configurations.*

Keywords--- *Cloud Computing, Data Centers, Data Distributions, Virtual Machine or Migration.*

I. INTRODUCTION

CLOUD is a centralized resource to share the resource that has a facility to consume scalably, scattered computing environments within the boundaries of resource sharing on the Internet, a practice that shares data in cloud computing. In this innovative world of the computing process, clients are collectively required to recognize the underlying principle of trust. Within the cloud resource sharing environment, the virtual sharing data users access the resources with gained power limits that do not exceed that limited within their individual physical worlds as well as the green cloud. Cloud provides the centralized resource sharing facilities via the internet. And it's provided us better and efficient way to access information promptly and also increases storage of capacity for the user in.

Cloud is a middle ware process for data compelling technology. In clouds, clients can dynamically request or allocate their resources using on-demand service without sophisticated exploitation and supervision of resources sharing. To enabling the key technologies in clouds, they include the Virtual machine processing paradigm VM's migrates the distributed file systems virtualization and so forth for request sharing. These procedures highlight the scalability, so clouds can be huge in extent resource provider, and embrace entities can subjectively be unsuccessful and join while maintaining system reliability for a green cloud. Distributed file structure are basic building blocks using Virtual data sharing in cloud applications based on the Virtual machine programming standard. In this type of file systems, the nodes are simultaneously deliver or share the resources and maintain the storage functions dynamically to request file is divided into switched allocated space in dissimilar nodes. So that Virtual machine tasks can be performed in parallel workloads over the dissimilar nodes. For instance, consider a packet count application that counts the number of dissimilar packets and the frequency of each unique packet that merge in a large data file. Dissimilar files are delivered by different resource and merged by reference Packet. Each storage space nodes (or node for short) then estimate the occurrence of each unique data packets by examining and parsing its confined file portion. In such a dispersed file organization, the weight of a node is characteristically proportional to the number of file chunks the node possesses. Because the files in a cloud can be arbitrarily allot, share, verify and nodes can be upgraded, replaced and added in the file organization the file large portion are not disseminated as uniformly as probable among the nodes. Load balance surrounded by storage nodes is a dangerous function in clouds sharing. In a load-balanced cloud, the possessions can be well exploit and provisioned, exploit the performance of extended Virtual machine-based applications. State-of-the-art distributed file systems in clouds rely on innermost nodes to manage the metadata information of the file systems and to stability the loads of storage nodes based on that metadata. The centralized approach simplifies the design and implementation of a distributed file system.

S. Lavanya Prabha, ME (CSE), Paavai Engineering College, Pachal, Namakkal, Tamil Nadu. E-mail:lavanyaprabhapecme@gmail.com

R. Dhivya, ME., Assistant Professor, Department of CSE, Paavai Engineering College, Pachal, Namakkal, Tamil Nadu

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AN INTEGRATED FRAMEWORK FOR CONTENT – BASED IMAGE RETRIEVAL SYSTEM USING COLOUR CO-OCCURRENCE FEATURES AND BIT PATTERN FEATURES

Dinesh Kumar.A[#1] and Dr. Yoga Priya.J[*2]

[#] *Department of Computer Science and Engineering, Paavai Engineering College,India*

[*] *Department of Computer Science and Engineering, Paavai Engineering College,India*

Abstract— **Content Based Image Retrieval (CBIR) has recently a short time obtained more attention because of its number of applications in image management, medical database and web search. A wide range of solutions have been implemented in the recent past to handle various in CBIR. Semantic Analysis of the image can also be done by quantifying the low level features. In this proposed system, for the generation of image content descriptor, Content Based Image Retrieval (CBIR) take the advantage of low level complexity Ordered – Dither Block Truncation Coding (ODBTC). In the encoding step, ODBTC compresses an Image block into compatible quantizers and Bit map Image. Two image features are proposed to index an image. One is the Color Co-occurrence Feature (CCF) and the other is Bit Pattern Features (BPF). This is creating straight forward through ODBTC encoded data streams without including any decoding process. A CCF and BPF of an image is just a derivation of two ODBTC quantizers and Bit Map, respectively by involving the visual codebook. In these schemes we proposed Support Vector Machine (SVM) as machine learning algorithm can be classifying the quantified extracted feature image. After classification, effective relevant images are retrieved based on the similarity measurement techniques using relative distance. The performance will be analyzed using precision and recall.**

Key words— **Color Co-occurrence Features (CCF) and Bit Pattern Features (BPF), Content-Based Image Retrieval (CBIR), Ordered Dither Block Truncation coding (ODBTC).**

I. INTRODUCTION

The quick growth of web and information technology has increased the enormous number of images available and so there is a need to store the information in digital forms. In order to manage this large pool of available images, we need to make sure there are effective database management and efficient image retrieval tools to handle them properly. Image retrieval is to search a certain image from any database using any optimal criteria. Mostly images are retrieved based on either its textual features or its visual features. All the semantics of the images will be represented by the Text Based Image Retrieval (TBIR). This holds the condition that the keyword annotations to be perfect. Whenever the text of image is annotated correctly, the image is retrieved from the database using TBIR. The challenge is that when the size of image database increases, the manual annotations becomes a troublesome and expensive process. If the different persons retrieve a particular image, there will be some degree of difference in perceiving the same image. Content Based Image Retrieval (CBIR) system has been proposed to overcome the difficulties of TBIR.

II. PROBLEM DEFINITION

A. Challenges in TBIR

Text Based Image Retrieval (TBIR) falls into the pitfalls whenever the size of the image database increases. Also there is this condition that specifies that the annotations must be correct. This creates a burden over the shoulders of the database user. All human beings are different in perceiving from one another. So when any image database is accessed by multiple users, they perceive it differently from each other.

This can be overcome by a retrieval mechanism that extracts the characteristics of the image and represent the maximum relevant information into the list of features of image.

B. CBIR to overcome the difficulties in TBIR

The CBIR is used to search the image database for similar images automatically, based on the visual features such as color, shape and texture. So, we can use CBIR to perform content descriptor that needed for overcoming the difficulties in TBIR. The initially CBIR system had two steps of image

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ENERGY EFFICIENT FREQUENCY MULTIPLIER FOR SILICON ON CHIP

C.Priya, Dr.R.Arangasamy

PG Scholar, Dept Of VLSI Design, Paavai Engineering College (Autonomous),

Prof and HOD, Dept of Electronics Communication And Engineering, Paavai Engineering College (Autonomous).

Abstract:

A logic gate-based digital frequency multiplication technique for low-power frequency synthesis is presented. The proposed digital edge combining approach offers broadband operation with low- power and low-area advantages and is a promising candidate for low- power frequency synthesis in deep submicrometer CMOS technologies. Chip prototype of the proposed frequency multiplication-based 2.4-GHz binary frequency-shift-keying (BFSK)/amplitude shift keying (ASK) transmitter (TX) was fabricated in 0.13-μm CMOS technology. The TX achieves maximum data rates for BFSK and ASK modulations, respectively, consuming The corresponding energy efficiencies for BFSK for ASK modulations.

Key words: Binary frequency-shift-keying (BFSK) transmitter (TX), class-D power amplifier (PA), energy efficient, frequency multiplication technique.

1. INTRODUCTION

Low-power and low-area transmitter (TX) architectures are essen- tial for short-range communications such as wireless sensor networks, body area networks, and other battery operated applications. These low-power applications have relaxed requirements on phase noise, spectral purity, and other performance metrics of TX, which can be used as an extra degree of freedom in the TX architecture design. Phase-locked loop (PLL)-based TXs are both power and area efficient compared with the conventional mixer-based direct up-conversion TX architectures.

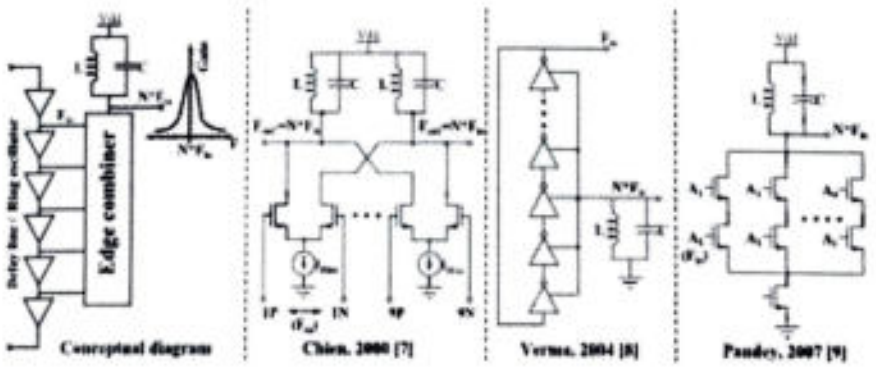

Fig.1. Frequency multiplication circuit techniques

The power consumption in frequency synthesis can be minimized by operating the PLL at lower frequencies and using frequency multiplier circuits outside the loop to generate the up-converted RF carrier The power consumption in frequency synthesis can be minimized by operating the PLL at lower frequencies and using frequency multiplier circuits outside the loop to generate the up-

Segmentation Based Matrix Code for Communication Channel

Mohana .R, Dr.Arangasamy.R
PG Scholar, Professor
Paavai Engineering College, Namakkal

Abstract

The problem of simultaneously broadcasting a common source to multiple receivers over a broadcast channel remains a challenging open problem in network information theory Each receiver is required to partially reconstruct the source sequence by decoding a certain fraction of the source symbols. Our scheme involves splitting the source sequence into multiple segments and applying a systematic erasure code to each such segment. In this project, novel decimal matrix code (DMC) based on divide-symbol is proposed to enhance data reliability with lower delay overhead. The proposed DMC utilizes decimal algorithm to obtain the maximum error detection capability of communication

I. INTRODUCTION

Error detection is the detection of errors caused by noise or other impairments during transmission from the transmitter to the receiver. Summer is another name for error detection Error correction is the detection of errors and reconstruction of the original, error-free data The general idea for achieving error detection and correction is to add some redundancy (i.e., some extra data) to a message, which receivers can use to check consistency of the delivered message, and to recover data determined to be corrupted. Error-detection and correction schemes can be either systematic or non-systematic: In a systematic scheme, the transmitter sends the original data, and attaches a fixed number of check bits (or parity data), which are derived from the data bits by some deterministic algorithm. If only error detection is required, a receiver can simply apply the same algorithm to the received data bits and compare its output with the received check bits; if the values do not match, an error has occurred at some point during the transmission. In a system that uses a non-systematic code, the original message is transformed into an encoded message that has at least as many bits as the original message.

Related Works:

1) Punctured difference set (PDS) codes have been used to deal with MCUs in memories.
2) Interleaving technique has been used to restrain MCUs, which rearrange cells in the physical arrangement to separate the bits in the same logical word into different physical words.
3) Built-in current sensors (BICS) are proposed to assist with single-error correction and double-error detection codes to provide protection against MCUs
4) 2-D matrix codes (MCs) are proposed to efficiently correct MCUs per word with a low decoding delay, in which one word is divided into multiple rows and multiple columns in logical. The bits per row are protected by Hamming code, while parity code is added in each column.

Existing Drawbacks:

1) PDS codes require more area, power, and delay overheads since the encoding and decoding circuits are more complex in these complicated codes.

2) Interleaving technique may not be practically used in content-addressable memory (CAM), because of the tight coupling of hardware structures from both cells and comparison circuit structures
3) BICS technique can only correct two errors in a word.
4) 2D MC is capable of correcting only two errors in all cases.

Rateless codes are a popular class of codes that enable efficient communications over multiple unknown erasure channels at the packet level by simultaneously approaching the channel capacity at all erasure rates. Raptor codes, a special class of rateless codes, also have very low encoding and decoding complexity [3]. Because of these properties, Raptor codes have been standardized for Multimedia Broadcast/Multicast Service (MBMS) and are being deployed in applications such as LTE eMBMS. Raptor codes are essentially optimal for multicast over erasure channels where all receivers require identical content

II. PROPOSED SYSTEM

In this project, novel decimal matrix code (DMC) based on divide-symbol is proposed to provide enhanced memory reliability. The proposed DMC utilizes decimal algorithm (decimal integer addition and decimal integer subtraction) to detect errors. The advantage of using decimal algorithm is that the error detection capability is maximized so that the reliability of memory is enhanced. Besides, the encoder-reuse

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Research Article

An efficient approach for brain image (tissue) compression based on the position of the brain tumor

S. Kumarganesh ✉, M. Suganthi

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ABSTRACT

Medical image processing plays an important role in brain tissue detection and segmentation. In this paper, a computer aided detection of brain tissue compression based on the estimation of the location of the brain tumor. The proposed system detects and segments the brain tissues and brain tumor using mathematical morphological operations. Further, the brain tissue with tumor is compressed using lossless compression technique and the brain tissue without tumor is compressed using lossy compression technique. The proposed method achieves 96.46% sensitivity, 99.20% specificity and 98.73% accuracy for the segmentation of white matter regions from the brain. The proposed method achieves 98.16% sensitivity, 99.36% specificity and 98.78% accuracy for the segmentation of cerebrospinal fluid (CSF) regions from the brain and also achieves 93.07% sensitivity, 98.79% specificity and 97.63% accuracy for the segmentation of grey matter regions from the brain. This paper focus the brain tissue compression based on the location of brain tumor. The grey matter of the brain is applied to lossless compression due to the presence of the tumor in grey matter of the brain. The proposed system achieves 29.23% of compression ratio for compressing the grey matter of the brain region. The white matter and CSF regions of the brain are applied to lossy compression due to the non-presence of the tumor. The proposed system achieves 39.13% of compression ratio for compressing the white matter and also achieves 37.5% of compression ratio for compressing the CSF tissue. © 2016 Wiley Periodicals, Inc. Int J Imaging Syst Technol, 26, 237–242, 2016

Citing Literature

Fetal ECG Extraction using LMS Filter

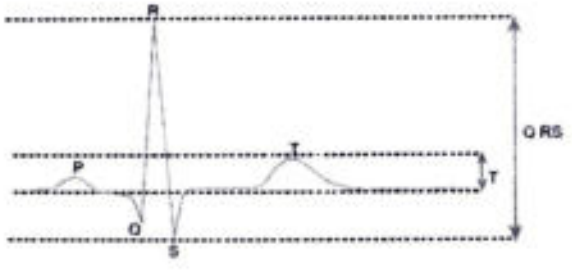
S.V.Vinoth, S.Kumarganesh
PG Scholar, Associate Prof
Paavai Engineering College, Namakkal

Abstract

In this project, proposed a new method for fetal ECG extraction based on wavelet analysis, the least mean square(LMS) adaptive filtering algorithm, and the spatially selective noise filtration (SSNF) algorithm. First, abdominal signal sand thoracic signals were processed by stationary wavelet transform (SWT),and the wavelet coefficients a teach scale were obtained. For each scale, the detail coefficients were processed by the LMS algorithm. The coefficient of the abdominal signal was taken as the original input of the LMS adaptive filtering system, and the coefficient of the thoracic signal as the reference input. Then, correlations of the processed wavelet coefficients were computed. The threshold was set and noise components were removed with the SSNF algorithm.

I. INTRODUCTION

Electrocardiogram (ECG) signals are widely used in health monitoring as a non-invasive way to establish clinical diagnosis of heart diseases. Conventional ECG monitoring systems are based on long-term recording (e.g., using Holter devices) that generate a vast amount of data requiring huge storage and transmission capacity. These devices record data during one to five days of a patient's normal daily life, and they are restricted by patient's mobility, transmission capacity and physical size Unfortunately, the fetal heartbeat signal yielded by this recording technique is quite weaker than the mother heartbeat signal, also due to the attenuation during the propagation caused by the tissues; moreover, many other signals are superimposed to the two heartbeats: artifacts such as mother breathing, uterine contractions, diaphragm, electrical line noise. Because of the low amplitude and the poor SNR, the fECG is hopelessly contaminated by the artifacts, therefore it is quite difficult to extract its shape, it is desirable to extract it and to trust a R-wave (see the Figure 1) extraction procedure as steady as possible towards the artifacts.



The fECG extraction is a typical blind source separation (BSS) problem and the first application of BSS techniques to fECG extraction was done by De Lathauwer etal.

[1], it is well accepted that Independent Component Analysis (ICA) is a suitable tool for separating the fECG "source" from the rest; some different ICA based procedures has been exploited so far: ICA estimated by INFOMAX algorithm [2] (applied to a dataset with eight sensors), ICA by JADE algorithm and a Wavelet-post processing consisting in baseline removal and denoising [3] (applied to five sensors), Singular Value Decomposition (SVD) and ICA by FastICA algorithm [4] (applied to a single channel recording), ICA by MERMAID algorithm [5] (applied to eight channels), a sensor array and electrode selection algorithm for fECG extraction by ICA proposed by F. Vrins et al. [6] (applied to one hundred sensors). we extract fetal ECG from abdominal signal using filtering techniques. Here, we use thoracic signal as reference signal for fetal ECG extraction. Fetal ECG extraction is done based on Stationary Wavelet Transform (SWT), the Least Mean Square (LMS) adaptive filtering algorithm and the Spatially Selective Noise Filtration (SSNF) algorithm related work

Dennis M.Healy, Jian Lu proposed Spatially Selective Noise Filtration technique for noise removal based on the direct spatial correlation of the wavelet transform at several different scales. The direct spatial correlation of wavelet transform contents at several adjacent scales enhanced major edges in the wavelet transform domain while the noise and small features were suppressed

Ali Khamene,presented a method for extraction of fetal ECG from the composite abdominal signal based on the detection of the singularities obtained from the composite abdominal signal using the modulus maxima locations of the abdominal signal are used to discriminate between maternal and fetal ECG signals. A reconstruction method is utilized to obtain fetal ECG signal from the detected fetal modulus maxima.

Jonathon A proposed an efficient method for extraction of fetal ECG based on sequential source separation in the wavelet domain. The distribution of the wavelet coefficients of the source signals is

QCA Design of Encoder for Low Power Memory Applications

K.Bharathi, S.Vijayakumar
PG Scholar, Associate Prof
Paavai Engineering College, Namakkal

Abstract

A decoder is important component of memory, for address decoding and encoding. The size of Complementary Metal Oxide Semiconductor (CMOS) transistor keeps shrinking to increase the density on chip in accordance with Moore's Law. The scaling affects the device performance due to constraints like heat dissipation and power consumption. A Quantum dot Cellular Automata (QCA) is an alternative to CMOS.QCA offers higher speed, lower power consumption and higher density. In non reversible gates some amount of power loss is involved. Interest in reversible logic offers reduced heat dissipation and increases the speed. It is a new transistor-less computation in nanotechnology. In this project propose a reversible gate based decoder architecture. It provides reversibility and area minimization. QCA designer tool has been used to validate the performance of reversible decoders.

I. INTRODUCTION

The increasing demand for low-power very large scale integration (VLSI) can be addressed at different design levels, such as the architectural, circuit, layout, and the process technology level. At the circuit design level, considerable potential for power savings exists by means of proper choice of a logic style for implementing combinational circuits. This is because all the important parameters governing power dissipation—switching capacitance, transition activity, and short-circuit currents—are strongly influenced by the chosen logic style. Depending on the application, the kind of circuit to be implemented, and the design technique used, different performance aspects become important, disallowing the formulation of universal rules for optimal logic styles. Investigations of low-power logic styles reported in the literature so far, however, have mainly focused on particular logic cells, namely full-adders, used in some arithmetic circuits.

VLSI fabrication process keep on shrinking the physical sizes down to atomic scale dimensions and the operational frequencies of terahertz can be easily obtained if the devices can operate with less no. of electrons. However, there is a need for a trade-off to be made between increasing requirements of performance parameters and the feature size. The eventual saturation of CMOS technology is not due to inability to reduce its physical size further, but the detrimental effects of quantum mechanical effects on tiny transistors. for e.g., In nanoscale transistors, impermissible amounts of current leaks due to such highly narrow channels and ultra thin insulating layers.

Nanotechnology is one of the possible alternatives to the stated trade off problem. ITRS report summarized several possible solutions. The possible variants are i) Deltt (double–electron-layer tunneling transistor) developed by scholars at SN labs, ii) SET (single electron transistors) iii) rapid single quantum flux logic, iv0 quantum cellular automata. SET's are a promising technology for non volatile memory.

To the best of our knowledge, the concurrent testing of faults in QCA and QCA-based sequential circuits has not been addressed in the literature. In this paper, we propose novel designs for concurrently testable latches for molecular QCA using conservative reversible logic. Reversible computation in a system can be performed only when the system comprises reversible gates. Reversible circuits do not lose information, and can generate unique output vector from each input vector and *vice versa* (i.e., there is a one-to-one mapping between the input and the output vectors). Landauer has shown that for irreversible logic computations, each bit of information lost generates kT ln 2 joules of heat energy, where k is Boltzmann's constant and T the absolute temperature at which the computation is performed. Bennett showed that kT ln 2 energy dissipation would not occur if a computation is carried out in a reversible way.

In this paper an effective approach to analysis and design of priority encoder with reversible NAND gate using quantum dot cellular automata is explored in nanoscale. This paper we use the majority gates is the fundamental component of the QCA circuit implementation. The proposed encoder circuit is designed and simulated using quantum dot cellular automata designer tool and also this simulator tool is more useful for building a complex priority encoder input levels. The proposed structure of encoder required only less number of majority gate functions compared to previous structures.

Back Pressure Algorithm with CBDS

S.Jotheeshwaran, A.Kumaravel
PG Scholar, Assistant Prof
Paavai Engineering College, Namakkal

Abstract

In mobile ad hoc networks (MANETs), a primary requirement for the establishment of communication among nodes is that nodes should cooperate with each other. In the presence of malevolent nodes, this requirement may lead to serious security concerns; for instance, such nodes may disrupt the routing process. In this algorithm, to protect backpressure algorithm based routing and scheduling protocols against various insider threats. This paper attempts to resolve this issue by designing a dynamic source routing (DSR)-based routing mechanism, which is referred to as the cooperative bait detection scheme (CBDS), that integrates the advantages of both proactive and reactive defense architectures. Our CBDS method implements a reverse tracing technique to help in achieving the stated goal.

Keywords: *Mobile adhoc network, Routing, DSR, CBDS*

I. INTRODUCTION

Mobile means 'moving' and ad-hoc means 'temporary without any infrastructure'[13]. Therefore, a mobile ad-hoc network is made up of group of mobile nodes, which cooperates to communicate with each other without any fixed central base station [7]. A mobile ad hoc network (MANET), sometimes called a mesh mobile network, is a network of mobile devices connected by wireless links. MANET is a kind of point to point transmission type and is a group of mobile nodes communicating with each other by wireless [14]. Due to infrastructure-less nature of the network, routing and network management is done cooperatively by the nodes i.e. the nodes themselves maintains the functioning of the network [8] [9]. The topology of the network varies rapidly and unpredictable over time because of the mobility of the nodes. Besides, the security of MANET has many defects. These threats make the security of MANET lesser than a cable network and produce many security issues. Because the communication of MANET uses the open medium, attacker can easily overhear message that are transmitted. The design of previous routing protocol trusts completely that all nodes would transmit route request or data packets correctly, dynamic topology, without any central infrastructure, and lack of certification authorities make MANET vulnerable to diverse types of attacks [11]. One of common attack is Black hole attack that is a malicious node can attract all packets by using forged RREP to falsely claiming a fresh and shortest route to the destination and then discard them without forwarding them to the destination [11]. This is shown in Fig. 1. Black hole attack is a kind of Denial-of-Service attacks and derive Gray hole attack, a variant of black hole that selectively discards and forwards data packets when packets go through it [10]. Cooperative black hole attacks mean several malicious nodes cooperate with each other and work just like a group. This kind of attack results in many detecting methods fail and causes more immense harm to all network [10].

In this paper we propose CBDS which integrates the Proactive and reactive defense architectures, and randomly establishing a cooperation with adjacent node. The address of the adjacent node is used as the bait destination address, baiting malicious nodes to send RREP reply messages and identifies the malicious nodes by using the reverse tracing program [11]. Finally the detected malicious node is listed in the black hole list and notifies the remaining nodes in the network to halt any communication with them. As a result, my proposed scheme can reduce packets loss that can be cause by malicious nodes and have better throughput [1] [2].

II. RELATED WORK

In this section, we use an example to introduce the backpressure algorithm and its vulnerabilities, then formulate the backpressure algorithm, and finally discuss attack models. The backpressure algorithm [1]–[4] is an optimal routing and scheduling policy that stabilizes packet queues with capability to achieve the maximum throughput. The backpressure algorithm dynamically selects the set of links to activate and flows to transmit on these links depending on queue backlogs and channel rates. In the following, we consider its application to a time-slotted wireless network. Fig. 1 shows an example of how the backpressure algorithm works: nodes A, B, C, and D form a three hop wireless network with two flows. Each node has the same transmission rate and cannot transmit and receive at the same time slot. At a given time slot, the backlog of each node for each flow is illustrated in Fig. 1.

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EECRT: Efficient Energy Conservation Routing Technique for WSN with Node Mobility

[1]M. Sudha and [2]J. Sundararajan

[1]Department of ECE, Paavai Engineering College, Namakkal, India
[2]Department of ECE, Pavai College of Technology, Namakkal, India

Abstract: In recent years, the main research challenge is the issues in wireless sensor networks (WSN). Energy conservation and coverage of the sensor nodes considered as major metrics for the long time survival of sensor networks. In this paper work, proposed an efficient energy conservation routing technique for WSN with node mobility (movable sensor nodes). Furthermore, in this proposed routing technique, two algorithms developed. Namely, Selectively Turning ON/OFF the Sensors (STOS) and Ongoing Routing Table (ORT). Moreover, in STOS, the sensor nodes divided into several sets of scheduling modes (active, standby, hibernate) and let them to perform alternatively, by which conserves extra energy. Consequently, in ORT Ongoing (up to date) data maintained to update and know the detailed information regarding mobile sensor nodes including the factors such as hop count, residual energy (current energy level), threshold energy with the status of the sensor nodes. In connection with ORT, the next sensor node will identified for forwarding the information. Herein concentrated on dynamic network, where all the deployed sensor nodes are in-mobile except base station (BS) or sink node. Nevertheless, the absence or failure of BS, nearest mobile sensor node to the BS will act as BS. Provided, Simulation result shows that the proposed technique will be enough competent for maximizing the energy conservation.

Key words: Wireless · Sensor Networks (WSN) · Ongoing Routing Table (ORT) · Energy Conservation · Coverage · Mobile Sensor Node (MSN)

INTRODUCTION

Advances in wireless sensor networks becomes a major key technology for several applications such as Security surveillance, intelligent home, animal health and behavior monitoring, weather monitoring, forest fire detection, structure health monitoring and Industrial process control [1-3] etc. Consequently, the deployments of autonomous sensor nodes which may work co-operatively for completing a specific set of tasks are maximum in WSN. Furthermore, the energy conservation considered as major important parameter by reason of the sensor nodes having limited battery power, where it's used to sense, communicate and data process as shown in Figure 1. Nevertheless, from the sensor network, the sensed data by the mobile sensor node will transfer to a sink node (BS), where it will send to the ending user via server.

The subsequent units are the parts of the general wireless sensor network. Moreover, it consists of five major units. Namely, sensor unit, processor unit, transceiver unit, power supply unit and power generator unit. Herein, will concentrate on first four units in proposed work.

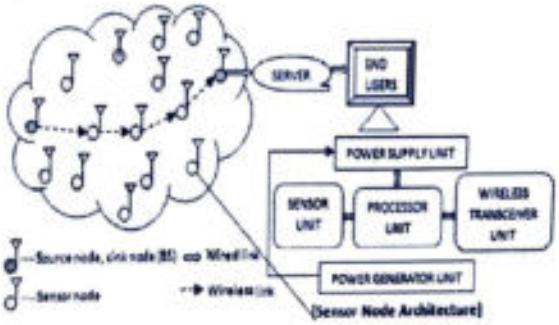

Fig. 1: General WSN

Sensor Unit: Sensor unit consists of several sensor nodes, also known as a mote which will employ to perform some sensing, processing, gathering information and communicating with further sensor nodes in the network.

Corresponding Author: M. Sudha, Department of ECE, Paavai Engineering College, Namakkal, India.

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A Semi-Automatic Segmentation Approach for Kidney Stone Detection in Ultrasound Images

T. Loganayagi
Department of Electronics and Communication Engineering, Selvam College of Technology, Namakkal, Tamil Nadu, India

Abstract: Ultrasound imaging is a non-invasive and inexpensive technique for detection of kidney stones. As the ultrasound images are affected by speckle noise, the segmentation of the images remains a challenging task. The manual detection and measurement of segmented stones become cumbersome and suffers from inter-observer variability. Hence, a computer aided algorithm is required for automatic stone detection and reproducibility with robust despeckling and segmentation techniques. In this study, an algorithm is developed by using Adaptive Bilateral Filter (ABF) for reducing speckle noise and mathematical morphological operations for segmentation of stones in ultrasound kidney images. The speckle reduction performance of ABF is evaluated byPeak Signal to Noise Ratio (PSNR), Structural Similarity Index Metrics (SSIM) and Edge Preservation Index (β).The proposed stone detection algorithm is analyzed through Pratt's Figure of Merit (FOM).

Key words: Ultrasound images, kidney stone, adaptive bilateral filter, sobel edge detection, morphological operation

INTRODUCTION

The prevalence of kidney stone is a most common problem in human urinary system (Fwu *et al*., 2013; Moe, 2006; Rafiei *et al*., 2014; Romero *et al*., 2010; Zayid *et al*., 2014). Kidney stones consist of various organic and inorganic substances such as calcareous, uric acid, cysteine, struvite and ammonium acid combined with proteins (Moe, 2006). The kidney stones can be inferred with various pathophysiological symptoms like lumbar discomfort and dysuria. Conversely certain non-calcareous stones have singular pathophysiology whichis not adequate for any diagnostic and therapeutic efforts. However, due to less common physiological symptoms, the clinicians depend on various medical imaging procedures like sonogram, radiograph or Computed Tomography (CT). The use of CT in kidney stone detection provides accurate diagnostic information (Fwu *et al*., 2013; Khan *et al*., 2004). But the repeated use of CT diagnostic for patient with renal calculi contributes to an increased exposure of radiation (Fwu *et al*., 2013). B-mode ultrasound is the best medical imaging technique compared to CT, (Magnetic Resonance Imaging) MRI, etc., concerning their ability of providing good anatomical details of kidney in a short period, absence of radiation, no usage of contrast agent, safe to obstetric patients and low-cost (Khan *et al*., 2004). However, the visualization of ultrasound images is affected by speckle noise. The characterization of speckle is a bright non-calculus echo present in ultrasound images which mimics as renal calculi (Khan *et al*., 2004). The ultrasound stone images are mainly characterized by its large reflectivity. If the size of the stone is dense and large, the echo beam intensity will be higher and the stone looks brighter than the surrounding tissues. The sensitivity of ultrasound imaging is higher (nearly 100%) in detection of large and dense calculi. The challenge for ultrasound imaging is the detection of smaller non shadow calculi.

Mitterberger *et al*. (2009) addressed the kidney stone detection problems in ultrasound image usinga comparative analysis with Doppler ultrasound. This analysis is helped in this work to understand twinkling artifacts caused by the speckle noise. Nirali *et al*. (2014) discussed thespeckle filtering and enhancement techniques to improve the image quality and their performances. This information was advantageous in understanding the existing filtering and enhancement techniques. Tomasi and Manduchi (1998) proposed an edge preserving, non-iterative Bilateral Filter (BF) for gray and color image with additive Gãussian noise. This filter property was essential in case of medical ultrasound images. Bhonsle *et al*. (2012) utilized the Bilateral filter for various medical images including X-ray, MRI, CT and ultrasound considering the smoothing of Gaussian noise. It was proved that the performance of bilateral filter is better than the linear filters and removes the noise in the

High Error Tolerant Erasure Channel for Segment Based Communication

R.Mohana and Dr.R.Arangasamy

Abstract – **The problem of simultaneously broadcasting a common source to multiple receivers over a broadcast channel remains a difficult open drawback in network data theory Each receiver is needed to part reconstruct the supply sequence by decipherment an explicit fraction of the supply symbols. Our theme involves ripping the supply sequence into multiple sections and applying a scientific erasure code to every such segment. During this project, novel decimal matrix code (DMC) supported divide-symbol is projected to boost knowledge responsibleness with lower delay overhead. The projected DMC utilizes decimal formula to get the most error detection capability of communication**

Index Terms--**DMC, Segment based, Communication, Broadcasting**

I. INTRODUCTION

Error detection is that the detection of errors caused by noise or different impairments throughout transmission from the transmitter to the receiver. Summer is another name for error detection Error correction is that the detection of errors and reconstruction of the initial, error-free information

The general plan for achieving error detection and correction is to feature some redundancy (i.e., some further data) to a message that receivers will use to visualize consistency of the delivered message, and to recover information determined to be corrupted. Error-detection and correction themes may be either systematic or non-systematic: during a systematic scheme, the transmitter sends the initial information, and attaches a hard and fast variety of check bits (or parity data), that are derived from the information bits by some settled algorithmic program. If solely error detection is needed, a receiver will merely apply an equivalent algorithmic program to the received information bits and compare its output with the received check bits; if the values don't match, miscalculation has occurred at some purpose throughout the transmission. During a system that uses a non-systematic code, the initial message is reworked into associate degree encoded message that has a minimum of as several bits because the original message

Related works:

1) Punctured distinction set (PDS) codes are accustomed trot out MCUs in reminiscences.

2) Interleaving technique has been accustomed restrain MCUs, which arrange cells within the physical arrangement to separate the bits within the same logical word into totally different physical words.

3) Constitutional current sensors (BICS) ar planned to help with single-error correction and double-error detection codes to produce protection against MCUs

4) 2-D matrix codes (MCs) ar planned to with efficiency correct MCUs per word with an occasional secret writing delay, within which one word is split into multiple rows and multiple columns in logical. The bits per row are protected by overacting code, whereas parity code is additional in every column.

Existing drawbacks:

1) PDS codes need a lot of space, power, and delay overheads since the secret writing and secret writing circuits are a lot of advanced in these difficult codes.

2) Interleaving technique might not be much employed in content-addressable memory (CAM), due to the tight coupling of hardware structures from each cell and comparison circuit structures

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ENERGY EFFICIENT FREQUENCY MULTIPLIER FOR SILICON ON CHIP

[1]C.Priya, [2]Dr.R.Arangasamy,

[1]PG Scholar, Dept of VLSI, Paavai Engineering College,

[2]Professor, Dept of Electronics And Communication Engineering, Paavai Engineering College.

ABSTRACT:

Now a days the digital signal processing and its classification applications on the energy constrained devices should be supported on the basis of efficiency. Because such applications have to perform highly complex computations especially complex multiplication processes while exhibiting tolerance for a large amount of noise and for computational errors too. So, comparing all the arithmetic computations, improving the energy efficiency of multiplication is critical. In this brief, an energy efficient approximate m bit vedic multiplier is proposed which gives a trade off between computational accuracy and energy consumption. The proposed architecture has reduced area compared to other multiplier architectures which process same number of bits. The reduced architecture area reduces the power consumption. Also the vedic technology adopted for the multiplication reduces the delay further. But the approximate architecture output possess a small amount of computational accuracy which is negligible for DSP applications. .

Keywords: digital signal processing; energy efficient; vedic multiplier; approximate multiplier.

1. INTRODUCTION

For today"s embedded system and mobiles energy consumption is a critical design problem. A lot of efforts have already taken at various levels for improving energy efficiency. Among other arithmetic operations, multiplication is the most time and power consuming operation. It becomes more significant for large operands and complex multiplication. Usually in computing devices for executing the DSP applications and its classifications with more efficiency specialized processors are used. Also many DSP and classification applications are designed to process information which contains large amount of noise. An adaptive pseudo-carry compensation truncation scheme known as PCT scheme is introduced in earlier efforts [4]. On comparing other truncation methods this method yields low error. But the leakage and dynamic power of PCT multipliers are more than other truncated multipliers. Later a novel architecture of multiplier with tunable error characteristics is proposed [5]. The main advantage of the method is that the architecture consumes comparatively less dynamic power. This multiplier is inherently faster and it needs less gate sizing to meet rising frequency constraints. But the drawback of the architecture is that the error rate is a bit high. Then another multiplier called iterative logarithmic multiplier is introduced [6] which uses logarithmic number system. The method follows the Michelle"s algorithm to an extent but it it doesn"t follow the approximation techniques. The iterative logarithmic multiplier can afford many number of

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An Efficient Brain Tumor Segmentation and Detection of MRI Images using Neural Network and Bi-cubic Interpolation

P.Ammani and S.Kumarganesh

***Abstract*– Computer-aided detection systems will enhance the medicine capabilities of physicians and cut back the time needed for correct identification. The image plays a central role within the identification of brain tumors. Associate in Nursing economical pre-processing formula is projected during this paper for brain tumour detection supported digital image segmentation. Brain tumour could also be thought of among the foremost tough tumor to treat as; it involves the organ that isn't solely on top of things of the body. we have a tendency to projected a bi-cubic interpolation approach for brain tumour pre-processing, that gave the sting pattern of brain tumour itself. The cube-shaped convolution interpolation operate converges uniformly to the operate being interpolated because the sampling increment approaches zero, with the acceptable condition and constraints on the interpolation kernel, it is shown that the order of accuracy of the cube-shaped convolution technique is between linear interpolation and cube-shaped splines MAT research lab simulation has been accustomed validate the performance. To compare the performance of the various formula, a check image was zoomed dead set 1/2 the initial size and so the shriveled image is enlarged to its original size by exploitation totally different formula. MAT research lab result shows Bi-cubic interpolation will increase SNR from nineteen.1 to 23.5 significantly.**

***Index Terms* – Magnetic Resonance Imaging, Glioma, Brain Tumor, Brain Tumor Segmentation, Neural Networks.**

I. INTRODUCTION

Brain is a vital a part of the form, that is totally composed of the cells. The growth is going to be occurring in brain. Encase of tumor is unknown. The growth is split into 2 categories: Benign (non-cancerous) and Malignant (cancerous). The primary one is represented as slow growing tumors that may exert damaging pressure however won't unfold into encompassing brain tissue. However, the other is represented as quick growing growth and it's able to unfold into encompassing brain tissue. The foremost common symptoms of a tumor are given below. However, all and sundry might expertise symptoms otherwise. The symptoms ar headache, drowsiness, depression, reduced internal organ and reduced metastasis perform eventually, coma isn't treated. Detection of tumor needs high-resolution brain tomography. Most Medical Imaging Studies and exposure conducted exploitation tomography, antielectron Emission pictorial representation (PET) and X-raying (CT) Scan. Currently a day's tomography systems ar important in medical image analysis. The tomography image shows the clear distinction between the tissues, bones and fluid, therefore it create simple to tell apart the growth half from the image. so as to search out the growth half expeditiously the tomography image ought to be increased properly.

Image pre-processing is a vital and stimulating consider the computer-aided diagnostic systems. In medical image process and notably in growth segmentation task it's important to pre-process the image so segmentation and have extraction algorithmic program work properly. Correct detection and segmentation of the growth results in precise removal of options and classification of person's growths the correct tumor segmentation is feasible if image is pre-processed as per image size and quality.

It is wont to displaying the digital pictures. Tomography pictures are altered by the bias field distortion. When getting digital pictures, image pre-processing techniques are often additional used for region of interest. A pre-processing is performed into take away noise and clean-up the image background. During this stage, preprocessing supported mathematician filter is conferred. The pre-processing stage wont to improve the standard of the pictures and create the remainder stages additional reliable. Afterward

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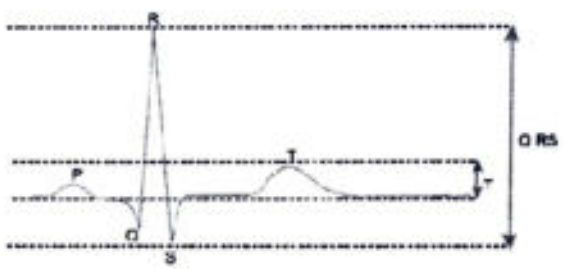
An Efficient LMS and Wavelet Based Fetal ECG Extraction Technique

S.V.Vinoth and S.Kumarganesh

***Abstract* – In this project, projected a new technique for foetal electrocardiogram extraction supported wave analysis, the smallest amount mean square(LMS) adaptational filtering rule, and therefore the spatially selective noise filtration (SSNF) rule. First, abdominal signal sand pectoral signals were processed by stationary wave transform (SWT),and the wave coefficients a teach scale were obtained. For every scale, the detail coefficients were processed by the LMS rule. The constant of the abdominal signal was taken because the original input of the LMS adaptational filtering system, and therefore the constant of the pectoral signal because the reference input. Then, correlations of the processed wave coefficients were computed. the edge was set and noise parts were removed with the SSNF rule.**

I. INTRODUCTION

Electrocardiogram (ECG) signals square measure wide employed in health monitoring as a non-invasive thanks to establish clinical diagnosis of heart diseases. typical EKG observance systems are based on long-run recording (e.g., victimization Holter devices) that generate a huge quantity of information requiring huge storage and transmission capability. These devices record information throughout one tofive days of a patient's traditional way of life, and that they square measure restricted by patient's quality, transmission capability and physical size sadly, the craniate heartbeat signal yielded by this recording technique is sort of weaker than the mother heartbeat signal, additionally as a result of the attenuation throughout the propagation caused by the tissues; furthermore, several alternative signals square measure superimposed to the 2 heartbeats: artifacts like mother breathing, female internal reproductive organ contractions, diaphragm, electrical line noise. attributable to the low amplitude and therefore the poor SNR, the fECG is dispiritedly contaminated by the artifacts, thus it's quite troublesome to extract its form, it's fascinating to extract it and to trust a R-wave (see the Figure 1) extraction procedure as steady as doable towards the artifacts.



The fECG extraction may be a typical blind supply separation (BSS) downside and therefore the first application of BSS techniques to fECG extraction was done by American state Lathauwer et al.

[1], it's well accepted that freelance element Analysis (ICA) may be a appropriate tool for separating the fECG "source" from the rest; therefore me totally different ICA based mostly procedures has been exploited so far: ICA calculable by INFOMAX algorithmic program [2] (applied to adataset with eight sensors), ICA by JADE algorithmic program and a Wavelet-post processing consisting in baseline removal and denoising [3] (applied to 5 sensors), Singular Value Decomposition (SVD) and ICA by Fast ICA algorithmic program [4] (applied to a single channel recording), ICA by imaginary creature algorithmic program [5] (applied to eight channels), asensor array and conductor choice algorithmic program for fECG extraction by ICA proposedby F. Vrins et al. [6] (applied to at least one hundred sensors).we extract foetal graphical record from abdominal signal victimization filtering techniques. Here, we tend to use body part signal as reference signal for foetal graphical record

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An Efficient Brain Tumour Detection Using Region of Interest

G.Jayasree and S.Kumarganesh

***Abstract*—In the medical field analyzing image is vital for several method. In our body several organs area unit gift however brain is incredibly necessary for all operate. Suppose if it affected by any growth that is gift within the brain. For analyzing tumor compression method is required. Here ROI is employed for compression method. ROI provides smart compression. Compression is nothing however to scale back the information while not loss of data that ought to be bestowed within the digital image. During this paper writing, several parameters were analyzed like MSE, PSNR.**

***Index Terms* – Brain Tumour, ROI, Region of Interest, MSE, PSNR**

I. INTRODUCTION

Now a days, human life square measure modified into computerized system. thanks to this info square measure hold on in a very digital kind and it's to be take into account as a sort of information. This method could be a wide field of digital image. It additionally covers the medical pictures. Medical imaging is that the method of making visual representations of the inside human body for clinical analysis and medical intervention. Medical imaging seeks to reveal internal structures hidden by the skin and bones, additionally on diagnose and treat sickness. Medical imaging additionally establishes a information of traditional anatomy and physiology to form it attainable to spot abnormalities. though imaging of removed organs and tissues is performed for medical reasons, such procedures square measure sometimes thought of a part of pathology rather than medical imaging. There square measure 2 styles of compression such as lossy and lossless compression. In lossless compression, the reconstructed image remains the image of the dimensions of the first image, once compression. It will solely come through reserved quantity of compression. This is often additionally known as quiet as it doesn't add noise to the image or signal. this kind of compression used solely with few applications wherever info ought to not be loss as an example medical imaging. Lossless writing additionally referred as entropy writing. Lossy Compression the reconstructed image isn't identical to the first image however moderately near the size of the image. It additionally degrades the image because it utterly discards the redundancy from the signal or image. It additionally results loss of knowledge by mistreatment division method, that types the information into completely different bins and every bin portrayed by a worth, however provides a lot of higher compression magnitude relation. The target of this paper to scale back the bit size while not degraded the image.

II. LITERATURE SURVEY

Medical imaging is one the outstanding application of digital image process. Numerous medical identification techniques square measure mistreatment digital pictures of build. Imaging helps heap of internal drawback occur in human body in visual manner. It's employed in drugs like imaging, CT and X-rays etc. compression is employed in medical field for analyzing internal components of the body. Several techniques square measure employed in compression method. Here ROI is employed for compression method.

III. PROPOSED TECHNIQUE

The brain image is taken for compression technique. in this brain image neoplasm is conferred, this is often taken for segmenting method. Segmentation is nothing however partitioning digital image into multiple segmentation. The purpose of segmentation is to modify illustration of the image. Image segmentation is nothing however find the neoplasm in brain. Here region of interest is employed for compression technique. Once the segmentation method image is affected for compression. Noise additionally removed before the compression. Noise is removed by Gaussian filter technique. Here Huffman computer user is employed for writing method. By mistreatment ROI compression scale back the bit size of image while not moving the opposite components of the photographs.

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An Efficient High Power Node Rejection Clustering Algorithm for WSN

S.Sivaranjani and M.Sudha

***Abstract*– Power heterogeneousness is common in mobile unplanned networks (MANETs). With high-octane nodes, MANETs will improve network quantifiability, property, and broadcasting lustiness WSN will improve network quantifiability, property victimization high power nodes however, the output of power heterogeneous WSN is full of these nodes. to beat this downside, a loose-virtual-clustering-based (LVC) routing protocol for power heterogeneous (LRPH) WSNs is planned .The algorithmic rule aim at making Bi directional links by exploiting the benefits of high-octane nodes. so as to decrease the interference raised by high-octane nodes, routing algorithms ar developed to avoid packet forwarding via high-octane nodes. we have a tendency to demonstrate the system implementation and experimental results through simulations.**

***Index Terms*–Mobile ad hoc networks, LVC, LRPH, Routing**

I. INTRODUCTION

Mobile accidental network (MANET) may be a self-configuring, infrastructure less network of mobile devices connected by wireless and may amendment locations as shown in fig one.1. Nodes in painter will communicate with one another and may move anyplace while not restriction. Quality isn't restricted and characteristics of MANETs square measure simply deployable, so that they square measure very talked-about and appropriate for emergencies, natural disaster and military operations. Movable network consists of devices with completely different characteristics in terms of transmission power; means that it's a capability of lower power nodes to receive transmissions from higher power nodes however reverse isn't true. A cross layer framework offers an easy and effective approach for media access management and supports routing in power varied accidental networks. By this the outturn of the facility varied network is improved by twenty five more than ancient stratified approaches [1].

The benefits of high-energy nodes square measure the growth of network coverage and even have benefits in power and knowledge transmission rate. So, researchers have created efforts to look at these benefits, like backbone construction i.e., virtual backbone is built during a distributed and localized fashion whereas considering several incompatible objectives like quick convergence, and low computation price [2]. Topology management helps in preserving the energy by either reducing transmission power per node or conserving energy-efficient routes for the whole network [3]. But, the massive transmission varies of high power nodes results in large interference that reduces the abstraction utilization of network channel resources. Thanks to completely different transmission power, unidirectional links can occur in MANETs. Thence our aim is to interchange unidirectional links with duplex links. Several routing protocols in power varied MANETs square measure designed solely to seek out the unidirectional links and to avoid the transmissions supported these links while not creating use of the advantages of high-energy nodes. The routing performance of power heterogeneous MANETs ought to be improved by considering the benefits and neglecting the disadvantages of high- power nodes. Hence, during this paper we have a tendency to plan a loose- clustering-based (LVC) routing protocol for power varied MANETs, i.e., LRPH that achieves higher outturn. We have a tendency to build LVC to find unidirectional links by creating use of the advantages of high power nodes. Bunch may be a theme to boost the performance of the network.

So as to attain optimized bunch, a stratified cooperation theme is employed. The amount of stratified stages and also the connected cluster sizes that maximize the overall outturn is chosen. This theme is applied for random networks by developing bunch formula within which the whole network is split into quadrilateral clusters, every with equal range of nodes [7]. Within the existing bunch schemes, every node within the network plays a definite role as cluster head, member, or gateway. Thanks to cluster formation, a stratified routing is completed within which routes square measure recorded between clusters rather than between nodes. So, there's a rise in route period, therefore decreasing the quantity of routing management overhead [8].In our bunch theme, a loose coupling relationship is established between nodes as a result of the price of cluster construction and maintenance decreases. High-energy nodes square measure used for cluster formation however they're avoided for packet forwarding to scale back interference.

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Low Cost Light Weight Sink Relocation Mechanism for WSN

S.Dhanalakshmi and M.Sudha

***Abstract*— Generally in an exceedingly Wireless sensing element Network, sensing element nodes deliver detected information back to the sink via multi-hopping. The sensing element nodes close to the sink can typically consume additional battery power than others; consequently this node can quickly drain out their energy and shorten the network period of the Wireless sensing element Network. Sink relocation is associate degree economical network period extension methodology, that avoids overwhelming an excessive amount of energy for a particular cluster of sensing element nodes. During this paper, we tend to propose moving strategy referred to as Energy aware sink relocation for mobile sinks in Wireless sensing element Networks. The projected mechanism uses the residual energy of sensing element nodes to regulate the transmission vary sensing element and to relocate the sink. Theoretical and numerical analyze ar given to point out that the Energy aware sink relocation methodology will extend the network period of the Wireless sensing element Network considerably. NS2 simulation result shows projected structure improve period with efficiency.**

***Index Terms*-Wireless sensor networks, mobile access coordinator, Network lifetime, Node deployment, cluster head.**

I. INTRODUCTION

A Wireless detector network may be a large-scale network that has to be organized in Associate in Nursing applicable manner, especially for knowledge aggregation. the information aggregation method is meant to balance the load and thereby to increase the network life. The node clump algorithmic rule to be a good method of organizing a network into a connected hierarchy. in a very node-clustering algorithmic rule, several nodes square measure collective to make a bunch. This theme sometimes operates in 2 phases:

- Node cluster setup and
- Cluster maintenance

In the node cluster step up phase, cluster heads square measure designated among these nodes within the network exploitation varied choice schemes, as shown in table one. when the CHs are designated, alternative nodes that square measure stressed with every CH kind clusters. Nodes that don't seem to be a CH square measure known as non-CH nodes. Each CH, acting as a router, transfers knowledge collected from non-CH nodes to the sink node. Within the cluster maintenance part, the cluster configuration is also modified when the initial cluster is ready up owing to node movements or topology changes. Associate in nursing example of node cluster structure is shown in fig.1.

The cluster head node can lose additional drive than a non-cluster head node as a result of it transfers knowledge over longer distances. Hence, to distribute the load uniformly among all the nodes, the network should re-cluster itself sometimes, choosing energy abundant nodes to function CHs. therefore the network can accomplish energy potency, scale back channel rivalry and scale back packet collisions, leading to higher network output underneath high load.

Table 1: Different cluster-head (CH) selection schemes.

CH selection scheme	Characteristics
Stochastic CH election(Heinzelman et al.,2002)	A node is randomly selected without inclusion of the remaining energy level available in each node.
Weighted clustering algorithm(Xuegong et al.,2002)	A node is randomly selected based on its energy level and distance; the number of times the node was selected as the CH is also considered.
Deterministic CH election(handy et al.,2002)	A node is randomly selected with the inclusion of the remaining energy level available in each node.
CH election technioques for coverage preservation(soro and heinzelman,2009)	A node was selected based on a set of coverage-aware cost metrics that favor nodes deployed in densely populated network areas.
Centralized and distributed CH selection(tillapart et al.,2004)	The sink node determines nodes metric(CH) of all nodes in the cluster by taking into account the nodes remaining energy and the total sum of squared distance to every node in the same cluster.
CH selection using fuzzy logic(ki m et al.,2008)	A node was selected based on fuzzy if-then rule.

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A Defence Against Sybil Attack in OLSR Protocol

T. Saranya and A.Kumaravel

Abstract -- **An ad-hoc network is improved methodology of communication that reduces the network overhead. It's a brief infrastructure less network that could be an assortment of mobile nodes within the dynamically kind and freely self-organize into absolute and temporary ad-hoc network topologies counting on their property with one another within the network. Nodes are unceasingly dynamic their locations and conjointly the node functioning depends on the restricted battery capability that's known as energy. This enables peoples and devices to seamlessly inter-network in areas wherever no pre-existing communication infrastructure exists. This network is usually freelance associate degree an isolated network. a collection of mobile nodes which might communicate directly with different nodes inside its transmission array and use multi-hop routing for nodes outside its transmission vary is named Mobile ad-hoc Network (MANETs). All nodes are battery operated, as battery power or battery energy restricted resource so it needs special attention to reduce energy consumption in MANETs. To have a secure communication it's should be a secure network. a very harmful and dangerous attack against mobile ad-hoc network is thought as Sybil attack. It creates a heavy threat to such network. A Sybil assaulter will either produce quite one identity on one physical device so as to launch a synchronic attack on the network or will switch identities so as to weaken the detection method, there by promoting lack of responsibility within the network it's powerfully fascinating to discover Sybil attacks and eliminate them from the network. During this paper, compared the present solutions and mentioned completely different strategies to eliminate the Sybil attack in painter and projected a light-weight theme victimisation the network machine Ns-2 to safeguard the network against Sybil attack while not victimisation centralized sure third party or any extra hardware like aerial or a geographical positioning system. Through the assistance of in depth simulations and real-world work experiments, the simulation results showed that our deviser works higher in mobile surroundings and might discover each join-and-leave and concurrent Sybil attackers. The projected theme detects Sybil identities with smart accuracy even within the presence of quality.**

Index Terms—**Sybil Attack, Ns2, MANET, Ad-hoc Network**

I. INTRODUCTION

MANETs could be a self-organised assortment of mobile nodes that kind a dynamic topology with none mounted infrastructure. Communication on Manet supported distinctive identity of every mobile nodes that customs the one to at least one mapping between associate degree identity associate degreed an entity which is typically assumed either implicitly or expressly by several protocol mechanisms; thence 2 identities infers 2 distinct nodes. however the mischievous nodes will illegitimately claim multiple identities and violate this matched mapping of identity and entity philosophy. Sybil attack is associate degree attack that uses some identities at a time and will increase ton of misjudgments among the nodes of a network or it should use identity of alternative legitimate nodes gift within the network and creates false expression of that node within the network. Like this, it annoys the communication among the nodes of the network. to own secure communication it's necessary to eliminate the Sybil nodes from the network. the subsequent goals should be consummated by security formula wont to sight the attack:

-Authenticity: It means that the exactitude and legality of the node collaborating within the communication.

- Availability: All nodes and their facility should gift all the time.

- Confidentiality: Authorize access should be there for the user.

- Non-repudiation: Sender and Receiver can't deny that they need send the message was 1st introduced by J. R. Douceur. consistent with Douceur, the Sybil attack is associate degree attack within which one entity will management a considerable fraction of the system by presenting multiple identities.

Figure.1 represents a malicious node S beside its four Sybil nodes (S1, S2, S3 and S4). If this malicious node converses with any legitimate node by presenting all its identities, the legitimate node can have delusion that it's communicated with 5 totally different nodes. however in actual, there exists only 1 physical node with multiple totally different IDs.

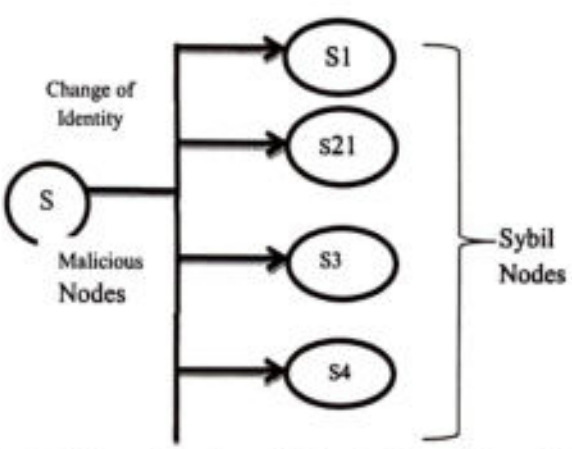

Fig. 1. (Re-produced) a Sybil attacker with multiple identities

A Sybil wrongdoer will cause injury to the unexpected networks in varied ways that. for instance, a Sybil wrongdoer will disturb location-based or multipath routing by taking part within the routing, giving the mix up of being completely different{completely different} nodes on different locations or node-disjoint methods. In name and trust-based actus reus detection schemes, a Sybil node will disrupt the exactitude by increasing its name or

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An Bait Address Based Backpressure Routing for MANET

S.Jotheeshwaran and A.Kumaravel

***Abstract*—In mobile impromptu networks (MANETs), a primary demand for the institution of communication among nodes is that nodes ought to collaborate with every other. Within the presence of malevolent nodes, this demand could cause serious security concerns; for example, such nodes could disrupt the routing method. During this rule, to safeguard backpressure rule based mostly routing and scheduling protocols against varied business executive threats. This paper makes an attempt to resolve this issue by coming up with a dynamic supply routing (DSR)-based routing mechanism, that is said because the cooperative bait detection theme (CBDS), that integrates the benefits of each proactive and reactive defense architectures. Our CBDS methodology implements a reverse tracing technique to assist in achieving the declared goal.**

***Index Terms*—Mobile adhoc network, Routing, DSR, CBDS**

I. INTRODUCTION

Mobile suggests that 'moving' and ad-hoc suggests that 'temporary with none infrastructure'[13]. Therefore, a mobile ad-hoc network is created from cluster of mobile nodes, that cooperates to communicate with one another with none fastened central base station [7]. A mobile unplanned network (MANET), generally known as a mesh mobile network, may be a network of mobile devices connected by wireless links. painter may be a reasonably purpose to purpose transmission sort and may be a cluster of mobile nodes communicating with one another by wireless [14]. owing to infra-structure-less nature of the network, routing and network management is completed hand in glove by the nodes i.e. the nodes themselves maintains the functioning of the network [8] [9]. The topology of the network varies apace and unpredictable over time due to the quality of the nodes. Besides, the safety of painter has several defects. These threats build the safety of painter lesser than a cable network and manufacture several security problems. as a result of the communication of painter uses the open medium, offender will simply catch message that area unit transmitted. the planning of previous routing protocol trusts fully that each one nodes would transmit route request or knowledge packets properly, dynamic topology, with none central infrastructure, and lack of certification authorities build painter liable to various varieties of attacks [11]. one amongst common attack is part attack that's a malicious node will attract all packets by victimization solid RREP to incorrectly claiming a recent and shortest route to the destination then discard them while not forwarding them to the destination [11]. this is often shown in Fig. 1. part attack may be a reasonably Denial-of-Service attacks and derive grey hole attack, a variant of part that by selection discards and forwards knowledge packets once packets bear it [10]. Cooperative part attacks mean many malicious nodes join forces with one another and work rather like a gaggle. this type of attack leads to several detection strategies fail and causes additional large hurt to any or all network [10].

during this paper we have a tendency to propose CBDS that integrates the Proactive and reactive defense architectures, and arbitrarily establishing a cooperation with adjacent node. The address of the adjacent node is employed because the bait destination address, molestation malicious nodes to send RREP reply messages and identifies the malicious nodes by victimization the reverse tracing program [11]. Finally the detected malicious node is listed within the part list and notifies the remaining nodes within the network to halt any communication with them. As a result, my projected theme will scale back packets loss which will be cause by malicious nodes and have higher turnout [1] [2].

II. RELATED WORK

In this section, we tend to use associate degree example to introduce the back pressure algorithmic rule and its vulnerabilities, then formulate the back-pressure algorithmic rule, and eventually discuss attack models. The backpressure algorithmic rule [1]–[4] is associate degree best routing and scheduling policy that stabilizes packet queues with capability to realize the utmost turnout. The backpressure algorithmic rule dynamically selects the set of links to activate and flows to transmit on these links depending on queue backlogs and channel rates. In the following, we tend to take into account its application to a time-slotted wireless network. Fig. one shows associate degree example of however the back-pressure algo-

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Integration of Standalone Solar Power System with Flying Capacitor Multilevel Inverter Contingent on Synchronous Sequential Circuit

Rathinam Angamuthu[1] and Balaji Govindan[2]

[1]*Department of Electrical and Electronics Engineering,*
Paavai Engineering College,
Namakkal, Tamilnadu, India
[2]*Department of Electrical and Electronics Engineering,*
Paavai Engineering College,
Namakkal, Tamilnadu, India

Abstract

The proposed system deals with the conversion of solar power into fundamental AC power by using flying capacitor multilevel inverter controlled by synchronous sequential circuits. The flying capacitor multilevel inverter controls the real and reactive power flow, deep voltage sags and short duration outages. The performance of the inverter is enhanced by using a synchronous sequential circuit, which gives the superior performance by reducing the total harmonic distortion in load voltage and capacitor voltage fluctuations. The synchronous sequential circuit based multilevel inverter offers several advantages like simpler structure, easy fault identification, cost-effectiveness and low power consumption. The performance of proposed strategy has been confirmed through simulation and hardware investigations.

Keywords: *Standalone solar power system, Flying capacitor multilevel inverter, Synchronous sequential circuits, Pulse width modulation, Total harmonic distortion*

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1. Introduction

The total electrical energy consumption is increasing day by day. To meet this increasing demand, the electrical generating capacity has to be increased. Today the new capacity installation decisions are becoming complicated. However, that will need clean coal burning technologies that are fully acceptable to the public. An alternative to the coal burning, nuclear and fossil fuel power is renewable energy (hydro, wind, solar, biomass, geothermal and ocean). Hydroelectric projects have become difficult to realize because of the competing use of land and water. Among the other renewable power resources, wind and solar energy has recently experienced a rapid growth around the world. For remote villages outside two miles from the nearest transmission line, a stand-alone wind and solar energy system could be more economical [1].

After invention of the power electronic semiconductors, the controlling of power became easy in the field of generation, transmission, industrial motors and home appliances etc. The inverters are widely applied in the speed control of induction motors and standalone renewable energy systems like solar, fuel cell, magneto hydro dynamics etc. The two-level inverter has few limitations which are switching losses, constraint in the device rating and the EMI problem. In 1975 the multilevel inverters was introduce, which reduced the drawbacks of the two-level inverter and it has offered high voltage capability, low switching losses and reduced the harmonic. The multilevel inverter converts the DC into the staircase of AC. The staircase AC can be achieved by various

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SYNCHRONOUS SEQUENTIAL CIRCUIT BASED CASCADED MULTILEVEL INVERTER

[1]RATHINAM ANGAMUTHU, [2]RAMANI KANNAN, [3]KARTHIKEYAN THANGAVELU, [4]JIBIN JOSEPH

[1,4]Department of EEE, Paavai Engineering College, Namakkal, Tamilnadu, India
[2]Department of EEE, K.S.Rangasamy College of Technology, Tiruchengode, Tamilnadu, India
[3]Arulmurugan College of Engineering, Karur, Tamil Nadu, India
E-mail: [1]rathnam2020@gmail.com , [2]kreee82@gmail.com , [3]drkarthikeyan@gmail.com , [4]jibinjosephk@gmail.com

ABSTRACT

This paper is focused on the practical and designing aspects of a cascaded multilevel inverter using synchronous sequential circuits. The performance of the inverter has been improved by using a digital logic algorithm for required pulse width modulation. The digital logic algorithm has been exposed to give the superior performance in load voltage and total harmonic distortion. The synchronous sequential circuit based multilevel inverter offer several advantages like simple structure, easy to identify the fault, cost-effective, improved functional performance and low power consumption. The output voltage performance of proposed strategy has been confirmed through simulation and hardware investigations.

Keywords: *Digital Logic Control (DLC), Synchronous Sequential Circuits (SSC), Total Harmonic Distortion (THD), Cascaded Multilevel Inverter (CMLI), Pulse width modulation (PWM).*

1. INTRODUCTION

The multilevel inverters were introduced since 1975. They are popular due to their high-power, high voltage capacity, low switching losses and low cost. A multilevel inverter not only achieves high power ratings, but also enables the use of renewable energy sources. Renewable energy sources such as solar, wind, fuel cells and MHD can be easily interfaced to a multilevel converter system for a high power application [1–4]. The concept of a multilevel inverter to achieve higher power is to use a series of power semiconductor switches with several lower voltage dc sources to perform the power conversion by synthesizing a staircase voltage waveform. Capacitors, batteries, and renewable energy voltage sources can be used as the multiple DC voltage sources.

The multilevel inverter has several advantages over a conventional two-level converter that uses high switching frequency pulse width modulation (PWM). Multilevel converters not only can generate the output voltages with very low distortion, but also can reduce the dv/dt stresses and produce smaller Common-mode voltage [5]. Multilevel converters can operate at both fundamental switching frequency and high switching frequency PWM. It should be noted that lower switching frequency usually means lower switching loss and higher efficiency. Unfortunately, multilevel converters do have some drawbacks. One particular drawback is the greater number of power semiconductor switches needed. Although lower voltage rated switches can be utilized in a multilevel converter, each switch requires a related gate drive circuit. The various topologies of multilevel inverters are cascaded, diode clamped and flying capacitors multilevel inverters [6-9]. The modulation techniques developed for multilevel converters are sinusoidal pulse width modulation (SPWM), selective harmonic elimination (SHE-PWM), space vector modulation (SVM), etc.

The proposed system is focused on the synchronous sequential circuit control of the seven-level cascaded multilevel inverter for standalone system. The clocked sequential circuit is a digital system which contains digital logic devices. This digital logic device produces the PWM pulses to control the seven-level inverter. The proposed system is investigated through simulation and portable hardware model.

2. CASCADED MULTILEVEL INVERTER

The general function of this multilevel inverter is the same as that of two level inverters. The cascaded multilevel inverter synthesizes a desired

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Rathinam Angamuthu[1] and Balaji Govindan[2]

[1]*Department of Electrical and Electronics Engineering,*
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After invention of the power electronic semiconductors, the controlling of power became easy in the field of generation, transmission, industrial motors and home appliances etc. The inverters are widely applied in the speed control of induction motors and standalone renewable energy systems like solar, fuel cell, magneto hydro dynamics etc. The two-level inverter has few limitations which are switching losses, constraint in the device rating and the EMI problem. In 1975 the multilevel inverters was introduce, which reduced the drawbacks of the two-level inverter and it has offered high voltage capability, low switching losses and reduced the harmonic. The multilevel inverter converts the DC into the staircase of AC. The staircase AC can be achieved by various

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Power Generation from the Dynamic Wind Energy available during Maneuvering of Train

G. Balaji*; S. Rathinavel**

*Professor,

Department of Electrical and Electronics Engineering,

Paavai Engineering College,

Namakkal, Tamil Nadu, India.

**Assistant Professor,

Department of Electrical and Electronics Engineering,

Paavai Engineering College,

Namakkal, Tamil Nadu, India.

Abstract

A wind power electricity generation system is the most cost competitive of all the environmentally clean and safe renewable energy sources in the world. This paper brings a new possibility for the utilization of the wind generated power, for various electrical components inside a typical railway train through the batteries charged by the wind energy harnessed by a series of wind turbines mounted near the rest room of each coaches of train coaches. This paper deals with the design and development of a wind turbine system with a concept of generation of electricity as an auxiliary source in the train. Aerodynamics is the study of air flow around a moving object where the dynamics of bodies moving relative to gases, especially the interaction of moving objects with the atmosphere. The aerodynamic profile is formed with a rear side, is much more curved than the front side facing the wind. Thus the movement of wind and its velocity can be studied based on this analysis. The simulation results and the theoretical results are verified.

Keywords: Wind Energy, Wind Turbine, Railway Train.

UPFC BASED DFIG SYSTEM FOR EFFICIENT WIND POWER GENERATION SYSTEM

K.Ramamoorthi[1], Dr.G.Balaji[2]

[1](P.G Student, Dept of EEE, Paavai Engineering College, Namakkal, Tamil Nadu, India, ramamoorthik@gmail.com)

[2](Professor, Dept of EEE, Paavai Engineering College, Namakkal, Tamil Nadu, India, rahullaagi@gmail.com)

Abstract— *The paper presents rapid growth of wind power systems worldwide will likely see the integration of large wind farms with electrical network that are series compensated stable transmission of bulk power. This paper presents an UPQC control and independent operation of the rotor-side converter (RSC) and grid-side converter (GSC) for a doubly fed induction generator (DFIG)-based wind energy conversion system under unbalanced grid voltage conditions .The proposed method can make the RSC and GSC available to an independent operation with a simple implementation for higher reliability with UPQC control. Four-wire Unified Power Quality (UPQC) to improve power quality of wind energy conversion system (WECS). The UPQC is realized by the integration of series and shunt active power filters (APF) sharing a common dc bus capacitor the experimental results demonstrate the effectiveness of the proposed control strategy for both the RSC and GSC under unbalanced grid voltage conditions. MATLAB simulation result shows proposed system improves stability considerably.*

Keywords—wind energy conversion system (WECS), doubly fed induction generator (DFIG), unbalanced grid voltage, independent operation, and resonant regulator.

1. INTRODUCTION

Wind turbines utilize a doubly-encouraged acceptance generator (DFIG) comprising of an injury rotor enlistment generator and an AC/DC/AC IGBT-based PWM converter. The stator winding is associated straightforwardly to the 50 Hz lattice while the rotor is sustained at variable recurrence through the AC/DC/AC converter. The DFIG innovation permits removing greatest vitality from the twist for low twist speeds by enhancing the turbine speed, while limiting mechanical weights on the turbine amid blasts of wind. The ideal turbine speed delivering greatest mechanical vitality for a given wind speed is corresponding to the wind speed. Another preferred standpoint of the DFIG innovation is the capacity for power electronic converters to create or retain responsive power, in this way dispensing with the requirement for introducing capacitor banks as on account of squirrel-confine enlistment generator.

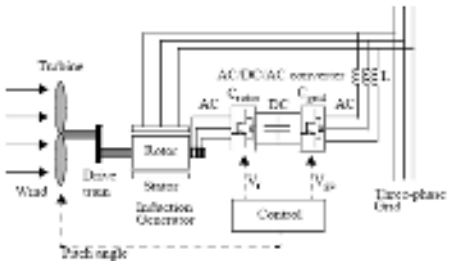

Fig.1. Essential outline of DFIG with converters.

Where Vr is the rotor voltage and Vgc is grid side voltage. The AC/DC/AC converter is basically a PWM converter which uses sinusoidal PWM technique to reduce the harmonics present in the wind turbine driven DFIG system. Here Crotor is rotor side converter and Cgrid is grid side converter. To control the speed of wind turbine gear boxes or electronic control can be used.

An AC-DC-AC converter is included in the induction generator rotor circuit. The power electronic converters need only be rated to handle a fraction of the total power –the rotor power – typically about 30% nominal generator power. Therefore, the losses in the power electronic converter can be reduced, compared to a system where the converter has to handle the entire power, and the system cost is lower due to the partially-rated power electronics. This chapter will introduce the basic features and normal operation of DFIG systems for wind power applications basing the description on the standard induction generator. Different aspects that will be described include their variable-speed feature, power converters and their associated control systems, and application issues.

2. RELATED WORKS AND DFIG-BASED WECS

This section presents an independent operation of the rotor-side converter (RSC) and grid-side converter (GSC) for a doubly fed induction generator (DFIG)-based wind energy conversion system under unbalanced grid voltage conditions. In this paper, the RSC is controlled to achieve four different control targets, including balanced stator current, sinusoidal rotor current, smooth stator active and reactive powers, and constant DFIG electromagnetic torque. The GSC is commanded to keep the dc voltage at a constant value. Additional feedback compensators using resonant regulators for the RSC are employed, and the decompositions of the positive and negative sequence components and calculations of the rotor negative current references can be avoided. Another similar compensator is used in the GSC to suppress the dc voltage fluctuates and remove the GSC reactive power oscillations without the stator or rotor power information. This method can make the RSC and GSC available to an independent operation with a simple implementation for higher reliability.

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A STATCOM-Control Scheme for Grid Connected Wind Energy System for Power Quality Improvement using PI Controller

G.Balaji*; A.Sibichakravarthy**

*Department of Electrical and Electronics Engineering,

Paavai Engineering College,

Namakkal.

**Department of Electrical and Electronics Engineering,

Paavai Engineering College,

Namakkal.

Abstract

The grid-connecting wind energy generation system for power quality improvement by using STATCOM-control scheme is simulated with the help of MATLAB When the wind power is connected to an electric grid affects the power quality. The effects of connecting wind turbine into the grid system covers power quality areas are the active power, reactive power, harmonics and variation of voltage, and electrical performance of switching operations. The installation of wind system with the grid creates the power quality problems which can be determined by studying this paper. By using the Static Compensator (STATCOM) with using. battery energy storage system (BESS) at the point of common coupling to improving the power quality of the grid The battery energy storage used to keep real power from varying wind power. At lower power demand hours the generated power can be stowed in the batteries. The combination of battery storage with wind energy generation system will even out the grid system by absorbing or injecting reactive power and enable the real power flow essential to the load. This recreates the main supply source from the reactive power demand of the load and induction generator in this proposed scheme.

Keywords: International electro-technical commission (IEC), power quality, wind generating system (WGS), battery energy storage system, STATCOM.

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Power Generation from the Dynamic Wind Energy available during Maneuvering of Train

G. Balaji*; S. Rathinavel**

*Professor,

Department of Electrical and Electronics Engineering,

Paavai Engineering College,

Namakkal, Tamil Nadu, India.

**Assistant Professor,

Department of Electrical and Electronics Engineering,

Paavai Engineering College,

Namakkal, Tamil Nadu, India.

Abstract

A wind power electricity generation system is the most cost competitive of all the environmentally clean and safe renewable energy sources in the world. This paper brings a new possibility for the utilization of the wind generated power, for various electrical components inside a typical railway train through the batteries charged by the wind energy harnessed by a series of wind turbines mounted near the rest room of each coaches of train coaches. This paper deals with the design and development of a wind turbine system with a concept of generation of electricity as an auxiliary source in the train. Aerodynamics is the study of air flow around a moving object where the dynamics of bodies moving relative to gases, especially the interaction of moving objects with the atmosphere. The aerodynamic profile is formed with a rear side, is much more curved than the front side facing the wind. Thus the movement of wind and its velocity can be studied based on this analysis. The simulation results and the theoretical results are verified.

Keywords: Wind Energy, Wind Turbine, Railway Train.

High performance humidity sensing properties of indium tin oxide (ITO) thin films by sol–gel spin coating method

B. Murali Babu & S. Vadivel

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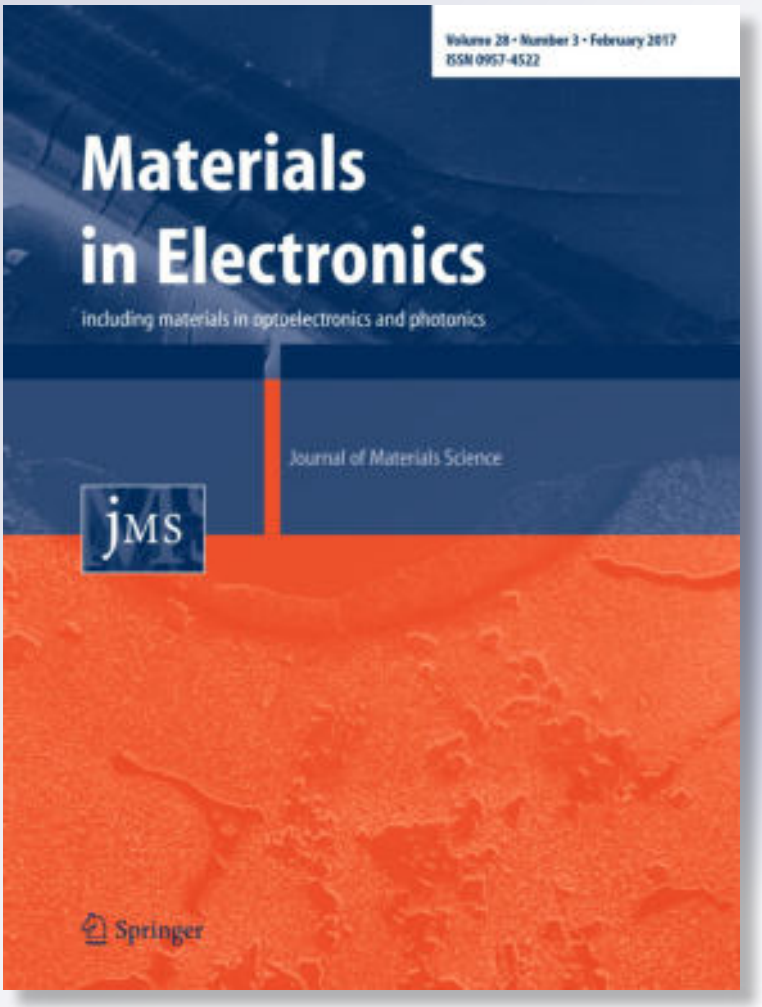

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3D Numerical Modeling of Quantum Dot Photo Detector using Haar Wavelet Transform

B. Murali Babu*; K. R. Kavitha**; P. Elakkiya***

*Department of Electrical and Electronics Engineering,

Paavai Engineering College,

Namakkal, Tamil Nadu, India.

**Department of Electronics and Communication Engineering,

Sona College of Technology,

Salem, Tamil Nadu, India.

***Department of Electrical and Electronics Engineering,

Paavai Engineering College,

Namakkal, Tamil Nadu, India.

Abstract

The 3D numerical modeling of nano scale InGaAs quantum dot is developed and the characteristics of the device are analyzed using Haar wavelet transform. The exact potential and energy profile of the quantum dot are computed by obtaining the solution of 3D Poisson and Schrodinger equations. The developed model is applied in photo detector application. The dark current, photo current, responsivity, detectivity and efficiency of the model are calculated by considering the structural parameters quantum dot density, applied voltage, length of quantum dot layer, number of quantum dot layer and temperature. The model is validated by comparing the results obtained with the existing models. The developed model is applied in photo detector. The photo current, responsivity, detectivity and efficiency of the model are calculated by considering the structural parameters like quantum dot density, applied voltage, length of quantum dot layer, number of quantum dot layer, light intensity and temperature. The model is validated by comparing the results obtained with the existing models.

Keywords: Quantum Dot, Schrodinger equation, Poisson equation, Dark current, Photo current, responsivity.

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Performance Characterization of Quantum Dot Solar Cell using Homotopy Decomposition Method

B. Murali Babu*; K. R. Kavitha**

*Department of Electrical and Electronics Engineering,

Paavai Engineering College,

Namakkal, Tamil Nadu, India.

**Department of Electronics and Communication Engineering,

Sona College of Technology,

Salem, Tamil Nadu, India.

Abstract

The 3D numerical model of InGaAs quantum dot solar cell is developed and presented in this paper. The device characteristics are examined based on the exact potential and energy profile of the quantum dot obtained from the solution of 3D Poisson and Schrodinger equations using Homotopy decomposition method. The QD current is estimated by considering the QD parameters and the results obtained show that the QD current is strongly influenced by quantum dot density and applied voltage. The characteristics of the quantum dot solar cell such as photocurrent, spectral response, recombination rate for the quantum wavelength and QD layers are obtained for various device parameters. The numerical simulation results exhibit the strength of the proposed model.

Keywords: Quantum Dot, Poisson equation, Schrodinger equation, Homotopy Decomposition Method, QD current, Photocurrent.

I. Introduction

Significant scientific discoveries are due to the unfold mysteries of natural phenomena and its close observation and linkages. The photovoltaic technology of power generation using semiconductors in the event of illumination of photons of sun's energy is an analogy of the natural phenomena, photosynthesis mechanism of plants. Solar cell structures using different photovoltaic semiconductor materials involve more process and geometrical design variables. Hence modeling

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Quadrilateral Scaled Threshold Weighted Averaging Filter for MRI Denoising

V. Royna Daisy*; S. Nirmala**

*Centre for Advanced Research,
Muthayammal Engineering College,
Rasipuram, India.

**Centre for Advanced Research,
Muthayammal Engineering College.
Rasipuram, India.

Abstract

Image denoising of Magnetic Resonance Imaging (MRI) by manifold approach focuses on the removal of inhomogeneous Gaussian and Rician noise without blurring the fine anatomical structures. Non Local Means (NLM) filter, the popular denoising technique, does not hold well for edge preservation of images with low Signal to Noise Ratio (SNR). Hence, an alternative formulation of NLM filter is required. This paper presents a quadrilateral scaling method based on image gradients for change in the isotropic nature of NLM and provides an estimate for edge orientation. A new definition of NLM weights based on similarity intensity measures that reflect on the noise statistics is introduced. The efficacy and feasibility of the proposed method is demonstrated through simulation. The probable reduction in time consumption is illustrated.

Keywords: Similarity measures; Quadrilateral scaling; Gradients; Threshold; Rician Noise.

1. Introduction

MRI, the most powerful diagnostic technique, is constantly subjected to additive Gaussian and Rician noise. Several filters in spatial and wavelet domain have been developed for effective noise removal. But, the NLM filters have outperformed many variational and wavelet-based filters in terms of noise removal. Brudes et al and J.V.Manjon et al explained the NLM algorithm, the successful denoising scheme which estimates each pixel value as a weighted average of other [1, 2]. P.Coupe et al showed that NLM's theoretical performance is more or less equivalent to wavelet

Fabrication and performance estimation of dye sensitized solar cell based on CdSe/ZnO nano particles

B. Murali Babu, M. Shyamala, S. Saravanan, K. R. Kavitha & S. Vadivel

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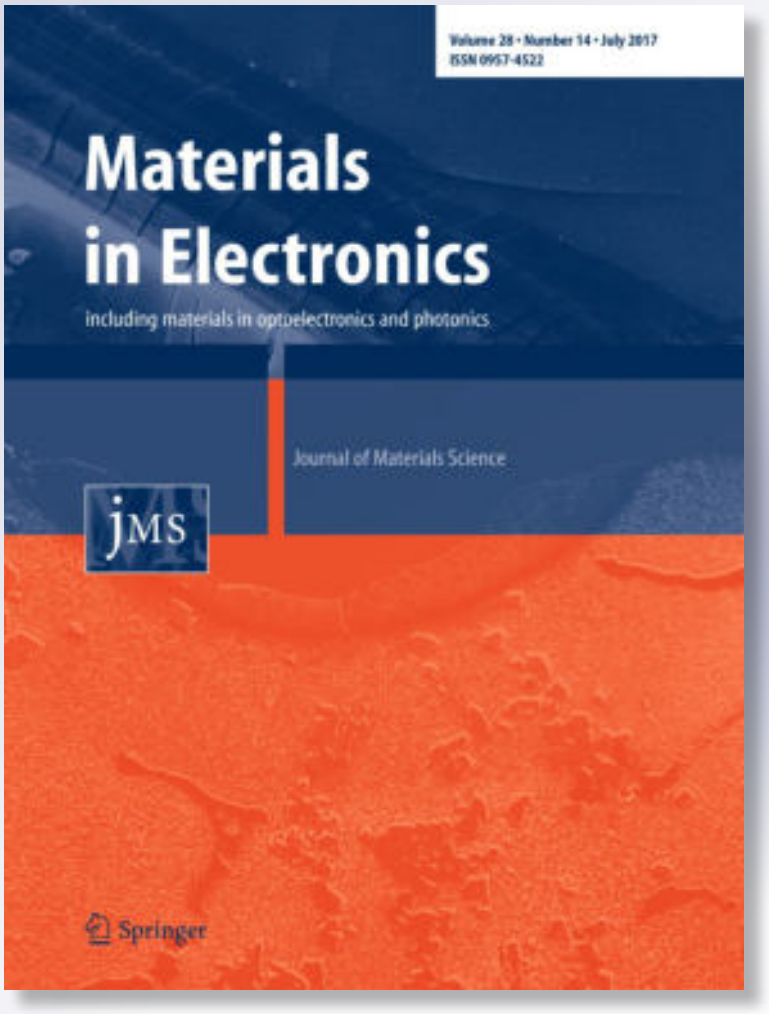

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3D Numerical Modeling of Quantum Dot Photo Detector using Haar Wavelet Transform

B. Murali Babu*; K. R. Kavitha**; P. Elakkiya***

*Department of Electrical and Electronics Engineering,

Paavai Engineering College,

Namakkal, Tamil Nadu, India.

**Department of Electronics and Communication Engineering,

Sona College of Technology,

Salem, Tamil Nadu, India.

***Department of Electrical and Electronics Engineering,

Paavai Engineering College,

Namakkal, Tamil Nadu, India.

Abstract

The 3D numerical modeling of nano scale InGaAs quantum dot is developed and the characteristics of the device are analyzed using Haar wavelet transform. The exact potential and energy profile of the quantum dot are computed by obtaining the solution of 3D Poisson and Schrodinger equations. The developed model is applied in photo detector application. The dark current, photo current, responsivity, detectivity and efficiency of the model are calculated by considering the structural parameters quantum dot density, applied voltage, length of quantum dot layer, number of quantum dot layer and temperature. The model is validated by comparing the results obtained with the existing models. The developed model is applied in photo detector. The photo current, responsivity, detectivity and efficiency of the model are calculated by considering the structural parameters like quantum dot density, applied voltage, length of quantum dot layer, number of quantum dot layer, light intensity and temperature. The model is validated by comparing the results obtained with the existing models.

Keywords: Quantum Dot, Schrodinger equation, Poisson equation, Dark current, Photo current, responsivity.

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Effect of annealing temperature on structural, optical and humidity sensing properties of indium tin oxide (ITO) thin films

M. Premkumar[1] · S. Vadivel[2]

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Abstract Tin doped indium oxide (ITO) thin films were prepared by sol–gel spin coating method with In $(NO_3)\cdot 3H_2O$ and $SnCl_4\cdot 5H_2O$ as indium and tin sources, respectively. The as deposited samples were annealed at various temperature such as, 300, 400, 500 and 600 °C for 2 h in ambient atmosphere. The grown ITO thin films are polycrystalline in nature with cubic structure of In_2O_3 with the space group La3 and the results are in good agreement with the standard JCPDS data (card no#06-0416). In addition crystalline size increases with increasing annealing temperature from 25 to 55 nm. Polycrystalline with uniform smooth surface was observed by SEM micrographs. The optical band gap energy was found to be decreased from 3.85 to 3.23 eV as the annealing temperature is increased from 300 to 600 °C. The humidity sensing performance (high sensitivity and fast response time) was significantly improved for 600 °C thin films samples, which is probably due to smaller energy band gap and physisorption between the water molecules and the surface of the thin films. The films were further characterized by PL and EDS analysis. The effect of temperature on humidity sensing mechanism of ITO thin films is also discussed.

✉ S. Vadivel
vadivel.physics@gmail.com

[1] Department of Mechanical Engineering, Paavai Engineering College (Autonomous), Namakkal, Tamil Nadu 637 018, India

[2] Department of Physics, Paavai Engineering College (Autonomous), Namakkal, Tamil Nadu 637 018, India

1 Introduction

Humidity sensors are widely used in measurement and to manage the humidity for human comfort and a myriad of industrial development. Recently, flexible sensors with suitable substrate has been attracted due to their light weight, robustness, low cost flexibility, making them suitable for application in various fields, such as handheld portable consumer electronics, smart textiles and radio frequency identification (RFID) tags and high performance humidity sensor devices [1–4]. Many metal oxide semiconductors like SnO_2, In_2O_3, ITO, ZnO, TiO_2, WO_3 are widely used for gas sensor and humidity sensing applications and have been in great demand in chemical, biomedical, military, pharmaceutical and food industries [5–7]. Moreover, they are very attractive material due to their suitable physico–chemical properties, high sensitivity, selectivity, high signal-to-noise ratio, low cost and small dimensions, which plays a vital role for the fabrication high performance sensor and microelectronic devices. In addition, they are the popular and useful sensing materials for making inexpensive humidity and gas sensing devices [8]. Indium-tin-oxide (ITO) films as transparent conducting oxides (TCOs), combining high electrical conductivity and high optical transparency in the visible spectrum, have been widely used as transparent conducting layers in various photoelectric components and devices such as liquid crystal displays (LCD), solar cells, sensors and organic light emitting diodes (OLED).

Vasanthi Pillay et al. [9] fabricated Indium tin oxide films at different sputtering power on to the glass substrate by fry magnetron sputtering technique. The results demonstrate that ITO thin film sensor showed a linear response to ethanol gas in the concentration range of 200–1400 ppm. Post-deposition annealing of the film at 700 K enhanced the response of the sensor. Thin films of indium tin oxide

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THERMAL ANALYSIS OF COPPER AND CHROMIUM ALLOY, COPPER AND ALUMINIUM SOLAR ABSORBER

Premkumar M[1], Ramachandran S[2]

[1]Research Scholar, Department of Mechanical Engineering, Sathyabama University, India
[2]Department of Mechanical Engineering, Sathyabama University, India

Abstract

In the solar chimney solar collector plates are used for heating up the ambient air. Increase in the temperature of the air inside the chimney increases the efficiency. Thus the solar absorber selected plays an important role in the efficiency of the solar chimney. In this paper the heat transfer analysis is done for solar absorbers like aluminium, copper and copper chromium alloy using ANSYS.The fluid dynamics analysis helps us to select the optimum sollr absorber. the analysis of various solar collector plates ,the nodal temperature of the copper chromium plate is compared with the copper and aluminium plates. The heat transfer and thermal conductivity of the copper chromium plate is compared with copper and aluminium plates

I. INTRODUCTION

The solar collecting material used in this solar chimney is copper and chromium alloy. Copper and Chromium is a heat treatable alloy offering good electrical conductivity, resistance to softening at elevated temperatures and good strength and hardness[1]. This combination of alloy absorbs more solar energy when compare with other materials. It is also preferred for resistance welding electrode materials for a variety of applications. Nominally composed of 99.1% copper and 0.9% chromium, this heat treatable alloy can be brought to its softest condition by annealing it at 1000$C (1850$F) for one-half hour at temperature, then rapidly quenching it in water[3]. In this annealed condition, the alloy is ductile and easily formed, and has an electrical conductivity of about 40% IACS and its chemical composition is Cu:98.80-99.40%, Cr:0.60 – 1.20 %.

TABLE 1
MECHANICAL PROPERTIES OF COPPER –CHROMIUM

Hardness	Rockwell B Scales	70
Tensile Strength	N/mm^2	482.633
Yield strength	N/mm^2	379.211
Elongation	cm	4.2

TABLE 2
PHYSICAL PROPERTIES OF COPPER –CHROMIUM

Thermal Conductivity	W/m.K	26.97
Specific Heat	J/Kg.K	376.8
Density	Kg/m^3	5.14
Modulus of Elasticity	N/mm^2	117210.90

II. THERMAL ANALYSIS FOR COPPER CHROMIUM PLATE

Thermal analysis is a general term used to describe analyses where the results quantities include stresses and strains. It is also known as thermal analysis.The properties of the copper plate is taken as follows: Thermal conductivity is 187 W/mk, Specific heat is 0.095 KJ/Kgk, Density is 0.321 kg/m^3 [6]. The Mesh Size that is the number of element divisions is 0.1".

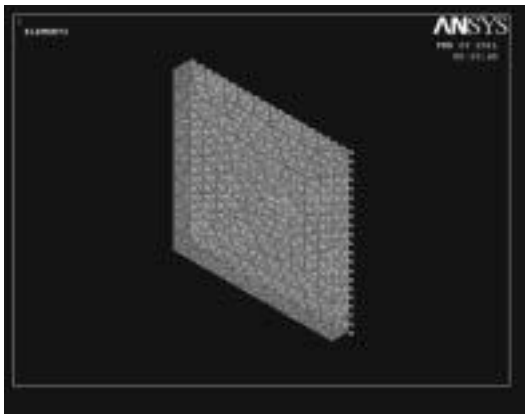

Fig.1. Solution of Temperature Model for Cu-Cr Plate

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Performance Assessment of Eco-Friendly Refrigerant Mixtures Alternative to HCFC 22 in a Small Capacity Window Air Conditioner

Elumalai P.*,***, Vijayan R.**
*Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India

**Department of Mechanical Engineering, Government College of Engineering, Salem, Tamilnadu, India

***Corresponding Author Email ID: eluammu@gmail.com (mailto:eluammu@gmail.com?cc=gbehal@indianjournals.com)

Abstract

This paper deals with the experimental work, which has been carried out in 1 ton of refrigeration window air conditioner working with ternary refrigerant mixture namely R152a/R290/R600 (by weight 80%/10%/10%). The properties of selected refrigerant mixtures were obtained from NIST REFPROP 7.0 for comparative analysis and refrigerant performance of proposed blends and of R22 for the given operating conditions. From the test results observation, The performance coefficient of M3 were found to be higher than that of R22 by 5.25% and the compressor power of M2, M3, M5, M1 were found to be lower by 5.22%, 5.22%, 1.74%, 0.87% respectively. Based on the experimentation and calculation, it is found that this new proposed mixture could be considered as potential replacement candidat for R22 in many applications and has shown better results as far as performance parameters are concerned and in turn theyare benig to the environment

Keywords

R22, Window Air conditioner, Global Warming, Ternary mixture, Environment Zero ODP.

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Tyre pyrolysis oil as an alternative fuel for diesel engines – A review

S.T. Kumaravel [a,*], A. Murugesan [b], A. Kumaravel [b]

[a] Department of Mechanical Engineering, Paavaai Group of Institutions, Paavai Institutions, Paavai Nagar, NH-7, Pachal 637018, Namakkal District, Tamilnadu 637018, India
[b] Department of Mechanical Engineering, K.S. Rangasamy College of Technology, Tamilnadu 637215, India

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ABSTRACT

Alternative fuels for diesel engines have become vital due to increase in energy expenditure, stringent norms of emission, depletion of fossil fuels and fluctuating cost of the petroleum products in india. To overcfome this problem, it is very important to find alternative fuels. The main focus of this review is to shed light on the importance of tyre pyrolysis oil as an alternative fuel for diesel engines. In this context, tyre pyrolysis oil has recently been receiving renewed interest. In this review, the pyrolysis mechanism, pyrolysis reactors, their product yield, characteristic analysis of tyre such as proximate analysis, elemental analysis and pyrolysis process are discussed. Pyrolysis of scrap tyre starts at 250 °C and gets completed at 550 °C. The presence of a catalyst produces lighter oil with drastic increase in the concentration of single ring aromatics. Engine performance, emissions and combustion parameters, such as the heat release rate and maximum rate of pressure rise, when engines are operated on a tyre pyrolysis oil were also discussed. NO(x), HC, CO, and smoke emissions were found to be higher at higher loads due to the high aromatic content and longer ignition delay. The ignition delays were longer than those with DF. It is concluded that it is possible to use tyre pyrolysis oil in diesel engines as an alternate fuel.

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Abbreviations: DTG, derivative thermogravimetry; TGA, thermogravimetric analysis; C, carbon; H, hydrogen; S, sulphur; O, oxygen; NOx, nitrogen oxide; DI, direct injection; TPO, tyre pyrolysis oil; DEE, diethyl ester; TF, tyre fuel; CO, carbon monoxide; HC, hydrocarbon; SO_2, sulphur dioxide; N_2, nitrogen; LFPO, light fraction pyrolysis oil; bTDC, before top dead centre; CA, crank angle; DTPO–DF, distilled tyre pyrolysis oil diesel blend; DF, diesel fuel

* Corresponding author. Tel.: +91 4286 243038, +91 4286 243058, +91 4286 243098, +91 9443451697 (mobile).
E-mail address: kumaravelthangavelu@gmail.com (S.T. Kumaravel).

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Embedded c controlled security door with hand-operated password

K.Yuvaraj[1], S.Vickram[1], M.Syed Abuthahir[1], P.Prem kumar[1], M.Maharajan[1], D.R.P.Rajarathinam[2], S.Mohankumar[3], M.Venugopal[3]

[1]B.E/Mechatronics Engineering College, Pachal, Namakkal
[2]Professor, Dept. of Mechatronics Engineering, Pachal, Namakkal
[3]Assistant Professor, Dept. of Mechanical Engineering, Paavai Engineering College, Pachal, Namakkal, Tamil Nadu, India

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Abstract-*Our project aims at far-flung password based door opener system through an android application. The system tends to make a protected door opening mechanism such that the door only unlocks when a security personnel opens it by entering the right password. The authorized personnel need to be present within Bluetooth range of the door but need not open the door manually. He just needs to introduce the right password through his android application in order to unlock the door. This is a useful concept in places where the surveillance needs to open gates quite usually or need to operate a door from a vehicle without needing to get down.*

Key Words**: **Android application, user friendly GUI, Bluetooth, Microcontroller, Password, etc.....

1.INTRODUCTION TO EMBEDDED SYSTEMS

What is Embedded system?
An Embedded System is a sequence of computer hardware and software, and perhaps additional mechanical or other parts, devised to perform a specific function. An embedded system is a microcontroller-based, software driven, decisive, real-time control system, autonomous, or human or network interactive, operating on diverse physical variables and in diverse environments and sold into a ambitious and cost conscious market.

1.1.SYSTEM DESIGN CALLS

An embedded system is not a computer scheme that is used primarily for processing, not a software system on PC or UNIX, not a conventional business or scientific application. High-end embedded & lower end embedded systems. High-end embedded system - mostly 32, 64 Bit Controllers used with OS. Examples Personal Digital Assistant and Mobile phones etc .Lower end embedded systems - mostly 8,16 Bit Controllers used with an minimal operating systems and hardware layout devised for the specific purpose. Examples Small controllers and devices in our everyday life like Washing tool, Microwave Ovens, where they are embedded in.

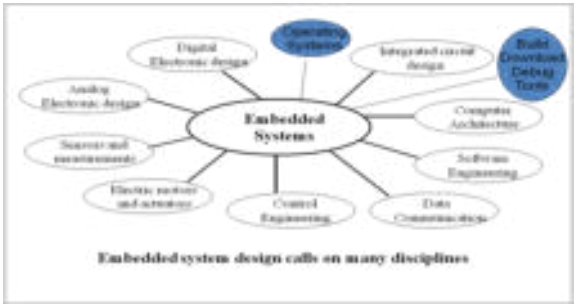
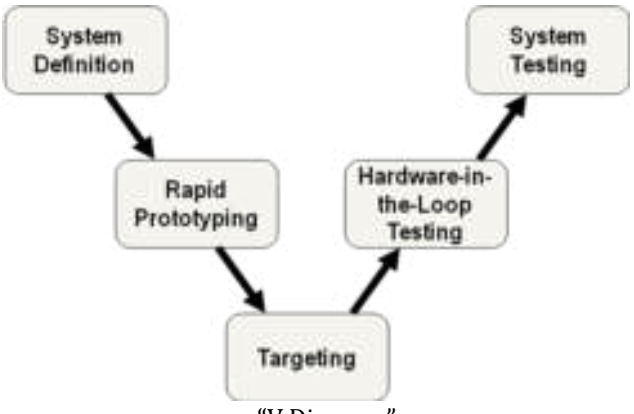


Fig-1: System Design cycle

1.2.EMBEDDED SYSTEM DESIGN CYCLE



"V Diagram"

Pecularity of Embedded Scheme

- An embedded system is any computer scheme hidden inside a product other than a computer.
- They will confront a number of difficulties when writing embedded system software in addition to those we encounter when we write applications.

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Enhancement of Wear Resistance of AISI 1040 Forged Steel Roller Shaft by different Ceramic Oxide Coatings using Plasma Spray Process for Sugarcane Industries

D. R. P. Rajarathnam*; M. Jayaraman**

*Department of Mechanical Engineering,

Paavai Engineering College,

Namakkal, Tamilnadu, India.

**Department of Mechanical Engineering,

Velalar College of Engineering and Technology,

Erode, India.

Abstract

In this investigation, ceramic oxide powders alumina, titania, chromia, alumina-titania, alumina-chromia and titania-chromia are coated on AISI 1040 forged steel substrate with a coating thickness of 200 μm by using the plasma spraying technique. Ni-Cr is used as an intermediate bond coat material to improve the coating adhesion for a thickness of 20 μm over the substrate. By using a pin-on-disc machine, dry wear test was carried out as per ASTM - G99 standards for a constant load of 10N, at different sliding distances of 1000m, 2000m, 3000m respectively. The result showed that the wear rate depends on various attributes such as microstructure, thickness of coating, porosity, surface roughness and hardness. Surface roughness measurements were performed on the specimens before and after wear tests by using talysurf instrument and the results showed that the highest value (20.42 μm) was obtained from the coating of alumina-titania. From the above investigation, the results obtained showed that a pure chromia coated specimen is having very good wear resistance property among the tested specimens. Hence it is suggested that pure chromia can be used for surface coating on top mill roll shaft used in sugar industries to enhance wear resistance.

Keywords: Forged steel, Plasma spraying technique, Pin-on-disc machine, Microstucture, Talysurf instrument, Roll shaft.

PERFORMANCE ANALYSIS OF BLDC MOTOR USING INTELLIGENT CONTROLLER

C MohanaPriya
EEE, Paavai Engineering College
Paavai Engineering College, ICETM215
Namakkal, India

N.Prasidha Devi
EEE, Paavai Engineering College
Paavai Engineering College, ICETM215
Namakkal, India

C Suruthy
EEE, Paavai Engineering College
Paavai Engineering College, ICETM215
Namakkal, India

D Murugesan
Assistant Professor,
EEE, Paavai Engineering College
Paavai Engineering College, ICETM215
Namakkal, India

ABSTRACT

Nowadays BLDC machines electrically satisfying as a core conformation Electrical engineering .This paper deliver the analysis of dissimilar parameters which are direct to run the Brushless Direct Current (BLDC) motor at surpass speed. Various BLDC motor parameters have been analyzed in modern years due to growing demand precede to further innovations. The active characteristics of BLDC motor (speed and torque) and as well as current and voltages are gently observed and analyzed by using intelligent controller and MATLAB/SIMULINK. A simple algorithm is used to calculate motor speed incidentally by the software. Finally analysis has been designed on the basis of characteristics of stator currents, rotor speed and electromagnetic torque. The modeling of intelligent controller and simulation of BLDC motor is done using MATLAB/SIMULINK. From these results, it yield the predictability of a new system that increase the convenience to the require. The study Pointouts the paucity that has to be better. The preamble of a sophisticated coordination can overcome this and will be talented to afford a finest recital to our electrical engineering.

KEY WORDS: BLDC motor, Arduino DIP, H-Bridge inverter, opto isolator.

I INTRODUCTION

Predictable DC motors have many properties such as high efficiency and narrow torque-speed characteristics. The control of DC motor is also harmless and does not need much composite hardware. However, the chief drawback of the dc motor is the necessity of fixed maintenance. The Brushes of the mechanical commutator eventually wear out and need to be refund. The mechanical commutator has other undesirable effects such as sparks, acoustic noise and carbon particles coming from the brushes. With sharp developments in power electronics, power semiconductor technologies, modern control theory for motors and manufacturing technology for high performance magnetic materials, the Brushless DC (BLDC) motors have been widely used in many applications. BLDC Motor have many benefit over conventional DC motors like: Long operating life, High dynamic response, High efficiency, Better Speed vs. Torque characteristic, Noiseless operation ,Higher speed range and Higher Torque-Weight ratio. Due to high power to weight rate, high torque, excellent dynamic control for changeable speed applications, withdrawal of brushes and commutator make Brushless DC (BLDC) motor [1], best option for high performance applications.

Due to the withdrawal of brushes and commutator there is no Problem of mechanical wear of the shifting parts [2], [3]. As well, better heat dissipation property and capacity to work at high speeds [4-5] make them top-sawyer to the conventional dc machine. However, the BLDC motor constitutes a more difficult problem than its brushed counterpart in terms of modelling and control system design due to its several-input nature and conjugated nonlinear dynamics. Due to the simplicity in their control, Permanent-magnet brushless dc motors are more accepted and necessity in high-performance applications. A BLDC Motor is a permanent magnet synchronous motor that uses position detectors and an inverter to control the armature currents. Its armature is in the stator and the magnets are on the rotor and its operating characteristic favor those of a DC motor [1]. Instead of worn a mechanical commutator as in the conventional DC Motor [2-3], the BLDC motor engage electronic commutation which makes it a virtually maintenance free. The BLDC motor is driven by DC voltage but current

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Delay Tolerant Spatial Distribution of Content Replication in Wireless Networks for Efficient Video Streaming

[1]R. Jayavadivel and [2]J. Sundararajan

[1]Department of Information Technology,
Paavai Engineering College, Pachal, Namakkal, Tamilnadu, India
[2]Principal, Pavai College of Technology, Pachal, Namakkal, Tamilnadu, India

Abstract: The growth of information technology has introduced various functionalities and services to support video streaming like video streaming and live streaming. There are many approaches has been discussed to support content delivery in wireless networks, but suffers with the problem of latency and quality of streaming which takes more time and the frequency of retransmission is high. To solve these problems, we propose a delay tolerant approach with spatial distribution of video contents to support efficient video streaming. The proposed method maintains numbere of replicas of video content in different locations of wireless networks. The method selects the location of the video content or the node which has the requested data according to the delay present in the network and the user location. Also the number of replicas maintained is performed according to the spatial request factor which represents the number of request being received from different user from a specific spatial region and the delay present in the network towards a video content. The proposed method reduces the overall latency present in the network and increases the efficiency of content delivery which supports multimedia data transfer. Also the proposed method reduces the overall time complexity and reduces the overhead introduced by data transfer.

Key words: Replication · Spatial Distribution · Video Streaming · Wireless Networks

INTRODUCTION

Wireless networks is the collection of wireless nodes where the nodes of wireless network can be classified according to the service provided or the data it posses. Some of them has data nodes which stores various information which can be accessed by the other nodes of the network. Some of them provides set of wireless services which can be accessed by the other nodes of the network. The wireless network has no fixed topology and can be of any form. The application of wireless networks has no limit and can be applied for video streaming.

Video streaming is the process of transferring video content to the client who requested the video. The video is nothing but a collection of scenes where each scene has number of frames or snapshots. Each frame has fixed size according to the quality of the video and each video sccene has number of frames according to the video quality. Because of the wireless nodes and their mobility of nodes, accessing video files from geographically longer distance introduce more traffic in the network and increases latency in the network which reduces the quality of service of the network.

To avoid streaming data from longer routes, there are options where the data files are stored in distributed manner. The files are stored geographically distributed which helps uses to fetch the requested files from the nearby nodes. What happens when distributing the data files in more nodes where there is no necessary, it reduces the resource utilization of the wireless nodes, because the wireless nodes are limited with the storage and cannot store more amount of data. In order to increase the resource utilization, the data files has to be stored in optimal manner and the selection of the nodes has to performed in efficient manner.

Replica are the copy of data file which is placed in various locations of the network according to various requirements and other factors. Generally the replicas are

Corresponding Author: J. Sundararajan, Principal, Pavai College of Technology, Pachal, Namakkal, Tamilnadu, India.

Audit Free Cloud Storage via Deniable attribute based Encryption

[1]B.Venkatesan, [2]S.Saravanakumar, [3]V.Saravanabhavan

[1]*Assistant Professor, Department of Information Technology* ,[2]*Assistant Professor, Department of Information Technology,* [3]

Paavai Engineering College, Namakkal, Tamil Nadu, India.

Abstract

Cloud storage services have grow popularly. For the importance reason of privacy, many cloud storage encryption schemas has been proposed to secure the data from those who do not have access. All such schemes assumes that cloud storage providers are secure and cannot be hacked. However in practice, some authorities may compel cloud storage providers to make public user secrets and confidential data. We consider the problem of building a secure cloud storage service on top of a public cloud infrastructure where the service provider is not completely trusted by the customer. In this paper a new cloud storage encryption schema is proposed which allows cloud storage providers to protect user privacy. Since authorities cannot tell the obtained secrets are true or false, the cloud storage providers ensure that the user privacy is still securely provided. The proposed schemes believe cloud storage service providers or trusted third parties handling key management are trusted and cannot be hacked. Some times may intercept the communication between users and cloud storage providers and then compel storage providers to release user secrets by using government power or other means. In this case the encrypted data are assumed to be known and storage providers are requested to release user secrets. The proposed Deniable CP-ABE scheme is to build an Audit free cloud storage service. The deniability feature makes coercion invalid, and the ABE property ensures secure cloud data sharing with a fine grained access controlledmechanism.

Keywords- cloud storage, service providers, key management, attributes based Encryption, Deniable Encryption process.

1. INTRODUCTION

Cloud storage is a form of data storage where the digital data is stored in logical pools, the physical storage span multiple servers (and often locations), and the physical environment is typically owned and handled by a hosting organization. These cloud storage providers are answerable for keeping the data available and accessible, and the physical environment protected and running. Different organizations buy or lease storage capacity from the providers to store customer application data. Cloud storage services may be accessed through a co-located cloud computer service, a web service application programming interface (API)[4] or by applications that utilize the API, such as cloud desktop storage, a gateway or Web- based content management systems. In the cloud storage environment customers can store their data on the cloud and access their data from anywhere at any time by connecting to a network. Because of user privacy, the data stored on the cloud is normally encrypted and safe guarded from access by other users. Considering the collaborative property of the cloud data, attribute-based encryption (ABE) is regarded as one of the most suitable encryption schemes for cloud storage. Attribute-based encryption is a kind of public-key encryptionin which the secret keyof a user and the cipher text are reliant upon attributes. In such a structure, the

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OSCILLATION THEOREMS FOR FRACTIONAL ORDER NEUTRAL DIFFERENTIAL EQUATIONS

V. GANESAN[1] AND M. SATHISH KUMAR[2]
[1] Department of Mathematics,
Aringar Anna Government Arts College, Namakkal - 637002, Tamilnadu, India.
[2] Department of Mathematics,
Paavai Engineering College, Namakkal - 637018, Tamilnadu, India.

Abstract

The purpose of this paper is to study the oscillation of the fractional order neutral differential equation

$$D_t^{\alpha}[r(t)[D_t^{\beta}(x(t)+p(t)x(\tau(t)))]^{\gamma}]+q(t)x^{\gamma}(\sigma(t))=0,$$

where D_t^{α} ($0<\alpha<1$) is a modified Riemann-Liouville derivative. The obtained results are based on the new comparison theorems, which enable us to reduce the oscillatory problem of 2nd order fractional differential equation to the oscillation of the first order equations. The results are easy to verify.

1. Introduction

In this article, we are concerned with the oscillation of solutions to the nonlinear fractional order neutral differential equation with the form

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Key Words : *Oscillation, Comparison theorem, Fractional differential equation, Modified Riemann-Liouville derivative.*

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Fabrication of double cation (Sn + Mg) activated ZnO thin films for environmental and health care applications

R. Mohan[1] · S. Snega[2] · K. Ravichandran[2] · S. Vadivel[3]

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Abstract Undoped and Sn + Mg doped ZnO thin films were deposited onto glass substrates using a nebulizer spray technique. The optical, structural, photoluminescence, morphological, photocatalytic and antibacterial properties were investigated for various doping levels (2, 4, 6, 8 and 10 at.%) of Mg and constant doping level (6 at.%) of Sn. The XRD studies show that all the films are polycrystalline ZnO with hexagonal wurtzite structure and the size of the crystallites is in the range of 48–71 nm. The optical transmittance in the visible region increases desirably (≈90%) after doping. Significant enhancement in the optical band gap is observed with Mg doping. ZnO:Sn:Mg thin film sample with 6 at.% of Mg doping level exhibits good photocatalytic and antibacterial efficiencies. The reduction in grain size due to doping as observed from SEM images plays an important role in enhancing the photocatalytic and antibacterial efficiencies of ZnO:Sn:Mg films. The structural, optical and photoluminescence results corroborate well with the discussions on the photocatalytic and antibacterial efficiencies of the ZnO:Sn:Mg films.

✉ S. Snega
snegaphy@gmail.com

[1] Department of Physics, Sree Sevugan Annamalai College, Devakottai, Tamil Nadu, India

[2] AVVM Sri Pushpam College (Autonomous), Poondi, Thanjavur, Tamil Nadu 613 503, India

[3] Department of Physics, Paavai Engineering College, Namakkal, Tamil Nadu, India

1 Introduction

In the recent decade, the development of cost-effective and highly efficient semiconductor photocatalysis is very much essential for the degradation of organic pollutants and toxics [1]. Therefore, an increasing attention has been paid to environmental semiconductor photoctalysis for air and water purification, water disinfection, hazardous waste remediation, antibacterial deodorization and self cleaning [2]. Among the various semiconductor oxide photocatalysts, ZnO looks very promising material due to its special features like good chemical and thermal stability, high transparency, UV blocking capability, superior durability and bio-compatibility [3].

ZnO is a direct, wide band gap semiconductor (3.37 eV) with a large exciton binding energy (60 meV), n-type conductivity, abundant in nature, low-cost, environmental friendly features [4]. These characteristics makes this material attractive for many applications such as solar cells, optical coatings, spintronic devices, biological sensors, photocatalysts and antibacterial agents in biomedical applications [5–8]. Moreover, ZnO exhibits strong antibacterial activities against a broad spectrum of bacteria. It has bactericidal properties primarily due to its photocatalytic activity [9]. The absorption of UV or visible light by ZnO induces separation of charges thereby generating electron–hole pairs which in turn participate in the antibacterial activity.

Doping is one of the effective methods to obtain ZnO derived materials with tunable properties for enhancing the impact on environment and health care applications. The doping materials incorporated into the ZnO lattice can increase the efficiency of photocatalytic degradation which depends on many parameters such as creation of defects, slow down the recombination of electron–hole

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High performance humidity sensing properties of indium tin oxide (ITO) thin films by sol–gel spin coating method

B. Murali Babu[1] · **S. Vadivel**[2]

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Abstract The tin doped indium oxide (ITO) thin films prepared by sol–gel spin coating method with $In(NO_3)3$ H_2O and $SnCl_4{\cdot}5H_2O$ as indium and tin sources respectively is presented. The as deposited samples were annealed at 500 °C for 2 h in order to improve the crystallinity. The structural, morphological and optical properties of the films were analysed by using X-ray diffraction, scanning electron microscope (SEM), UV–Vis transmission spectra and photoluminescence, spectra analysis. The SEM images ensure the uniform and smooth surface of the as prepared and annealed film. The optical transmittance of more than 85 % has been observed in the UV–Vis region with a band gap of 3.91 and 3.73 eV for the as prepared and annealed films of ITO respectively. The PL spectra reveal that the optical properties were significantly improved due to the annealing effect. The annealed film shows high sensitivity for humidity approximately two order changes in the resistance and the sensitivity increases for different relative humidity from 10 to 90 % due to the physisorption between the water molecules and the surface of the thin films.

✉ S. Vadivel
vadivel.physics@gmail.com

[1] Department of Electrical and Electronics Engineering, Paavai Engineering College, Namakkal, Tamilnadu 637018, India

[2] Department of Physics, Paavai Engineering College, Namakkal, Tamilnadu 637018, India

1 Introduction

Thin film semiconductors play an essential role in detection, monitoring and control of the pollutants involved in the chemical processes the production of hazardous and harmful vapours [1]. Metal-oxide-based thin film sensors, in spite of their commercial success and decades of research and development, still lack selectivity for different species, and often require high working temperatures. This severely limits their usability and poses long-term reliability problems [2]. The sensitivity of the metal oxide based sensors is dependent on the preparation parameters of the sensitive layer/material [3]. Generally, humidity sensor of these films having nanometer size grain with porous structure, which is most important parameters of their potential application for micro sensors. Moreover this type of nanostructure films are optimal candidates for humidity sensing properties due to the high surface exposed for absorption of water molecules. Indium tin oxide, commonly referred to as tin doped indium oxide (ITO), is degenerate n-type semiconducting material that has wide applications in optics and optoelectronics. These applications include flat panel display devices [4, 5], heat reflecting mirrors [6], and heterojunction solar cells [7]. Indium tin oxide (In_2O_3:10 %SnO_2) films have been extensively studied in recent years because they exhibit relatively rare combination of high visible transmission and significant electrical conductivity, high substrate adherence, good hardness, and chemical inertness.

ITO thin films deposited on glass substrates by a variety of techniques such as rf sputtering [7, 8] electron beam deposition [9], chemical vapor deposition [10], and spray pyrolysis [11]. Among these, sol–gel dip coating method offers the most possibilities to influence the film properties by modifying the size and structure of the inorganic species

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Effect of annealing temperature on structural, optical and humidity sensing properties of indium tin oxide (ITO) thin films

M. Premkumar[1] · S. Vadivel[2]

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Abstract Tin doped indium oxide (ITO) thin films were prepared by sol–gel spin coating method with In $(NO_3)\cdot 3H_2O$ and $SnCl_4\cdot 5H_2O$ as indium and tin sources, respectively. The as deposited samples were annealed at various temperature such as, 300, 400, 500 and 600 °C for 2 h in ambient atmosphere. The grown ITO thin films are polycrystalline in nature with cubic structure of In_2O_3 with the space group La3 and the results are in good agreement with the standard JCPDS data (card no#06-0416). In addition crystalline size increases with increasing annealing temperature from 25 to 55 nm. Polycrystalline with uniform smooth surface was observed by SEM micrographs. The optical band gap energy was found to be decreased from 3.85 to 3.23 eV as the annealing temperature is increased from 300 to 600 °C. The humidity sensing performance (high sensitivity and fast response time) was significantly improved for 600 °C thin films samples, which is probably due to smaller energy band gap and physisorption between the water molecules and the surface of the thin films. The films were further characterized by PL and EDS analysis. The effect of temperature on humidity sensing mechanism of ITO thin films is also discussed.

✉ S. Vadivel
vadivel.physics@gmail.com

[1] Department of Mechanical Engineering, Paavai Engineering College (Autonomous), Namakkal, Tamil Nadu 637 018, India

[2] Department of Physics, Paavai Engineering College (Autonomous), Namakkal, Tamil Nadu 637 018, India

1 Introduction

Humidity sensors are widely used in measurement and to manage the humidity for human comfort and a myriad of industrial development. Recently, flexible sensors with suitable substrate has been attracted due to their light weight, robustness, low cost flexibility, making them suitable for application in various fields, such as handheld portable consumer electronics, smart textiles and radio frequency identification (RFID) tags and high performance humidity sensor devices [1–4]. Many metal oxide semiconductors like SnO_2, In_2O_3, ITO, ZnO, TiO_2, WO_3 are widely used for gas sensor and humidity sensing applications and have been in great demand in chemical, biomedical, military, pharmaceutical and food industries [5–7]. Moreover, they are very attractive material due to their suitable physico–chemical properties, high sensitivity, selectivity, high signal-to-noise ratio, low cost and small dimensions, which plays a vital role for the fabrication high performance sensor and microelectronic devices. In addition, they are the popular and useful sensing materials for making inexpensive humidity and gas sensing devices [8]. Indium-tin-oxide (ITO) films as transparent conducting oxides (TCOs), combining high electrical conductivity and high optical transparency in the visible spectrum, have been widely used as transparent conducting layers in various photoelectric components and devices such as liquid crystal displays (LCD), solar cells, sensors and organic light emitting diodes (OLED).

Vasanthi Pillay et al. [9] fabricated Indium tin oxide films at different sputtering power on to the glass substrate by fry magnetron sputtering technique. The results demonstrate that ITO thin film sensor showed a linear response to ethanol gas in the concentration range of 200–1400 ppm. Post-deposition annealing of the film at 700 K enhanced the response of the sensor. Thin films of indium tin oxide

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Fabrication and performance estimation of dye sensitized solar cell based on CdSe/ZnO nano particles

B. Murali Babu[1] · M. Shyamala[1] · S. Saravanan[2] · K. R. Kavitha[2] · S. Vadivel[3]

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Abstract In this paper, the core cell CdSe/ZnO nanoparticles were synthesized by novel aqueous solution route. The as prepared samples were annealed at 450 °C for 30 min in ambient atmosphere to improve the structural perfection. A considerable blue shift and increase in the band gap was observed with the increase of Se content and quantum confinement effect. The TEM image reveals that the obtained CdSe/ZnO core shell nanomaterials are ranging from 20 to 50 nm in diameter. The prepared core shell nanomaterials are coated on the surface of mesoporous TiO_2 layer deposited on FTO substrate using Dr. Blade method. The platinum electrodes are used as counter electrodes and iodine I_3 as electrolyte and N3 as Dye. The photovoltaic characteristics, electrochemical impendence spectra for the DSSCs are investigated in terms of open circuit voltage, short circuit current, fill factors, solar cells efficiency and electron life time.

1 Introduction

The depletion of petroleum resources of the century and increasing awareness on environmental changes and its challenges made the nation and public to explore the renewable energy sources, mainly solar energy. The silicon-based solar technologies though, energy efficient, its high production costs have made to develop much cheaper photovoltaic devices with reasonable efficiency. In this perspective, dye sensitized solar cells (DSSCs) have emerged as an important alternative to conventional silicon solar cells owing to their fascinating features such as low fabrication cost and relatively high efficiency [1].

The DSSC is based on the sensitization of extensive band gap semiconductors and consists of minority semiconductor materials. The semiconductor materials are sandwiched between photo-sensitized anode and electrolyte, thus creating a photo electrochemical effect [2]. DSSC mostly consists of four mechanisms: (i) a wide band gap (TiO_2 or ZnO) semiconductor thin film electrode (photoanode); (ii) a sensitizer (dye) adsorbed on top of the surface of the semiconductor thin film; (iii) electrolyte containing a redox couple, iodide/triiodide (I/I_3); and (iv) a counter electrode (CE) with a thin layer of catalytic materials such as platinum (Pt) [3].

Generally, the photoelectrode of a DSSC is equipped by doctor-blading or screen-printing. The dye molecule is energized from ground state via absorption of light photon and transfers the electron into the conduction band and leaves the dye in an oxidized state. The oxidized dye is condensed to the ground state by taking the donor electrons present in iodide/iodine electrolyte and does not allow further light photons. After reaching the FTO/ITO electrode, the electrons leave behind through an external circuit and arrive at the counter electrode, where they are accepted by electrolyte, catalyzed by platinum and recombine with triiodide and iodide again. Thus sunlight is converted to electrical energy [4]. II–VI compound semiconductor nanocrystals have unique optical properties that can be tuned not only by changing the particle size but also by changing the composition of the alloy.

✉ S. Vadivel
vadivel.physics@gmail.com

[1] Department of Electrical and Electronics Engineering, Paavai Engineering College, Namakkal, Tamil Nadu 637 018, India

[2] Centre for Photonics and Nanotechnology, Sona College of Technology, Salem, Tamil Nadu 636 005, India

[3] Department of Physics, Paavai Engineering College, Namakkal, Tamil Nadu 637 018, India

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Brush Plated Copper Gallium Sulphide Films and their Properties

B. Kajamaideen[1], A. Panneerselvam[2] and K. R. Murali [3,]*

[1] Department of Science and humanities (Physics), KIT-Kalaignarkarunanidhi Institute of Technology, Coimbatore 641 402, India.
[2] Department of Physics, Paavai Engineering College, Paachal, India
[3] ECMS Division, CSIR-CECRI, Karaikudi -630 006, India.

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Abstract: Copper gallium sulphide films were deposited for the first time by the brush plating technique at different electrolyte temperatures in the range of 30°C - 80°C and at a constant deposition current density of 5.0 mA cm-2. X-ray diffractograms of the films are single phase with chalcopyrite structure. EDAX measurements indicated that the Cu/Ga ratio decreased from 1.29 to 1.00 as the electrolyte temperature increased from 30°C - 80°C. The grain size increased with increase of electrolyte temperature. The grain size increases from 100 nm to 300 nm as the electrolyte temperature increases.

Keywords: brush elctrodeposition technique, thin film, semiconductor, electronic material, chalcopyrite

1 Introduction

Polycrystalline $CuGaS_2$, a ternary compound that has relatively low toxicity, has a direct optical band gap of about 2.4 eV - 2.5 eV. For this reason, the $CuGaS_2$ has been expected to be adopted as a Cd-free window layer for $Cu(In_{1-x}Ga_x)Se_2$-type solar cell or a green light-emitting material (Birkmire 2001, Jager-Waldau 2004) $CuGaS_2$ thin films can be prepared through various methods such as Modulated Flux Deposition (MFD) (Guillen & Herrero 2006), Metal-Organic Vapour-Phase Epitaxy (MOVPE) (Branch et al 2005), Electron Beam Evaporation (Jeong & Park 2003) and Metal-Organic Chemical Vapour Deposition (MOCVD) (Chichibu et al 1995). In this work, the brush electrodeposition technique has been employed for the first time to deposit $CuGaS_2$ films.

In this work, the brush electrode position technique was employed, to deposit $CuInS_2$ films for the first time. Brush plating technique is an electroplating process performed with hand held portable tool rather than a tank of solution is known as brush plating. The brush plating processes are also called as contact plating, selective plating or swab platting. This is essentially a plating method, deposition of a metal on the surface by electrochemical means, where the work is connected cathodically to the current source. The plating is then applied by means of a brush or swab, soaked with solution and connected to a flexible anode cable. A direct current power pack drives the electrochemical reaction, depositing the desired metal on the surface of the substrate.

In practice, movement between the anode and cathode is required for optimum results when plating, stripping, activating and so on. Currently a broad range of metals can be plated by brush plating. The key advantage of selective plating is portability. Many systems can be moved to various locations in a production facility or be transported to the job site. Selective plating is also versatile since it permits most electroplate types to be deposited onto any conductive substrate that can be touched with an electrode. Selective plating allows higher current densities than tank plating, which translates into higher deposition rates, up to 0.01 mm min^{-1}. In addition, inherently precise thickness control permits plate buildup or repair without the need for subsequent machining. Controlling continuous movement between the anode and the work piece or cathode, is a key element in obtaining high quality brush plated deposits. However, quality also depends on plating within a specific current density range. The visual appearance of electroplate is also an indicator of quality. A dark grey or black deposit usually corresponds to a burnt deposit, which results from too high current densities or insufficient movement. In contrast, inadequate current density or too much movement produces a generally shiny surface. The films were

*Corresponding author E-mail: muraliramkrish@gmail.com

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Characteristics of brush electrodeposited $CuGaTe_2$ thin films

A. Panneerselvam[a], P. Muthusamy[b], and K. R. Murali[c]

[a]Department of Physics, Paavai Engineering College, Pachal, Namakal, India; [b]Research Scholar, Anna University, Chennai, India; [c]Department of Theoretical Physics, University of Madras, Chennai, India

ABSTRACT

In this work, the brush electro deposition technique was employed for the first time to deposit $CuGaTe_2$ (CGT) films at different substrate temperature with a deposition time was 20 min. X-ray diffraction diagram of CGT films formed at different substrate temperature were polycrystalline chalcopyrite structure. Composition of the films was determined by the EDAX attachment of the SEM. From the Atomic force microscopy images, shows that the band gap was found to slightly increase with decrease of substrate temperature, due to the small grain size. Photo electrochemical cell studies indicated the conversion efficiency of 10.82% after photoetching.

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KEYWORDS
Copper gallium telluride; electrodeposition

1. Introduction

$CuGaTe_2$ (CGT) is a potential candidate for solar energy application owing to its high absorption co-efficient, near infrared band gap, high non linear susceptibility [1, 2]. This material exhibits large tolerance to stoichiometry variations compared to other ternary and binary compounds [3]. CGT thin films have been grown using different techniques such as thermal evaporation [4], flash evaporation [5], annealing of stacked elemental layers [6], co-evaporation of elements [7], pulsed laser deposition [8], electro-deposition [9], pulse plating [10] and brush plating [11]. Amongst them the brush plating technique is a very versatile technique for the deposition of thin and thick films. It is a portable technique.

Brush plating, also known as selective plating, or swab plating, is a very useful and portable method of contact plating. In its simplest form, the brush plating process resembles painting. Brush plating equipment includes power packs, solutions, plating tools, anode covers, and auxiliary equipment. The power pack has two leads. One is connected to the plating tool and the other is connected to the work piece to be plated. The anode is covered with an absorbent material which holds the solution. The operator dips the plating tool in the solution and then brushes it against the surface of the work piece that is to be finished. When the anode touches the work surface a circuit is formed and an electro deposit is produced. Plating occurs

CONTACT A. Panneerselvam panneer.phy@gmail.com
Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/ginf.
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3. A Novel Tool for Clustering Internal Quality Assurance Cell (IQAC) Documents from Departments Using Saarc Algorithm

[1]*V. Annapoorani,* [2] *Dr. A. Vijaya,*
[1]*Associate Professor in MCA Department, Paavai Engineering College, Pachal, Namakkal*
[2]*Associate Professor in MCA Department, Govt Arts College Salem-636007*

Abstract: ***This paper delivers a novel tool to create Information for Internal Quality Assurance Cell (IQAC) Of National Assessment and Accreditation Council (NAAC). Internal Quality Assurance Cell (IQAC) documents include Institutional Information for Quality Assessment (IIQA), Self Study Report (SSR), Student Satisfaction Survey (SSS), Annual Quality Assurance Report (AQAR) and Quality Indicator Framework (QIF) etc collected from various departments. This method is creating a spontaneous sorting clock that sorts and retrieves NAAC documents based upon their criteria to issue the approval for Universities, Autonomous Colleges and Affiliated Colleges. All educational institutions want to improve their standard, they have been used this tool and getting the NAAC approval in easy way. This clock is to make available whole collection list of IQAC documents from departments using SSARC algorithm. Here, this tool address seven criteria and thirty-four Key indicators to get NAAC approval for improving their quantity and quality of higher education. Following the names of seven criteria for assessment are Curricular Aspects, Teaching - Learning and Extensions, Research, Innovations and Extensions, Infrastructure and Learning Resources. Student Support and Progression, Governance, Leadership and Management, Institutional Values and Best Practices. All educational Institutions followed these criteria and get NAAC approval.***

Keywords: SSARC, SLIA, TFIDF, IIQA, LSI, NLP, ICT, HTML, HEI, MHRD, UGC, PCA, SSR, DVV

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1. INTRODUCTION

In this paper, address the name of IQAC documents in orderly fashion, so as to retrieve rapid comprehension of the retrieved document. The documents of IQAC are grouped into different disjoint cluster using novel clustering algorithms based on tree partitioning that produce an important progress in outcomes over traditional clustering algorithms used in information retrieval. In SSARC algorithm uses a hierarchical Divisive Cluster used for collecting the IQAC documents and principal Component Analysis method used for sorting these documents. This method fixes the threshold value and that value used to sorting the IQAC documents. After sorting, these clusters are categorized in criteria order using semantic - lexicon induction method is used to stored in a clockwise manner. SSARC algorithm used for collecting IQAC documents from various departments and helps in making the sorting process simpler for the retrieving process to the end-user.

1.1 REVISED ACCREDITATION FRAMEWORK (RAF)

RAF was developed by Ministry of Human Resource Development (MHRD) and University Grant Commission meetings based on the outcome of the National Workshop and inputs. Core Working Group (CWG) and Sectoral Working Group (SWG) were setup to discuss and deliberate on the RAF. The revised framework developed in partnership with stakeholders have a distinct focus on data capture for quantitative assessment and process

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Tiger Hash Attribute Encryption for Secured Cloud Service Provisioning

[1]P. Muthusamy and [2]V. Murali Bhaskaran

[1]Department of Computer Science & Engg,
Anna University, Chennai - 600 025, Tamil Nadu, India
[2]Principal, Dhirajlal Gandhi College of Technology, Salem - 636 309, Tamil Nadu, India

Abstract: Cloud Computing facilitates organization to share various operation services in a high secure manner. In cloud based communication, the confidentiality of the systemis the major concern. Hence, the secured message communication is to prevent unauthorized access of confidential information. Several encryption approacheshave been developed for cloud service provisioning. But, cloud users still have major security and confidentiality about their outsourced data due to unauthorized access within the service providers. In order to improve the confidentiality in cloud service provisioning, Tiger Cryptographic Hash Function based Attribute Encryption and Decryption (TCHF-AED) technique is introduced. Tiger is a cryptographic hash function for achieving higher confidentiality rate in cloud service provisioning. Initially, the attribute cloud request is sent from the users to cloud server. Next, Tiger Cryptographic Hash Function is used to achieve cloud data confidentiality based on output of hash value.TheAttribute Encryption is performed for converting actual message into cipher textand the hash value of each encrypted message is calculated. The encrypted message with hash value is stored in cloud server. Whenever the cloud user accesses the data from cloud server, the hash value is recomputed to achieve the correctness of the message. If the correctness is achieved the decryption is performed to attain the confidentiality. The Attribute Decryption is carried out to decrypt the cipher text and achievean original message. This helps to improve the confidentiality rate and reduces the communication overhead. Experimental results shows that the proposed TCHF-AED technique achieves better performance in terms of Communication overhead, encryption time, memory consumption and confidentiality rate compared to the state-of-the-art works.

Key words: Cloud service provisioning • Cloud users • Tiger Cryptographic Hash Function • Attribute Encryption • Attribute Decryption • Cipher text

INTRODUCTION

Cloud computing is a one of the Internet-based computing that offers services to computer and other cloud devices. The most significant concern is a security in cloud implementation. The confidentiality based communication between the cloud user and service provider is essential in secured data communication. Confidentiality refers to maintenance data privacy. In cloud computing, the users send the request to server and it response the user requested data. During data communication, security is the major role in service provisioning in order to achieve the higher confidentiality. The basic diagram of the message communication between clients and server is shown in Figure 1.

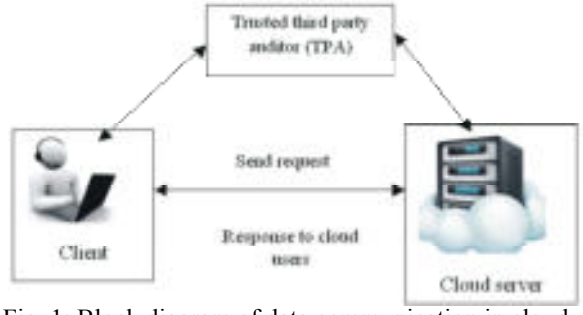

Fig. 1: Block diagram of data communication in cloud

Figure 1 illustrates the block diagram of cloud data communication. The cloud user sends the request to cloud server. The third- party auditor is a partially trusted and independent entity that can provide access and

Corresponding Author: P. Muthusamy, Research Scholar, Department of Computer Science & Engg.,
Anna University, Chennai - 600 025, Tamil Nadu, India.

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STUDIES ON RELATIONSHIP BETWEEN COMPRESSIVE AND SPLITTING TENSILE STRENGTH OF HIGH PERFORMANCE CONCRETE

K. Athi Gajendran[1], R. Anuradha[2] and G. S. Venkatasubramani[3]
[1]Karpagam University, Coimbatore, Tamil Nadu, India
[2]Department of Civil Engineering, SNS College of Technology, Coimbatore, India
[3]Paavai Engineering College, Rasipuram, Tamil Nadu, India
E-Mail: anuradhastalin@gmail.com

ABSTRACT

This experimental study is intended to identify the relationship between compressive strength and splitting tensile strength of high performance concrete. For this purpose the applicability of existing relationship between the Compressive strength and Splitting tensile strength of Concrete was examined. The commonly accepted 0.5 power relationship as per IS 456-2000 was investigated and then a similar kind of relationship developed for High performance Concrete. M60 grade HPC mixes incorporating different percentages of high reactivity metakaolin and silica fume by weight of cement along with some suitable super plasticizer. The results of the study indicate that the strength properties of HPC mixes improved by incorporating metakoalin and silica fume up to a desirable content of 15% and 5% respectively by weight of cement. It was analyzed from the test result that the Compressive strength and splitting tensile Strength were related together and the 0.5 power relationship was found to be inaccurate. Thus the alternative relations were proposed for the High performance Concrete with the support of results and figures.

Key words: high performance concrete, fly ash, metakaolin, tensile strength, compressive strength, silica fume.

1. INTRODUCTION

The global warming is caused by emission of green house gases such as carbon dioxide, carbon monoxide into the atmosphere (Elahi. A, *et al* 2010). In terms of global warming the High performance technology could significantly reduce the carbon dioxide emission into the atmosphere caused by cement industries. The IS 456-2000 code represents the relationship between the concrete flexural tensile strength (f_t) and the Compressive strength (f_{ck}) by $f_t = 0.7(f_{ck})^{0.5}$. The American concrete Institute code ACI 318-95[4] defines the relationship between modulus of rupture (f_r) and the Compressive strength (f_{ck}) by $f_r = 0.56(f_{ck})^{0.5}$ and also recommends the relationship between the modulus of rupture f_r and the Compressive strength (f_{ck}) by $f_r = 0.62(f_{ck})^{0.5}$. The Canadian code 1994 defines only one value for the modulus of rupture up to the concrete strength of 80Mpa, namely, $f_r = 0.6(f_{ck})^{0.5}$. It has been accepted by the Concrete researchers as well as the ACI that the 0.5 power relationship exists between the tensile strength and Compressive strength of Concrete. Investigations have also conducted for finding the applicability of this 0.5 power relationship to High performance Concrete. In order to predict several relations for calculating tensile strength from the compressive strength, it has not been clearly established for the various grades of High performance Concrete. Oluokun, *et al.*, 1991 suggested that the Splitting tensile strength is not necessarily proportional to the 0.5 power of Compressive strength and predicted that the tensile strength is proportional to 0.79 power of cylinder Compressive strength.

2. EXPERIMENTAL PROGRAMME

2.1 Materials used

The materials used for making high performance concrete specimens are low calcium fly ash as the source material, River sand, coarse aggregate as the filler, and water and super plasticizer as workability measure. In this investigation, class F type of fly ash is obtained from Metur power plant with fineness modulus and specific gravity were 7.86 and 2.21, respectively.

The fineness modulus and specific gravity of river sand were 3.12 and 2.64.

2.2 Metakaolin

Sabir B.B, *et al.*, 2001 suggested that Metakaolin is compatible with most concrete admixtures, such as super plasticizers, retarders, accelerators, etc. Based on previous experience, replacing 10-15% of the cement with Metakaolin gives us an optimal performance.

2.3 Silica fume

Silica Fume is a very reactive and effective pozzolanic material due to its fine particle size and high purity of SiO2 (99.5%) content. It enhances the

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Seismic Response of RC Frame with infilled wall using confinement

[1]P.Jagadeesan, [2]T.Palanisamy
[1]Associate Professor, Civil Engineering Department,
Paavai Engineering College, Namakkal, Tamilnadu

Abstract: This paper presents an analysis on performance-based seismic evaluation of G+14 RC frame building with masonry infill (MI) and shear wall (SW) for lift using Non-linear Static Pushover analysis with SAP2000v14 software for three different models i.e., Model-1: RC bare frame, Model-2: RC frame with MI wall (Soft storey) and Model-3: RC frame with MI wall and SW for lift (Soft storey). Result indicates, maximum displacement for Model-1 i.e., 0.3346m, Model-2 & 3 gave displacement of 0.0904m and 0.0718m respectively. These results clearly show, the stiffening in Model-2 is increased to 72.98% and for Model-3 is 78.54% compared to bare frame

Keywords: Masonry Infill, Shear Wall, Pushover Analysis, Displacement, Drift, Stiffness, Hinge Formations.

1.0 INTRODUCTION

Recently, there has been a considerable increase in the tall buildings for both residential and commercial and the modern trend is towards more tall and slender structures. Thus the effects of lateral loads like wind loads, earthquake load and blast force are attaining increasing importance.

Reinforced concrete (RC) frame buildings with masonry infill walls and shear wall for lift have been widely constructed for commercial, industrial and multi-storeyed residential apartments appears to be in seismic regions worldwide. Masonry infill (MI) walls and shear walls for lift plays a vital role in resisting the lateral seismic loads on building. Thus introduction of MI and shear walls for lift in RC frames changes the lateral-load transfer mechanism, which is responsible for reduction in bending moments and increase in axial forces. The Non-linear static pushover analysis is becoming a popular tool for seismic performance evaluation of existing and new structures. The purpose of pushover analysis is to evaluate the expected performance of structural systems, by estimating its strength and deformation demands in design earthquakes by means of static inelastic analysis. Comparing these demands to available capacities at the performance levels of interest, the design can be carried out. The evaluation is based on an assessment of important performance parameters including inter-storey drift, base shear, hinge formation and inelastic element deformation.

2.0 LITERATURE REVIEW

Venkata Sairam Kumar.N, Surendra Babu.R and Usha Kranti.J [1]; presented that shear walls are structural systems which provide stability to structures from lateral loads like wind, seismic loads etc. These are constructed by reinforced concrete. Shear walls resist major portions of lateral loads in the lower portion of the buildings and the frame supports the lateral loads in the upper portions of building which is suited for soft storey high rise building. In India base floors are used for parking and garages or offices and upper floors are used for residential purposes.

Konuralp Girgin and Kutlu Darılmaz [2]; have suggested that, Structural frames are often infilled with infilled walls serving as partitions. Although the infills usually are not considered in the structural analysis and design, their influence on the seismic behaviour of the infilled frame structures is considerable. In the above

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Non-Linear Pushover Analysis of RC Frame under Static Lateral Loading

P JAGADEESAN[1] AND T PALANISAMY[2]

[1]Department of Civil Engineering, Paavai Engineering College , Namakkal District, Tamilnadu, India – 637018
[2]Department of Civil Engineering, K.S.R.College of Engineering, Tiruchengode, Namakkal District, Tamilnadu, India – 637 215

Email: jagadeesan.civil@gmail.com, tpscivil_05@yahoo.com

Abstract: An experimental study has been carried on one-fifth size of single bay two storey Reinforced concrete (RC) bare frame model and affirmed with non-linear analytical model by using software SAP2000. The specimen is subjected to static lateral load which is acting at the top storey level of the frame. The non-linear analysis result of RC frame which describes the load-deflection curve, stiffness, ductility and failure mechanism of RC frame. The analytical results are compared with experimental results. The pushover analysis helps to study the plastic hinge analysis of RC framed structures.

Keywords: *Non-linear analysis, stiffness, ductility, plastic hinges.*

1. Introduction

The pushover analysis is a static non-linear analysis which is gradually increasing lateral loads. The analysis is carried out up to failure and it enables the determination of collapse load and ductility capacity of framed structure. This type of analysis is used to identify the weakness in structures. The SAP2000 is one of the powerful tools which is used for evaluating the performance of non-linear analysis of existing and new structures. This software identifies the performance of the model in various ways at an immediate occupancy level, life safety level and collapse prevention level.

The pushover analysis is performed through monotonically increasing pattern of lateral forces. A characteristic force-displacement relationship can also be determined[2]. Shah et.al[5] studied the seismic performance of RC framed structure under conventional beam and beam with post tensioned(PT) tendons. Static nonlinear pushover analysis was carried out for models and it was generated by using SAP2000. The results indicate that the seismic performance for the RC framed structure with PT beams is also within the acceptable limit. In addition, Vijayakumar et.al[7] evaluated the non-linear static analysis of existing reinforced concrete building under zone-III. The pushover analysis shows the pushover curves, capacity spectrum, plastic hinges and performance level of the existing building and it is clearly mentioned that more accurate seismic performance of the building by progression of damage or failure can be taken. Pankaj agarwal et.al[1] also obtained pushover curves of one-fourth size of single bay single storey RC frame model. It has been used to calibrate the non-linear analytical model of the frame. The effective stiffness, yield load and ultimate load were observed and compared with experimental results.

The non-linear pushover analysis is a simple intermediate solution to solve the complex problem of force and deformation from service load on structures. Vasanth acharya et.al.,[6] were studied a multistory frame structure by push over analysis. From non-linear analysis, base shear Vs displacement, effect of strength irregularities in frame structures were observed. Poluraju et.al[3] also investigated the performance of framed structures under a non-linear pushover analysis based on static loading. The load-deflection curves, plastic hinge mechanism and capacity spectrum were studied.

From the review of literature, it is clearly observed that analytical study of non-linear analysis of RC frame up to failure stage is carried out by pushover analysis using SAP2000. This paper deals with the study of single bay two storey RC frame which has been studied both experimentally and analytically using SAP2000.

2. Research significance

The present study is to evaluate the behaviour of two storey single bay bare frame subjected to static lateral loading. The experimental and analytical method of non-linear analysis using SAP2000 was planned to study the behaviour of reinforced concrete structures. This study discusses the pushover curve, stiffness,

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Strengthening of Brick Masonry Using Basalt Fiber Reinforced Cement Mortar

P.Jagadeesan*[1] and T.Palanisamy[2]

[1]Department of Civil Engineering, Paavai Engineering College, Pachal, Namakkal Dt. Tamilnadu, India
[2]Department of Civil Engineering, K.S.R.College of Engineering, Tiruchengode, Namakkal Dt. Tamilnadu, India

Abstract: Brick masonry is one of the primary structures and it plays a role in Reinforced Concrete (RC) frame structure. It is very weak in tension and has low ductility response. Normally in brick masonry, cement mortar reaches failure before brick attains the failure. For strengthening the brick masonry, it is essential to increase the strength of the cement mortar. Basalt fiber is added with cement mortar in different proportions as 0.5%, 1% and 1.5% of weight of cement. Compressive strength and Young's modulus of brick masonry were tested with and without of basalt fiber in cement mortar. Similarly, cube compressive strength of cement mortar was also tested in the same manner. The experimental results show that 1% of basalt fiber in the cement mortar gives the optimum value of properties of the brick masonry.
Keywords : Brick masonry, Cement mortar, Basalt fiber.

1. Introduction

Brick is one of significant material which is utilized as construction material in brick masonry structure. Brick masonry is the combination of brick and cement mortar with desired design mix proportions from available natural and artificial materials. Brick is oftenly used in both structural and non-structural elements because of the availability of the same from neighbour industries. When compare to steel and concrete, it is very cheap material. Also brick masonry can impart as infilled wall in the openings of RC frame structure. The significant of material such as bricks and stones can improve the thermal resistant from mass of building and can protect the building from fire. Another important parameter is cement mortar and it is utilized to bind the bricks together. The cement mortar is made up of cement, fine aggregate and water with desired water/cement ratio. In general, brick masonry is very strong in compression but weak in tension. So it is necessary to enhance the ductility of brick masonry in RC frame structures. When compare to bare frame, the infilled wall which is present in multi-storey building, gives a significant contribution in stiffness, energy dissipation capacity and reduce the collapse risk[1]. Therefore, fiber is one of the necessary materials and it mixed with the cement mortar. The main role of fiber is to improve the ductility of brick masonry and avoids cement mortar joint failure in the brick masonry structure. Fiber which is used in cement mortar or concrete of structural components is discontinuous, discrete of reinforcing material, having certain characteristics properties. Normally, steel fiber, synthetic fiber and natural fibers are used in construction industry. Mostly fibers are increasing the tensile strength, durability and toughness of the concrete, reduce the air voids and control creep of concrete. In recent years, many research efforts are there to utilize the fiber for the production of concrete in the construction Industry. The utilization of fibers in cement mortar is lesser because cement mortar employs a vital role in non-structural elements like infilled wall, pavement block and light weight structures. Besides, natural fibers are less

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Securing Internet Banking with a Two - Shares Visual Cryptography Secret Image

Aparnaa. K. S.
Department of Computer Science and Engineering,
Paavai Engineering College,
Anna University,
Chennai, Tamil Nadu, India

Sathyasundaram. M.
Department of Computer Science,
Paavai Engineering College,
Anna University,
Chennai, Tamil Nadu, India

Santhi. P.
Department of Computer Science and Engineering,
Paavai Engineering College,
Anna University,
Chennai, Tamil Nadu, India

***Abstract*— Phishing is an illegal attempt to steal the sensitive personal information of any individual or organization without their consent. This information leakage in the internet banking will lead to a huge threat to the enormously increasing online bankers in day-to-day life. A new approach for phishing websites identification and securing Banking customers' personal data from phishing attackers is introduced. 'Original Personal Security Image' CAPTCHA is chosen individually by Client using their self preferred text and then create an image with overlapping Text over a dummy background. Later, splitting it into two shares and store those in separate databases like server and client level database created to serve as intermediary database that asks some questions about the security text provided by the client during the security image creation (which we call CAPTCHA as graphical password (CaRP). CaRP is both a CAPTCHA and a graphical password scheme) we make them as a security key for users. The original image is achieved only if client share CaRP1 is merged with server share CaRP2 i.e. CaRP1 + CaRP2.**

Index terms*— Banking, Internet, Network security, Online, Phishing, Security.

1. INTRODUCTION

Online banking has become an emerging trend at present date. As rapid as the online banking increases, the attacks over the online account also increases. One of such attacks is the Phishing attack. This attack is said to be the attempt by any individual or a group who are involved in illegal activity of stealing the personal confidential information of online users through some fake or look-a-like websites of an existing authorized website. It is a form of performing personal identity theft through internet that focuses to store the sensitive personal data. This data includes their online banking passwords and other account information of the users. So many reports were made over these phishing attacks. Such attacks have been noticed to be escalating in the number of attacks along with increasing online customers and sophistication. To provide improved security from leaking of confidential information we need to switch over to an even more reliable protection scheme to ensure safe networking of transactions. Online bank customers had always been the favorite targets of those who involve in phishing attacks, so that the account details of those customers can fetch them more money in just few seconds.

At present, many bank customers use online transactions frequently. So, the customer will have a set of username and password to access the bank account. These are very sensitive and a confidential information. When these fall into wrong hands of the phishing attackers, the information can be used by the attacker to access the bank account. This will lead to a huge loss to the customer. Unfortunately many people fall into the scams. This threatens the security system of online banking by spreading the fear among customers.

1.1. OVERVIEW

Now-a-days where online banking has been increasing rapidly, sadly, the Phishing scams are increasing in same pace. The most used two methods of attacking by them are

(i) Email phishing
(ii) Website phishing

'Email Phishing' involves the sending of a fake mail to the victim and requesting them to provide confidential information like an established organization. This can be avoided by just being aware of one fact that no legitimate bank will ask to give your account password in any emails that they send you. The process of creating a look-a-like fake website of an established organization and stealing the data from the user is referred as 'Website Phishing'. This can be avoided by verifying whether the website you are at is a secured website or not. But verifying every time is not always possible even to expert customer. So this made rise to develop some reliable techniques to overcome 'Website Phishing'.

Unlike email phishing the victims of website phishing can lead to huge number of victims because it is tough to detect if it is an authorized site or not by novice users. Even experts can become victims because of increased online purchases which is done mostly through pop-up window for payments.

1.2. EXISTING SYSTEM

The existing system makes use of a 'Security image' personally chosen by the client during the process of signing up. Then on each and every Log-IN process, first the Username or User Id is requested to be entered. The next step

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A Systematic Big Data Study Using HDFS and Map Reduce

S.Lavanya[1], N.R.Vikram[2], M.Revathi[3]
Assistant Professor, CSE, Paavai Engineering College, Namakkal, India

***Abstract*— In modern beings, big data plays a vital role in processing/analyzing a large set of datasets. Similar to data mining, big data analytics provide an insight to uncover hidden patterns and useful information, in order to make better decisions. There are various techniques available to perform big data analytics. This paper provides a vision on big data, Hadoop, components of HDFS and working of MapReduce framework. It also offers creation and execution of MapReduce program in Java.**

***Index Terms*— Big data, Map reduce, Hadoop**

1. INTRODUCTION

What is Big Data?

Big Data is a data that exceeds the processing capacity of conventional database systems. The data is too big, moves too fast, or doesn't fit the structures of your database architectures.

Big Data is a common buzzword in the world of IT nowadays and it describes the realization of greater business intelligence by storing, processing and analyzing data that was previously ignored due to the limitations of traditional data management technologies.

Big Data applies to information that can't be processed or analyzed using traditional processes or tools. Increasingly, organizations today are facing more and more Big Data challenges. They have access to a wealth of information, but they don't know how to get value out of it because it is sitting in its most raw form or in a semi structured or unstructured format; and as a result, they don't even know whether it's worth keeping (or even able to keep it for that matter).

Big Data era is in full force today because the world is changing.

1.1 Characteristics of Big Data

The characteristics of big data are often defined as the three Vs:

1. Volume
2. Variety
3. Velocity

1.2 The Volume of Data

The sheer volume of data being stored today is exploding. In the year 2000, 800,000 petabytes (PB) of data were stored in the world. Of course, a lot of the data that's being created today isn't analyzed at all and that's another problem we're trying to address with Big Insights. We expect this number to reach 35 zettabytes (ZB) by 2020. Twitter alone generates more than 7 terabytes (TB) of data every day, Facebook 10 TB, and some enterprises generate terabytes (and even Exabyte's) of data every hour of every day of the year.

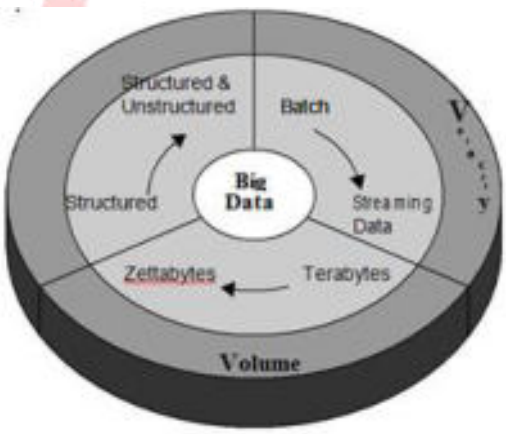

Fig 1 Volume of Big Data

1.3 The Velocity of Data

A conventional understanding of velocity typically considers how quickly the data is arriving and stored, and its associated rates of retrieval i.e. the speed at which the data is flowing. Big Data includes all types of data:

1. Structured: The data has a schema, or a schema can be easily assigned to it.
2. Semi-structured: Has some structure, but typically columns are often missing or rows have their own unique columns.
3. Unstructured: Data includes various structures like images, audio, video, etc.

Why is Big Data important?

Big Data is well suited for solving information challenges and they become even more vital when used in conjunction with Big Data platform.

Conventional database technologies are an important, and relevant, part of an overall analytic solution. In fact,

Big Data solutions are ideal for analyzing not only raw structured data, but semistructured and unstructured data from a wide variety of sources.

Big Data solutions are ideal when all, or most, of the data needs to be analyzed versus a sample of the data; or a sampling of data isn't nearly as effective as a larger set of data from which to derive analysis.

Big Data solutions are ideal for iterative and exploratory analysis when business measures on data are not predetermined.

2. ABOUT HADOOP

Hadoop is a top-level Apache project in the Apache

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AN IMPROVED PRIVACY POLICY INFERENCE OVER THE SOCIALLY SHARED IMAGES IN SOCIAL WEBSITES

Vanitha.A, PG Scholar Department of Computer Science Engineering
Paavai Engineering College, Namakkal,
Magendiran.N, Asso.Prof, Department of Computer Science Engineering
Paavai Engineering College, Namakkal.

Abstract:

In this project, we discuss how to prevent users' passwords from being stolen by adversaries in online environments and automated teller machines. We propose differentiated virtual password mechanisms in which a user has the freedom to choose a virtual password scheme ranging from weak security to strong security, where a virtual password requires a small amount of human computing to secure users passwords. The tradeoff is that the stronger the scheme, the more complex the scheme may be. Among the schemes, we have a default method, system recommended functions, user-specified functions, user-specified programs, and so on. A function/program is used to implement the virtual password concept with a tradeoff of security for complexity requiring a small amount of human computing. We further propose several functions to serve as system recommended functions and provide a security analysis. For user-specified functions, we adopt secret little functions in which security is enhanced by hiding secret functions/algorithms.

Key words- Adversaries, Virtual password, Secret algorithm.

1. INTRODUCTION

Most content sharing websites allow users to enter their privacy preferences. Unfortunately, recent studies have shown that users struggle to set up and maintain such privacy settings. One of the main reasons provided is that given the amount of shared information this process can be tedious and error-prone. Therefore, many have acknowledged the need of policy recommendation systems which can assist users to easily and properly configure privacy settings. However, existing proposals for automating privacy settings appear to be inadequate to address the unique privacy needs of images, due to the amount of information implicitly carried within images, and their relationship with the online environment wherein they are exposed. The A3P system consists of two main components: A3P-core and A3P-social. The overall data flow is the following, when a user uploads an image, the image will be first sent to the A3P-core. The A3P-core classifies the image and determines whether there is a need to invoke the A3P-social. In most cases, the A3P-core predicts policies for the users directly based on their historical behavior. The A3P-social groups users into social communities with similar social context and privacy preferences, and continuously monitors the social groups. When the A3P- social is invoked, it automatically identifies the social group for the user and sends back the information about the group to the A3P-core for policy prediction. At the end, the predicted policy will be displayed to the user. If the user is fully satisfied by the predicted policy, he or she can just accept it. Otherwise, the user can choose to revise the policy. The actual policy will be stored in the policy repository of the system for the policy prediction of future uploads.

2. EXISTING SYSTEM

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Efficient Subspace Clustering of High Dimensional Breast Cancer Gene Set for Multi Variant Gene Population (MVGP) Using Fuzzy Rule Sets and Multi Gene Impact Matrix

[1]N. Magendiran and [2]S. Selvarajan

[1]CSE at Paavai Engineering College, Namakkal, Tamilnadu, India
[2]College of Engineering, Rasipuram, Tamilnadu, India

Abstract: The breast cancer is the most threatening factor of women's lifestyle and the reason of the disease has many factors. Still the gene factor has more influence in the generation of breast cancer where the early diagnosis and prevention is essential. There are many approaches has been discussed in the literature, but the identification and selection of a set of genes that influence the disease are still becoming complicated. A multi-variant approach for gene selection is proposed, by performing high dimensional subspace clustering. With the given data set, the method generates a set of rules and unlike generic fuzzy rules the method splits the range values into the number of parts and based on that the rules are generated. Also, according to the different range values, the method generates a multi-gene impact matrix where the frequency of range values of each rule is stored. The data set is clustered according to the generated rules and from the generated rules the gene selection is performed. For the gene selection, the method computes the multi-gene frequency measure that represents how depth the gene has an impact on the classification of disease. The proposed method produces an efficient classification of genes in the influence of breast cancer.

Key words: Gene Selection · High-Dimensional Clustering · Multi Gene Impact Matrix · Fuzzy Rule Sets

INTRODUCTION

The growth of data sets in their dimension increases the challenges in cluster them, where the higher dimensional space requires more sophisticated approaches to clustering the data sets. In any high dimensional space, identifying the subspace is the most important task that has to be performed in an efficient manner. For a breast cancer data set, there are a number of genes influencing or taking part in the appearance of the cancer in the women. To identify them or to cluster such data set the genes are the most important factor that participates in the clustering approach.

Gene selection in high dimensional breast cancer dataset clustering is the most important task and how the gene selection is performed is the big question here. Not all the genes have a great impact, but all the genes have some impact on the cause of breast cancer. To find a strategic approach to selecting the gene selection there must be some efficient approach to be there. Unfortunately, the existing approach misses the case of gene selection in a modern, sophisticated approach and has no efficient solution to perform the task of gene selection.

The breast cancer can be classified into many cases and to identify the exact subspace we must come up with more efficient measures and gene selection approaches. For example, a subset of genes may be the cause of a specific type of cancer, but they may not have any impact in the presence of another type of cancer. So the gene selection is the most important task that could be used to predict the future appearance of breast cancer. So for the prediction of the breast cancer the gene selection approach can be used which helps early detection and cure of cancer in many ways.

The general fuzzy rule sets are nothing but the range of values for each rule. It contains a number of rules for each case of breast cancer and has a range of values for each gene participated in the appearance of cancer cells. Unlike generic one, the method generates a modern fuzzy

Corresponding Author: N. Magendiran, CSE at Paavai Engineering College, Namakkal, Tamilnadu, India.

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AN EFFICIENT DATA MINING CONSENSUS CLUSTERING AND NAVIE BAYESIAN CLASSIFICATION FOR BREAST CANCER PROGNOSIS PREDICTION

[1]Vasanthi.R, [2]D.Bhanumathi
Department of Computer Science and Engineering, Paavai Engineering College, Namakkal, India

Abstract-The healthcare environment is generally perceived as being information rich yet knowledge poor .There is a wealth of data available within the healthcare systems. Valuable knowledge can be discovered from application of data mining techniques in healthcare system. In this paper, briefly examine the potential use of classification based on data mining technique Naive Bayes to massive volume of healthcare data. For data preprocessing and effective decision making Naïve Bayes classifier is used. This is an extension of naive Bayes to imprecise probabilities that aims at delivering robust classifications also when dealing with small or incomplete data sets. Using medical profiles such as age, sex, obesity and blood sugar it can predict the likelihood of patients getting a breast cancer disease. It enables significant knowledge, e.g. patterns, relationships between medical factors related to breast cancer disease, to be established. To analyze several different clustering techniques and apply them to a particular data set of breast cancer data.

I INTRODUCTI

Knowledge discovery in databases is well-defined process consistingof several distinct steps. Data mining is the core step, which results in the discovery of hidden but useful knowledge from massive databases. A formal definition of Knowledge discovery in databases is given as follows: “Data mining is the non trivial extraction of implicit previously unknown and potentially useful information about data”.Data mining technology provides a user-oriented approach to novel and hidden patterns in the data. The discovered knowledge can be used by the healthcare administrators to improve the quality of service. The discovered knowledge can also be used by the medical practitioners to reduce the number of adverse drug effect, to suggest less expensive therapeutically equivalent alternatives. Anticipating patient’s future behavior on the given history is one of the important applications of data mining techniques that can be used in health care management. A major challenge facing healthcare organizations (hospitals, medical centers) is the provision of quality services at affordable costs.

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An Optimized User Behavior Prediction Model Using Genetic Algorithm On Mobile Web Structure

M. I. Thariq Hussan[1] and Dr. B. Kalaavathi[2]
[1] Research Scholar & Associate Professor, Department of Computer Science and Engineering,
Paavai Engineering College, Namakkal, India
[e-mail: thariqhussain@rediffmail.com]
[2] Professor & Head, Department of Computer Science and Engineering,
KSR Institute for Engineering & Technology, Tiruchengode, India
[e-mail: kalabhuvanesh@yahoo.com]
*Corresponding author: M. I. Thariq Hussan

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Abstract

With the advancement of mobile web environments, identification and analysis of the user behavior play a significant role and remains a challenging task to implement with variations observed in the model. This paper presents an efficient method for mining optimized user behavior prediction model using genetic algorithm on mobile web structure. The framework of optimized user behavior prediction model integrates the temporary and permanent register information and is stored immediately in the form of integrated logs which have higher precision and minimize the time for determining user behavior. Then by applying the temporal characteristics, suitable time interval table is obtained by segmenting the logs. The suitable time interval table that split the huge data logs is obtained using genetic algorithm. Existing cluster based temporal mobile sequential arrangement provide efficiency without bringing down the accuracy but compromise precision during the prediction of user behavior. To efficiently discover the mobile users' behavior, prediction model is associated with region and requested services, a method called optimized user behavior Prediction Model using Genetic Algorithm (PM-GA) on mobile web structure is introduced. This paper also provides a technique called MAA during the increase in the number of models related to the region and requested services are observed. Based on our analysis, we content that PM-GA provides improved performance in terms of precision, number of mobile models generated, execution time and increasing the prediction accuracy. Experiments are conducted with different parameter on real dataset in mobile web

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Research article

ESTIMATION OF ACCURACY LEVELS USING MULTILEVEL CONDITIONAL PROBABILITY BOOTH MULTIPLER

R.DHIVYA[1], R.ARANGASAMY[2]

[1] *PG Scholar , Paavai Engineering College, Namakkal,*

[2] *M .E., head of the department, Department of ECE, Paavai engineering college,Namakkal*

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ABSTRACT: *This paper determines about reducing truncation error that enters into fixed width Booth multiplier designs. Fixed width booth multiplier compensates for the Stop error with Multi-level conditional probability Value. The proposed multilevel conditional probability uses all non-zero code to estimate the truncation error and to achieve higher Accuracy levels. Further, the simple and small multilevel conditional probability compensated circuit is proposed. To achieve the proposed multilevel conditional probability booth multipliers low cost high accuracy performance.*

1. INTROUCTION

Multiplication is one of the most consuming field arithmetic operations in high performance circuits. Fixed width multiplier takes n number of inputs and n is the number of outputs produced. Combination of fixed multiplier and multiplier Post stump, cuts half of the LSB produces the result after calculating all the products and gives a high degree of accuracy, but it accepts large circuit area .Direct cut Multiplier fixed-width multiplier cuts half LSBs reduce product directly to circuit area, but it produces truncation error. Compensated circuit has developed in this work to get the balance between accuracy and circuit area.

One way to speed up the multiplication is Booth encoding, which performs the various steps of the multiplication immediately and returns the number of partial products is reduced. It is an efficient algorithm for signed multiplication number, the treated both positive and negative number uniform. It multiplies two signed binary numbers in two's complement. Booth multiplication is a technique that allows small, fast multiplying circuits, the numbers multiplied by transcoding. It is used the standard methods in chip design, and offers significant improvements over the "long multiplication" technology. Most digital signal processing applications are of fixed width multipliers. In this type of multiplier, the length of the input and output bits are the same. Here Half significant parts cutting the error. Error trimmed compensated circuits in this type of multiplier used. Fixed width multiplier produce two types of truncation parts: contribution reduced multiplier, achieve high accuracy that cuts half of the LSB results after calculation of all products and it requires a large circuit area to calculate the cutting part. Direct blunt to save multiplier truncate half of

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Automatic Insulin Injection in Embedded Linear Parameter Varying Techniques for Type 1 Diabetes

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Authors: Arangasamy, R.; Sundararajan, J.; Vennila, Ila
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This article is to inject insulin for type 1 diabetes patients by pumping the insulin. The blood glucose level has to be monitored with the help of glucose tolerance test. For efficient method to control type 1 diabetes we have used embedded linear parameter varying methodology controller. The joint element between glucose sensing and insulin delivering actions is an automatic algorithm-based decision. The insulin infusion rate during hyperglycemia, exercise and nocturnal hypoglycemia are known in order to mimic the insulin release pattern generated by controller and considered in the design. The inclusion of mathematical model of relations between glucose and chosen bio-signals in the control loop generates an adequate insulin infusion pattern to compensate blood glucose variations during each chemical processing occurring in living cells. This approach of automatic algorithm for decision shows good performance in controlling glycaemia in blood glucose, ensuring insulin distillation with a delivery form closer to that generated by a healthy pancreas. The biological perspective discussed in this article namely: Regulation in healthy system, modeling methodology, ARX (Auto regressive exogenous) technique. This paper aims to achieve a better blood glucose control profile by incorporating the time-dependent uncertainties in diabetic patient parameters into formulations of optimal control using a novel approach. The time-dependent uncertainties are represented using stochastic processes and the mathematical formulation for this problem is presented. This method holds a lot of promise in reducing the wide swings of blood glucose observed in diabetic patients and preventing complications of diabetes.

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Research article

AUTOMATIC DETECTION OF TUBERCULOSIS USING ADVANCED SEGMENTATION METHODS AND SVM CLASSIFICATION

R.Dhivya[1], R. Arangasamy, M.Tech., (Ph.D)[2]

1 PG Scholar , Paavai Engineering College, Namakkal,

2 HOD ,Department of ECE, Paavai engineering college,Namakkal

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ABSTRACT: Segmentation of human bodies in images is a challenging task that can facilitate numerous applications, like scene understanding and activity recognition. In existing techniques a bottom-up methodology for automatic extraction of human bodies from single images, in the case of almost upright poses in cluttered environments. The position, dimensions, and color of the face are used for the localization of the human body, construction of the models for the upper and lower body according to anthropometric constraints, and estimation of the skin color. Different levels of segmentation granularity are combined to extract the pose with highest potential. The segments that belong to the human body arise through the joint estimation of the foreground and background during the body part search phases, which alleviates the need for exact shape matching. In order to cope with the highly dimensional pose space, scene complexity, and various human appearances, the majority of existing works require computationally complex training and template matching processes. In our proposed system the extraction of human body is from video and from the scenes of complex poses in motion vectors. In the future, we intend to deal with more complex poses, without necessarily relying on strong pose prior. Problems like missing extreme regions, such as hair, shoes, and gloves can be solved by incorporation of more masks in the search for these parts, but caution should be taken in keeping the computational complexity from rising excessively. The performance of our algorithm is measured using 40 images (43 persons) from the INRIA person dataset and 163 images from the "lab1" dataset, where the measured accuracies are 89.53% and 97.68%, respectively. Qualitative and quantitative experimental results demonstrate that our methodology outperforms state-of-the-art interactive and hybrid top-down/bottom-up approaches.

KEYWORDS – *Trajectories, Denoising, human Detection, Multi- Action Detection , Body Parts-Based Classification*

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Research article

ADVANCED IMAGE HAZE REMOVAL USING DENOISING AND DEHAZING ALGORITHM WITH COMPRESSION

G.R. Dhivya[1], S.Kumarganesh[2]

[1] PG Scholar , Paavai Engineering College, Namakkal,

[2] M .E., Associate professor ,Department of ECE, Paavai engineering college,Namakkal

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ABSTRACT:

Single image haze removal has been a demanding problem due to its ill-posed nature. Images captured in hazy weather environment often suffer from poor illumination conditions that will create a lot of impact on the outer Computer vision systems, such as video surveillance, intelligent traffic assistance system, remote sensing and space cameras soon. In proposed system, two methods for removing both haze and noise from a single image is used. The first approach is to de noise the image prior to de hazing. This serial approach essentially treats haze and noise separately, and so a second approach is proposed to simultaneously de noise and de haze using an iterative, adaptive, non-parametric regression method. Our findings show that when the noise level is precisely known a priori, simply de noising prior to de hazing performs well. When the noise level is not given, underlying errors from either low level denoising or high noising can be a intensified, and in this situation, the repetitious approach can yield superior results.

KEYWORDS – *Wiener filter, Denoising, Depth restoration Dehazing, Scene radiance recovery,*

1. Introduction

Made outdoor shooting in bad weather usually lose contrast and infidelity, of the fact that light resulting absorbed through the turbid medium and scattered as particles and water droplets in the atmosphere during the process of propagation. And there are many automated systems, the strongly on the definition of the input images, fail, usually caused by the deteriorated images. Therefore, improving the technology of image haze removal will fi t many image understanding and computer vision applications such as aerial photographs, image classification image / video retrieval, remote sensing and video analysis and recognition animals. Since concentration is the mist be seen from place to place and it is difficult, in a hazy image, the image dehazing is therefore a challenging

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Research article

REALIZATION OF FILTER ARCHITECTURES FOR APPROXIMATELY COMPUTING DWT USING RESULT - BIASED DISTRIBUTED ARITHMETIC

R.S.MENAKA [1], S.KUMARGANESH [2]

[1] *PG Scholar , Paavai Engineering College, Namakkal,*

[2] *M .E., Associate professor ,Department of ECE, Paavai engineering college,Namakkal*

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ABSTRACT: *The discrete wavelet transform is a fundamental right Block multiple systems for image compression. Implementation based on filters that normally leads required multiplications to a corresponding hardware complexity. It is a distributed arithmetic comprehensive and effective technique of applying filters without multipliers and has in the past, the discrete application exhausted Wavelet transform. This paper proposes a general method for Implementation of a discrete wavelet transform based architecture distribution Approximate arithmetic to produce results and we Explore the periodicity and symmetry of the DWT to the optimization Performance and reduce the computational redundancy. Novelty The proposed method is based on the use of the result of polarization techniques causing a very slight loss of quality of the compressed image. Facing date arithmetic architectures based on distributed computing proposals saves the discrete wavelet transform of this technique from about 21% to 26% of hardware complexity.*

1. INTRODUCTION

The discrete wavelet transform algorithms have a fixed position in the processing of signals in different fields of research and industry. How DWT provides both frequency and spatial octavescale time of the analyzed signal, you will use again and again to solve and deal ever more advanced problems. DWT algorithms were first compact supports conjugate quadrature filters is based. However, a drawback with CQFs by nonlinear effects such as spatial phase shifts in the multi-scale analysis. This is in turn biorthogonal discrete wavelet algorithms where the scale and wavelet filters are symmetrical and linear phase avoided. The BDWT algorithms are generally constructed by a ladder network called lifting scheme. The method consists of successive down and pick

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Research article

EXTRACTION HUMAN BODIES FROM VIDEO STREAM

R.Dheepamuthuvalli[1], V.Sakthivel .M.E., (Ph.D)[2]

[1] *PG Scholar , Paavai Engineering College, Namakkal,*

[2] *M .E., Associate professor ,Department of ECE, Paavai engineering college,Namakkal*

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ABSTRACT: Segmentation of human bodies in images is a challenging task that can facilitate numerous applications, like scene understanding and activity recognition. In existing techniques a bottom-up methodology for automatic extraction of human bodies from single images, in the case of almost upright poses in cluttered environments. The position, dimensions, and color of the face are used for the localization of the human body, construction of the models for the upper and lower body according to anthropometric constraints, and estimation of the skin color. Different levels of segmentation granularity are combined to extract the pose with highest potential. The segments that belong to the human body arise through the joint estimation of the foreground and background during the body part search phases, which alleviates the need for exact shape matching. In order to cope with the highly dimensional pose space, scene complexity, and various human appearances, the majority of existing works require computationally complex training and template matching processes. In our proposed system the extraction of human body is from video and from the scenes of complex poses in motion vectors. In the future, we intend to deal with more complex poses, without necessarily relying on strong pose prior. Problems like missing extreme regions, such as hair, shoes, and gloves can be solved by incorporation of more masks in the search for these parts, but caution should be taken in keeping the computational complexity from rising excessively. The performance of our algorithm is measured using 40 images (43 persons) from the INRIA person dataset and 163 images from the "lab1" dataset, where the measured accuracies are 89.53% and 97.68%, respectively. Qualitative and quantitative experimental results demonstrate that our methodology outperforms state-of-the-art interactive and hybrid top-down/bottom-up approaches.

KEYWORDS - *Trajectories, Denoising, human Detection, Multi- Action Detection , Body Parts-Based Classification*

1. INTRODUCTION

Extraction of the human body in unconstrained still images is challenging due to several factors, including shading, image noise, occlusions, background clutter, the high degree of human body deformability, and the unrestricted positions due to in and out of the image plane rotations. Knowledge about the human body region can benefit various tasks, such as determination of the human layout, recognition of actions from static images, and sign language recognition. Human body segmentation and silhouette extraction have been a common practice when videos are available in controlled environments, where background information is

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PROTECTING ALONGSIDE COLLABORATIVE ATTACKS BY MALEVOLENT KNOBS IN WSNS: A COOPERATIVE BAIT RECOGNITION APPROACH

D. Kisantini[#1], V. Sakthivel[*2]

[#1]*Paavai Engineering College, Namakkal, Tamilnadu, India*
[*2]*Assistant Professor (ECE), Paavai Engineering College, Namakkal, Tamilnadu, India*

***Abstract*—In this paper, a mechanism [so-called cooperative bait detection scheme (CBDS)] is presented that effectively detects the malicious nodes that attempt to launch grayhole/collaborative blackhole attacks. In our scheme, the address of an adjacent node is used as bait destination address to bait malicious nodes to send a reply RREP message, and malicious nodes are detected using a reverse tracing technique. Any detected malicious node is kept in a blackhole list so that all other nodes that participate to the routing of the message are alerted to stop communicating with any node in that list. Unlike previous works, the merit of CBDS lies in the fact that it integrates the proactive and reactive defense architectures to achieve the aforementioned goal.**

Keywords: Cooperative bait detection, malicious nodes, RREP messages.

I. INTRODUCTION

Due to the widespread availability of mobile devices, mobile ad hoc networks (MANETs), have been widely used for various important applications such as military crisis operations and emergency preparedness and response operations. This is primarily due to their infrastructureless property. In a MANET, each node not only works as a host but can also act as a router. While receiving data, nodes also need cooperation with each other to forward the data packets, thereby forming a wireless local area network. These great features also come with serious drawbacks from a security point of view. Indeed, the aforementioned applications impose some stringent constraints on the security of the network topology, routing, and data traffic. For instance, the presence and collaboration of malicious nodes in the network may disrupt the routing process, leading to a malfunctioning of the network operations. Many research works have focused on the security of MANETs. Most of them deal with prevention and detection approaches to combat individual misbehaving nodes. In this regard, the effectiveness of these approaches becomes weak when multiple malicious nodes collude together to initiate a collaborative attack, which may result to more devastating damages to the network. The lack of any infrastructure added with the dynamic topology feature of MANETs make these networks highly vulnerable to routing attacks such as blackhole and grayhole (known as variants of blackhole attacks). In blackhole attacks (see Fig. 1), a node transmits a malicious broadcast informing that it has the shortest path to the destination, with the goal of intercepting messages. In this case, a malicious node (so-called blackhole node) can attract all packets by using forged Route Reply (RREP) packet to falsely claim that "fake" shortest route to the destination and then discard these packets without forwarding them to the destination. In grayhole attacks, the malicious node is not initially recognized as such since it turns malicious only at a later time, preventing a trust-based security solution from detecting its presence in the network. It then selectively discards/forwards the data packets when packets go through it. In this paper, our focus is on detecting grayhole/collaborative blackhole attacks using a dynamic source routing (DSR)-based routing technique. DSR [4] involves two main processes: route discovery and route maintenance. To execute the route discovery phase, the source node broadcasts a Route Request (RREQ) packet through the network. If an intermediate node has routing information to the destination in its route cache, it will reply with a RREP to the source node. When the RREQ is forwarded to a node, the node adds its address information into the route record in the RREQ packet. When destination receives the RREQ, it can know each intermediary node's address among the route. The destination node relies on the collected routing information among the packets in order to send a reply RREP message to the source node along with the whole routing information of the established route.

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A MULTI-CLASSIFIERS-BASED APPROACH FOR PLUMB HANDOFF PROCESS IN WIRELESS DIVERSE NETWORKS: EXPOSITION AND PROBABLE

Mrs.R.Mohanapriya[#1] Mrs.S.Nandhini[*2]

[#1]*Assistance Professor, Department of ECE, Selvamm Arts & Science college, Namakkal, India*

[*2]*Research Scholar, Department. of CS, Selvamm Arts & Science college ,Namakkal, India*

Abstract- **Heterogeneous networks allow mobile nodes to take advantage of best radio facilities for their coexisting connections. Vertical handover (VHO) between them is required to perform Always Best Connected (ABC). VHO is one of the most challenging research issues for wireless networks. The traditional decision making schemes cannot meet the VHO requirements of mobile networks, and the performance may degrade severely due to the unique characteristics of mobile networking. Therefore, optimized handover management schemes, developed specifically for heterogeneous wireless networks are required. In order achieve an optimum VHO decision, this paper propose a solution to the tough VHO decision problem through a novel approach based on multiple classifiers application. Our aim is to survey recent development of this field and to present the prospective of utilizing statistical classifiers to handle the challenging VHO requirement. The architecture design of the proposed approach is presented. Various components that constitute the road map toward development of the multiclassifier based VHO scheme are discussed.**

Key Words: Network Selection, Vertical handover Heterogeneous network, MADM.

I. INTRODUCTION

The vertical handoff process involves three main phases [4], [5], namely system discovery, vertical handoff decision, and vertical handoff execution. During the system discovery phase, the mobile terminal determines which networks can be used. These networks may also advertise the supported data rates and Quality of Service (QoS) parameters. Since the users are mobile, this phase may be invoked periodically

In the vertical handoff decision phase, the mobile terminal determines whether the connections should continue using the existing selected network or be switched to another network. The decision may depend on various parameters including the type of the application (e.g., conversational, streaming), minimum bandwidth and delay required by the application, access cost, transmit power, and the user's preferences.

During the vertical handoff execution phase, the connections in the mobile terminal are re-routed from the existing network to the new network in a seamless manner. This phase also includes the authentication, authorization, and transfer of a user's context information.

Various vertical handoff decision algorithms have been proposed recently. In [6], the vertical handoff decision is formulated as a fuzzy multiple attribute decision making problem. Two ranking methods are proposed: Simple Additive Weighting (SAW) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). In [7], the network selection for vertical handoff is modeled by the Analytic Hierarchy Process (AHP) and the Grey Relational Analysis (GRA). In [8], a performance comparison among SAW, TOPSIS, GRA, and the Multiplicative Exponent Weighting (MEW) for vertical handoff decision is presented. In [4], the handoff decision mechanism is formulated as an optimization problem. Each candidate network is associated with a cost function which depends on a number of criteria, including the bandwidth, delay, and power requirement. An application oriented vertical handoff decision mechanism is proposed in [5]. A multi-layer framework for vertical handoff is proposed in [9]. In [10], a utility-based strategy for network selection is proposed. In [11], the vertical handoff decision is evaluated via a handoff cost function and a handoff threshold function which can be adapted to changes in the network environment dynamically.

Although there have been various vertical handoff algorithms proposed in the literature, our work is motivated by two particular aspects. First, the connection duration needs to be taken into account during the vertical handoff decision. Second, the processing and signaling load during the vertical handoff execution also needs to be taken into

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Research Article

Theoretical Study and Estimation of Recombination Rate and Photocurrent of Quantum Dot Solar Cell using Homotopy Analysis

[1]B. Murali Babu, [2]M. Madheswaran and [3]K.R. Kavitha
[1]Department of Electrical and Electronics Engineering, Paavai Engineering College, Namakkal-637 018,
[2]Centre for Advanced Research, Mahendra Engineering College, Mallasamudram-637 503,
[3]Department of Electronics and Communication Engineering, Sona College of Technology,
Salem-636005, Tamil Nadu, India

Abstract: The objective of this study is to develop the numerical model of InGaAs QD solar cell to describe the device characteristics. The developed model is based on Homotopy analysis which provides self-consistent and nonlinear solutions to 3D Poisson and Schrodinger equations. The exact potential and energy profile of the quantum dot accounts for the estimation of current under dark condition. The model is used in photocurrent determination of quantum dot solar cell under 1 Sun, 1.5 AM condition over a range of various solar cell parameters such as optical generation life time, quantum dot concentration and number of quantum dot layer. The quantum wavelength and quantum dot layers are used to calculate the photocurrent, recombination rate and conversion efficiency. The photocurrent has achieved its superiority with optimum quantum dot layers and wavelength. The results obtained show that the photocurrent is strongly sensitive to the above dependences and a good agreement with the experimental results was evidenced.

Keywords: Homotopy analysis, poisson equation, quantum dot, schrodinger equation, solar cell

INTRODUCTION

Photovoltaics have reached a tremendous growth during last two decades and power generation using photovoltaics plays a dominant role in addressing the future electricity needs of about 30 TW, in spite of the robust growth of nuclear and wind energy. The photovoltaic conversion of the fraction of 1.2×10^{25} TW of energy from sun's solar radiation contributes to the present and future energy needs. This enormously increases the interest of understanding quantum nano structures in solar cells. These preconditions envisioned the technological revolution and advancements in the nanotechnology devices such as Quantum well, Quantum Dot (QD) and Quantum wires. The photovoltaic technology based on materials with large cost/watts lead to third generation photovoltaics with significant lower cost and increased efficiency to the actual values. The increase in energy gaps with shrinking dimensions, strong photoluminescence, multiple exciton generations and relaxation of excited carriers realized the use of quantum dots in solar cell structures.

QDs are semiconductor nano particles, having unique properties such as narrow emission peak, broad excitation range and size dependent emission wavelength in which excitons are confined in all the three spatial dimensions. Fonseca *et al*. (1998) realized the confinement by fabricating the semiconductor in very small size and found QDs act like artificial atoms, showing controllable discrete energy levels. Sheng and Leburton (2002) modeled the vertically stacked and coupled InAs/GaAs Self-Assembled quantum Dots (SADs). It showed the strong hole localization and a non-parabolic dependence of the inter band transition energy on the electric field. It was reported that, the 3D strain field causes the anomalous quantum confined stark effect.

Three-dimensional spin-qubit quantum dot devices were modeled by Melnikov *et al*. (2005). The electronic properties of the devices based on double and triple quantum dots were studied numerically. Battacharya *et al*. (2002) presented the electrical and optical characteristics of self-organized QDs grown by molecular beam epitaxy. The importance of performing self-consistent calculations of Poisson equations was discussed by Datta (2000) and the V-I characteristics of nano scale structures were determined depending on the quantum transport mechanism.

QD solar cells have the potential to improve the efficiency for solar energy conversation by utilizing the additional photocurrent generated in QDs inserted in the intrinsic region of the structure. Milicic *et al*. (2000) discussed the placing of QDs to provide high absorption

Corresponding Author: B. MuraliBabu, Department of Electrical and Electronics Engineering, Paavai Engineering College, Namakkal-637 018, Tamil Nadu, India
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ENDOCARDIUM SEGMENTATION: AN APPROACH USING LOCAL CHAN VESE MODEL WITH RADIAL CHARGE FITTING CURVE

S. Nirmala[1] and S. Rajalaxmi[2]
[1]*Muthayammal Engineering College, India*
E-mail: nirmala.ramkamal@gmail.com
[2]*Department of Electrical and Electronics Engineering, Paavai Engineering College, India*
E-mail: rajalaxmisakthivelpec@paavai.edu.in

Abstract

Wall tracking and Endocardium segmentation in Echocardiography images is a prime requirement for the diagnosis of major cardiac diseases. To avoid manual procedures of wall tracing and to provide a quantitative aid in the diagnosis procedure to the cardiologist, a new approach based on Local Chan Vese Model is proposed. The Model is based on curve evolution, local statistical function and level set method, and the accuracy of result is based on contour placement. This initial contour is generated through Radial Charge Fitting curve which is an auto generated curve based on Gauss Law. It is found that the inclusion of Radial Charge Fitting Curve with Local Chan Vese Model provides an accurate Endocardium Segmentation. The proposed method is compared with the Local Chan Vese Model with manual initial contours. It is proved that the proposed Local Chan Vese Model with Radial Charge Fitting Curve is performing accurate Endocardium Segmentation with minimal iterations.

Keywords:

Endocardium, Segmentation, Local Chan Vese Model, Initial Contour, Gauss Law, Electric Field Intensity

1. INTRODUCTION

Endocardium segmentation is an essential step in the diagnosis of cardiac diseases, as it is to picture the geometry of the chambers of the heart. Especially the geometry of left ventricle plays a major role in analyzing Left Ventricular Hypertrophy and its associated diseases. This endocardium segmentation should be more accurate in the language of cardiologist to have a quantitative analysis of the wall thickness, dimension of the heart chambers and volumetric parameters. Many models are available in the literature, out of which Level Set methods and other curve evolution methods have captured their own importance. Active contour models and Chan Vese models have their own priority in the field of image segmentation. The active contour model, also popularly called as snakes, was started with an initial curve around the object to be segmented [1]. The evolving curve has to converge based on energy minimizing model till the exact boundary of the object is attained. Sensitivity to initial conditions and topological changes associated with the evolving curve are the main limitations of snakes. Many methods based on active contour models were proposed; out of which the Level set method [2] captured its own importance. In Level set method, a deformable curve front, called the Level set function, was evolved to the object boundary and it possessed interesting elastic nature. This eliminated the problems related to topological changes. The methods were implemented by obtaining the numerical solution of time dependent Partial Differential equations (PDEs) which governs the evolution of level set function. The gradient of the given image was the main parameter in edge based level set methods [3]. These methods are suitable only for detecting the objects whose edges are defined by gradient. This may lead the evolving curve to pass through the true boundaries.

A general image segmentation model was proposed by Mumford and Shah [4]. In this model, the image is divided into partitions. In each partition, the original image is approximated by a smoothing function. An optimal segmentation is obtained by minimizing the Mumford Shah functional. This functional was later effectively minimized and solved by Chan and Vese by using Level set functions [5]. The authors utilized global region information into the Mumford Shah functional for providing a strong stabilization to topological variations. This Chan Vese model proved to be an effective segmentation as it used global image statistics and level set function. The initial Chan Vese model suffered from certain limitations. It provides poor image segmentation for intensity inhomogeneity images. It becomes time consuming if periodical re-initialization step is adopted. The most important limitation is the placement of initial contour in the image to be segmented. The segmentation results may vary and increase the computational load based on the initial contour position.

Many researches have been carried out to solve the limitations of Chan Vese Model. This has provided a gateway for multiphase level set formulation proposed by Chan and Vese [6]. This has involved computational complexity and required the placement of initial contour near the boundary. Models have been developed without solving the PDEs to reduce the computational load [7, 8]. But they are still sensitive to the selection and location of initial curves. To provide effective segmentation on intensity inhomogeneity images, new works were proposed [9-15], which minimized the sum of region based information and local energy. All the proposed works suffer from computational complexity and position of initial contours. A new initialization curve was proposed [16], in which the initial curve is found based on the fidelity term. The method was a failure as it was time consuming and one dimensional search method. Another initial contour was generated by connecting the edge points obtained by canny detector and morphological filter [17]. But the method was effective only for simple images. Recently, a new method called Local Chan Vese model has been proposed [18] in which the energy functional has been updated with new parameters. These have worked well for intensity inhomogeneity images, but still sensitive to the position of initial contour.

This paper has worked on a new initialization procedure for segmentation using Local Chan Vese Model. The initial contour, called the Radial Fitting Curve is generated using Gauss Law [19] and fitting of this initial contour to the exact endocardium

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Automated Endo Fitting Curve for Initialization of Segmentation Based on Chan Vese Model

S. Rajalaxmi* and S. Nirmala

Muthayammal Centre for Advanced Research, Muthayammal Engineering College, Rasipuram, Namakkal 637408, Tamilnadu, India

The placement of initial contour plays an important role in the segmentation using Chan Vese Model. This initial contour is a factor determining the computational complexity of the segmentation procedure. This work aims at framing the initial curve to aid the performance of Chan Vese Model. Two methods namely straight charge fitting curve and radial charge fitting curve are proposed to develop the initial contour called the 'Endo Fitting Curve' with the application of electrostatic field and Gauss law. The proposed curve works well for intensity inhomogeneity images and it is demonstrated on 2D Echocardiography images. The Endo Fitting Curves are developed within 0.1 to 0.2 seconds and can be better tuned using Local Chan Vese Model. This contour acts as a pre-segmentation procedure to reduce the computational cost and to incorporate automated segmentation. Comparisons are made with other initial contours used for Chan Vese Model and other active contour models and the obtained results are illustrated.

Keywords: Medical Image Segmentation, Initial Contour, Chan Vese Model, Endocardium, Gauss Law, Electric Field Intensity, Charge.

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1. INTRODUCTION

Image segmentation is of primary importance in the field of medical imaging as it facilitates the partition of region of interest. Medical Image segmentation helps in visualizing challenging problems and to partition anatomical objects of interest.[1] This promotes the visualization of pathological deformations and helps in the quantitative measurements of area, volume and in the analysis of the dynamic behavior of anatomical structures. Segmentation of ultrasound images is a great challenge due to its inherent speckle noise and artifacts. Echocardiography image segmentation plays a nontrivial role as it provides a vibrant statistics of moving structures. The main aim of Endocardium segmentation from Echocardiography image lies in the analysis of the cardiac function based on its wall thickness and related parameters.

Active contour models and Chan Vese models have their own priority in the field of image segmentation. The active contour model, also popularly called as snakes, was started with an initial curve around the object to be segmented.[2] The evolving curve has to converge based on energy minimizing model till the exact boundary of the object is attained. Sensitivity to initial conditions and topological changes associated with the evolving curve are the main limitations of snakes. Many methods based on active contour models were proposed; out of which the Level set method[3–6] captured its own importance. In Level set method, a deformable curve front, called the Level set function, was evolved to the object boundary and it possessed interesting elastic nature. This eliminated the problems related to topological changes. The methods were implemented by obtaining the numerical solution of time dependent Partial Differential equations (PDEs) which governs the evolution of level set function. The gradient of the given image was the main parameter in edge based level set methods.[7] These methods are suitable only for detecting the objects whose edges are defined by gradient. This may lead the evolving curve to pass through the true boundaries.

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*Author to whom correspondence should be addressed.

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Reduction of Components in New Family of Diode Clamp Multilevel Inverter Ordeal to Induction Motor

Rathinam Angamuthu, Karthikeyan Thangavelu, and Ramani Kannan

***Abstract*—This paper describes the design and implementation of a new diode clamped multilevel inverter for variable frequency drive. The diode clamp multilevel inverter has been widely used for low power, high voltage applications due to its superior performance. However, it has some limitations such as increased number of switching devices and complex PWM control. In this paper, a new topology is proposed. New topology requires only (N-1) switching devices and (N-3) clamping diodes compared to existing topology. A modified APO-PWM control method is used to generate gate pulses for inverter. The proposed inverter topology is coupled with single phase induction motor and its performance is tested by MATLAB simulation. Finally, a prototype model has built and its performance is tested with single phase variable frequency drive.**

***Index Terms*—Multilevel inverter, APO-PWM, induction motor, total harmonic distortion, topology**

I. INTRODUCTION

Multilevel inverters are one of most popular and very attractive low, medium and high voltage converter topologies for industrial drive applications [1]. There are several advantages of this inverter such as reduced voltage stress, allows operation at high voltage, eliminates over voltage control, low EMI problem and reduced switching frequency and switching loss [2, 3]. The limitations of these inverters are a higher number of switching devices, complex design of the gate drives circuit, require isolated voltage sources. In the recent year, these have been increasing more interest in research in development of the new topology of the inverter and its applications. However, the recent inverter topologies are Diode clamped (DC), Flying Capacitor (FC) and cascaded H-Bridge (CHB) converters [4-6].

A few applications of H-bride converters are medium voltage industrial drive, Flexible AC transmission systems. The main drawback of this inverter is provision of an isolated power supply for each individual cell. In capacitor clamping inverter is very attractive for drive applications. However, as the number of level increases, it will be the great challenge for thermal, insulation and low inductance design [7-11]. The NPC has been designed to overcome the above mentioned problems. The NPC converter has been successfully implemented to the integration of renewable energy sources to the utility grid [12], low voltage drives and electrical tractions [13, 14].

Researchers also focused to implement the multilevel inverter in low power applications. The quality of harmonic levels is enhanced by increasing the number of levels. However, it requires a large number of semiconductor switching devices and gate driver circuits, which reducing the inverter reliability, complexity, cost and also the system efficiency. For low power application the utilization of a large number of switching devices is inadequate, therefore, researchers continue to focus on reducing the component count of multilevel inverter [15-25].

The above reported research work has been described many topologies of the inverter. However, still need the

Manuscript received Jul. 15, 2015; accepted Dec. 3, 2015
Department of EEE, Paavai Engineering College, Namakkal, India
E-mail : rathnam2020@gmail.com

Design and Implementation of 11-Level Inverter with Facts Capability Using Modular Multi-Level Converter (MMC) Topology

R. Santhosh Kumar[1] C. Arul Kumar[2]
[1,2]Department of Electrical & Electronics Engineering
[1,2]Paavai Engineering College, Namakkal, India

Abstract— *In this paper presents the scheme of a multi-level inverter with SSSC capability for small to mid-size (10kw-20kw) wind placed by using most progressive modular multi-level converter (MMC) topology. The inverter is fixed between the renewable energy source, especially a wind turbine, and the distribution grid in form to fix the power factor of the grid at a target value, anyway of wind speed, by regulating active and reactive power required by the grid. This paper learning, a SSSC is used to realize the effect of this device in controlling active and reactive power. The proposed multilevel inverters due to compact harmonic distortion, lower electromagnetic interference, and developed dc link voltages. Though, it has some disadvantages such as established number of modules, complex pulse width modulation control technique, and voltage-balancing problems. In a novel topology with a reversing-voltage module is proposed to develop the multilevel performance by compensating the disadvantages mentioned. Thus, the total cost and complexity are significantly reduced particularly for higher output voltage levels. Results show that the reduced-scale 11-level inverter is able to fix PF of the grid as well as being companionable with IEEE standards. Finally, a model of the 11-level proposed topology is complete and tested to display the performance of the inverter by investigational results.*

Keywords— Modular Multi-Level Converter (MMC), Static Synchronous Series Compensator (SSSC), Power Factor (PF).Harmonic Distortion, Real and Reactive Power

I. INTRODUCTION

Fundamentally Inverter is an arrangement that converts DC power to AC power at desired output voltage and frequency. Drawbacks of inverter are less efficiency, high THD, and high switching losses. To overcome these drawbacks, we are going to use multilevel inverter. The duration Multilevel instigated with the three-level converter. The conception of multilevel converters has been announced since 1975. The cascade multilevel inverter was first suggested in 1975, in recent years multilevel inverters are used for high voltage and high power applications [1]. Modular multilevel converters have abundant potential in high power applications, such as dc interconnections, Off-shore, and Dc power grids wind power generation are in must of exact power flow control and high efficiency power conversion in order to reduce both their environmental impact and their operating costs [2]. A rectifier well-found with a maximum power point tracker (MPPT), converts the output power of the wind turbine to a dc power. The dc power is then converted to the preferred ac power for power lines using an inverter and transformer modern growths in wind energy, utilizing smoother wind energy inverters (WEIs) has become an important issue. There are allocations of single-phase lines in the United States, which power small farms or remote houses [3], [4].

Multilevel converters are used for triumphing medium voltage power conversion without transformers. Two of the representatives are: 1) Diode-clamped multilevel converter (DCMC); 2) the flying-capacitor multilevel converter (FCMC). The three-level DCMC or NPC converter has been put into practical use. If a voltage-level number is more than three in the DCMC, inherent voltage difference occurs in the series-connected Dc Capacitors, thus resulting in needing an exterior balancing circuit (such as a buck–boost chopper) for a couples of Dc capacitors [5]. Converters for these applications are commercially offered by a mounting group of companies in the field [6]. This discovers the static synchronous series compensator (SSSC) FACTS controller act in terms of stability improvements. A Static Synchronous Series Compensator (SSSC) is a member of FACTS family which is coupled in series with a power system. It consists of a solid state voltage source converter (VSC) which generates a controllable alternating current voltage at essential frequency. When the injected voltage is kept in quadrature with the line current, it can emulate as inductive or capacitive reactance so as to influence the power flow through the transmission line [7], [8].The switching power converter-based FACTS controllers can carry this out. Among the different alternatives of FACTS devices, Static Synchronous Series Compensator (SSSC) is proposed as the most suitable for the present application. The main function of the SSSC is to dynamically control the power flow over the transmission line [9]. At the same time, rising costs and growing environmental concerns make the process of building new power transmission and distribution lines increasingly complicated and time consuming. The switching power converter-based FACTS controllers can carry this out. Among the different variants of FACTS devices, Static Synchronous Series Compensator (SSSC) is proposed as the most adequate for the present application. The DC inner bus of the SSSC allows incorporating a substantial amount of energy storage in order to enlarge the degrees of freedom of the SSSC device and also to exchange active and reactive power with the utility grid. The applications of the SSSC are 1) To control the power flow, 2) To increase the power transfer limits, 3) To improve the transient stability 4) to damp out power system oscillations 5) to mitigate Sub Synchronous Resonance (SSR) [11].

In this paper, the proposed WEI employs MMC topology, which has been introduced recently for FACTS applications. Replacing conventional inverters with this inverter will eliminate the need to use a separate capacitor bank to fix the PF of the local distribution grids. Clearly, depending on the size of the power system, multiple inverters might be used in order to reach the desired PF. The unique work in this paper is the use of MMC topology for a single phase voltage-source inverter, which meets the IEEE standard 519 requirements, and is able to control the PF of

An Integrated Dynamic Voltage Restorer- Multilevel H-Bridge Inverter for Improving Power Quality of the Distribution Grid

M.Gokulraj[1] M.Raja[2]
[1,2]Department of Electrical & Electronics Engineering
[1,2]Paavai Engineering College, Namakkal, India

Abstract— *In this paper, the problem of voltage sags and swell and it is several impact on sensitive load is well known. To defeat this problem, Dynamic Voltage Restorer (DVR) is a custom power devices Used for mitigating voltage sag and swell in power distribution system. Multilevel H-bridge inverter is used to exchange the real and reactive power to the load from photovoltaic (PV) system. DVR model, PV model, sliding mode controller (SMC) model, neural network and local grids are implemented and the results are shown in the simulation. PV array is directly connected to the DVR with the absent energy storage devices. Neural network controller is used in this system. The proposed system was developed by MATLAB Simulink. The objective of this project is to study the system behavior, which allows the renewable energy sources for mitigating voltage disturbances.*

Keywords— Dynamic Voltage Restorer (DVR), photovoltaic (PV) system, neural network, sliding mode controller (SMC), Multilevel H-bridge inverter

I. INTRODUCTION

The major trouble in power system is voltage sag and engorge, voltage flicker, transient. Dynamic Voltage Restorer (DVR) is a custom power devices Used for mitigating voltage sag and swell in power distribution system [1]. DVR is one of the devices that have a related configuration of series type of FACTS device. The significance of this device is to guard a sensitive load from sag or engorge and deviations in the supply side by quick succession voltage booster to recompense for the fall or grow in the supply voltage. Here we described DVR principles and voltage correction methods for balanced or unbalanced voltages and engorge in a distribution system [9].When there is a distortion in the source voltage, the proposed series device may also have to introduce a distorted voltage to counteract the harmonic voltage

Along with existing control methods of DVR, the SMC technique has its high strength and simplicity. A sliding mode input–output linearization checker for the zero-voltage switching (ZVS) is accessible [5]. The proposed controller broadly improves the transient response and disturbance, dismissal of the converter as preserving the closed-loop stability and SMC utilizes discontinuous control laws to make the system state trajectory onto a specified surface in the state space, so called sliding or switching surface, and to maintain the system state on this assorted for all the subsequent times [1&5].

Photo voltaic systems can create straight current electricity without environmental impact and contamination when exposed to solar radiation [2]. Recently various new methods are proposed for modeling and simulation of photovoltaic arrays (PVA) having higher accuracy and lower assumptions. Being a semiconductor device, the PV system is static, quiet, free of moving parts, and has little operation and maintenance costs. For the effective\ integration of the solar power into the power system, good controlling methods should be developed with power electronics devices [10].

II. DYNAMIC VOLTAGE RESTORER (DVR)

A Dynamic Voltage Restorer (DVR) is newly planned series connected solid state device that injects voltage into the system with the aim of regulate the load side voltage. The DVR was first installed in 1996. It is generally install in distribution system between the supply and critical load feeder. Its primary function is rapidly improving the load-side voltage as it was disturbance in order to avoid any power disruption to that load.

There are various circuit topologies and control schemes with the aim of implement a DVR. In addition to voltage sags and swells compensation, DVR can also added new features such as: line voltage harmonics compensation, reduction of transients in voltage and fault current limitations [9]. The common configuration of the DVR consists of an Injection / Booster transformer, a Voltage Source Converter (VSC), a Harmonic filter, DC charging circuit and a Control and Protection system as shown in Figure 1.

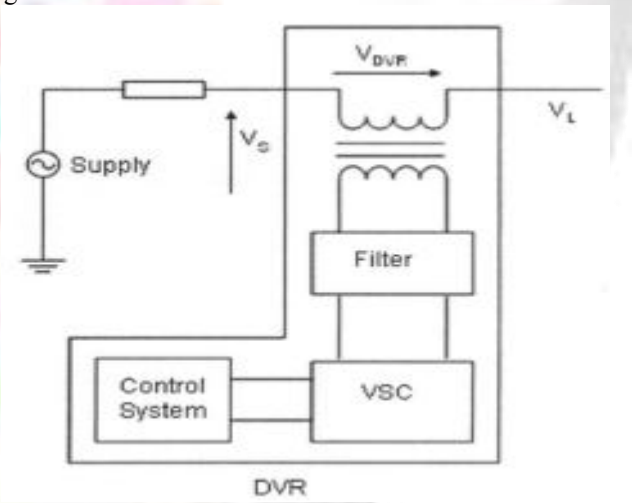

Fig. 1: DVR series connected topology

A. *Operating Principle of DVR:*

The basic role of the DVR is to inject a dynamically controlled voltage VDVR produced by a forced commutated converter in series to the bus voltage by incomes of a booster transformer. The momentary amplitudes of the three injected phase voltages are controlled such as to remove any detrimental effects of a bus fault to the load voltage VL. In that any differential voltages affected by transient disturbances in the ac feeder will be compensated by an equivalent voltage produced by the converter and inserted on the medium voltage level through the booster transformer. The DVR works independently of the type of

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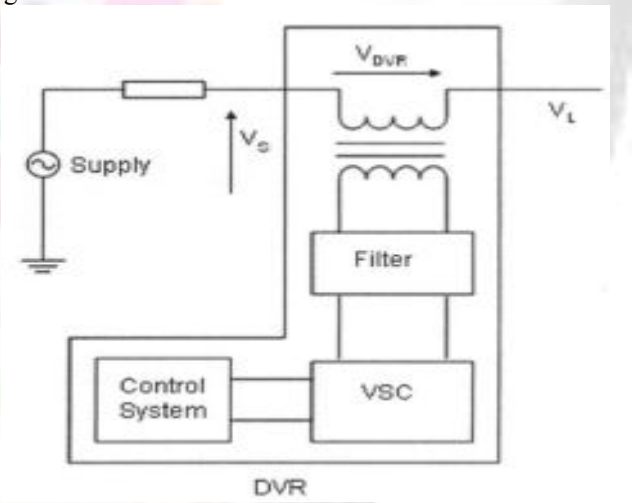

Fig. 1: DVR series connected topology

A. *Operating Principle of DVR:*

The basic role of the DVR is to inject a dynamically controlled voltage VDVR produced by a forced commutated converter in series to the bus voltage by incomes of a booster transformer. The momentary amplitudes of the three injected phase voltages are controlled such as to remove any detrimental effects of a bus fault to the load voltage VL. In that any differential voltages affected by transient disturbances in the ac feeder will be compensated by an equivalent voltage produced by the converter and inserted on the medium voltage level through the booster transformer. The DVR works independently of the type of

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Fault Analysis And Protection For Power Transformer Using Adaptive Differential Relay

S.Jagatha
PG Scholar: Power Systems Engineering
Paavai Engineering College
Namakkal, India
jagathasri@gmail.com

R.Muthukumar
Assistant Professor: Electrical and Electronics Engineering
Paavai Engineering College
Namakkal, India
rathamuthukumar@gmail.com

***Abstract*— this paper presents the fault analysis and differential protection scheme of the three phase power transformers. The relay operates mainly during the internal fault condition and it must be insensitive to any fault outside the zone of protection. In this paper, a fuzzy logic based differential protection schemes has been used. It blocks the tripping during external fault condition or magnetizing inrush current and it trips the relay during internal faults. The simulation result of fuzzy logic based differential relay for three phase power transformer shows the fast tripping during internal fault and also avoids the mal operation of relay during external fault.**

***Keywords*— Circuit Breaker, Differential relay, Fuzzy Logic Controller, Mat Lab, Power Transformer, Transmission Line .**

I. INTRODUCTION

Power transformers (PT) are one of the most important components in a transmission line. So they require proper analysis and protection during faults period to avoid PT damage[1]. For economic and reliable operation of power supply to the consumer need proper protection schemes applied to power systems. It must fast tripping during faults and more reliable which discriminates the internal faults, external faults and other operating condition (like magnetic inrush current, CT saturation[2]). On the other hand, the protection schemes to avoid mal function or false tripping during faults occurred out of the protection zone[3].

Differential protection is based on the fact that any fault within electrical equipment would cause the current entering it to be different, from that leaving it. Thus compare the two currents either in magnitude or in phase or both and issue a trip output if the difference exceeds a predetermined set value. In recent trends technology aimed at improved selectivity, sensitivity, and operation time of differential relays has been presented to overcome the related problems. But they need large data's and operating time is more. In this paper an improved fuzzy logic based differential relay is proposed which is capable of differentiating between magnetizing inrush current, internal faults, external faults and reduced tripping time[4],[5]. Proposed protection scheme is fast and auto reclosing of circuit breaker after the removal of fault. Power system with Fuzzy Based Differential Relay is modeled using MATLAB-SIMULINK.

II. PRINCIPLE OF DIFFERENTIAL RELAY

The operating principle of power transformer differential protection as in shown Figure 1 is based on comparison of the transformer primary and secondary winding currents[6].

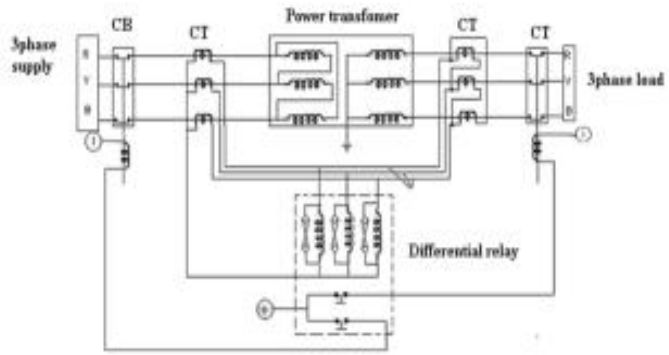


Fig. 1.Block Diagram of Differential Relay

During the normal operating condition, the current I_1 enters the primary winding and I_2 leaves the secondary winding of the transformer must be equal as shown in Figure 2.

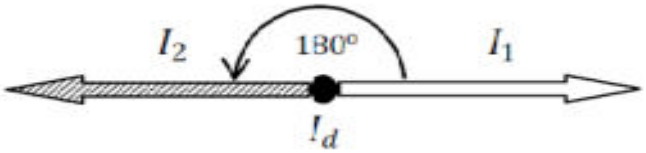
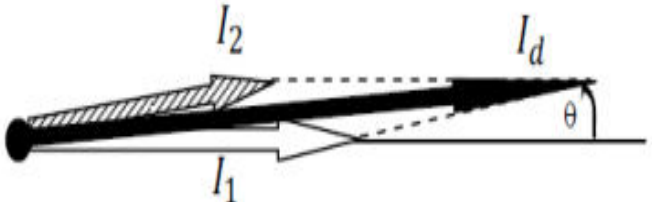


Fig. 2.Output Currents of the CT's Under Normal Conditions

If any unbalances are encountered in between both the currents which are due to the faults, the primary and secondary current are different as shown Figure 3, then the relay will actuate and gives trip signal to circuit breaker of both the primary and secondary side of the transformers[7].



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A Dynamic Performance of Transient Stability Analysis For Power System Network

Suganya A
P.G. Scholar
Department of EEE.
Paavai Engineering College
Namakkal, India
p.a.c.suganya@gmail.com

MuthuKumar R
Department of EEE.
Paavai Engineering College
Namakkal, India
rathamuthukumar@gmail.com

Abstract— The intention is to examine the transient stability of the power system when a symmetrical three phase fault is created at bus by using E-TAP software. Transient stability is the ability of a machine to run at synchronous speed even focused to large disturbances. At this juncture the transient stability analysis is carried out for 6 bus system. The enrichment in stability and the power oscillation is damped out when the fault is cleared within time. The fault is created at bus 4 for 0.3 second and the clear fault time is 0.5 second. If the fault is not cleared within the time the generator losses its synchronism that is the generator goes out of step and produces power oscillations in the output. In order to diminish the power oscillations and bring the system again to stable critical clearing time is used. After the fault is cleared the power oscillations are damped and the generator runs in step.

Keywords— Critical clearing time; E-TAP software; Steady state stability; Three phase fault; Transient stability

Introduction

The power system stability is the ability of a synchronous machine to remain in synchronism even subjected to some disturbances. The power system stability are classified as

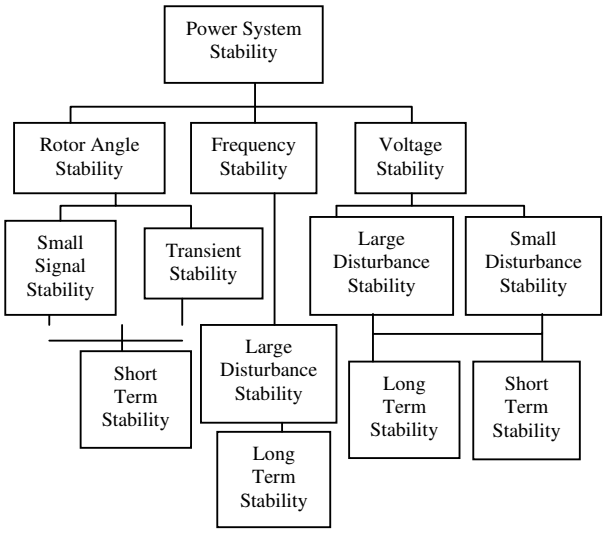

Fig. 1. Classification of Power System Stability

Rotor Angle Stability

Rotor angle stability is the ability of inter connected synchronous machine to remain in synchronism. The problem of stability involves study of electromechanical oscillations. It depends on ability to maintain or restore equilibrium between electromagnetic torque and mechanical torque of each synchronous machine. Rotor angle stability is classified as

Steady state stability
Transient stability

Frequency Stability

Frequency stability is the ability of power system to maintain to maintain steady frequency within the nominal range.

Voltage stability

It is the ability of a power system to maintain steady voltages at all buses in the system even subjected to disturbances.

The stability is influenced by the dynamics of generator rotor angle and power angle relationship. The transients are caused due to sudden addition or rejection of loads, short circuit, switching operations. Instability of a system means loss of synchronism or falling out of step. That is the generator oscillation goes beyond 180 degree, the machine losses its synchronism therefore 180 degree is the standard transient stability limit. If the generator oscillates outside the limit the system will not be operated in stable operating condition. In order to make the system to be stable critical clearing time is used. The critical clearing time is the maximum allowable time for clearing the fault. However critical clearing time is not adequate decisive factor to assess the transient stability when severe fault occurred in the power system. The oscillation of generator is measured with infinite bus or grid which is represented as slack bus. As rotor oscillates the synchronous machine power output varies. It depends on the ability to maintain equilibrium between electromagnetic torque and mechanical torque of each synchronous machine in the system.

Under steady state condition there is a balance between the input mechanical torque and output electrical torque of each machine and speed does not change. When synchronous machine losses synchronisms with the rest of the system the rotor runs at higher or lower speed. The system is designed to operate with set of conditions. The conditions considered are short circuits types, phase to ground, phase to phase to ground or three phase fault. They are assumed to occur on transmission lines but sometimes on bus or transformer. The faults can be cleared by opening of circuit breaker to isolate the faulted element. The high speed reclosure may also be

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HIGH TEMPERATURE OXIDATION AND HOT CORROSION BEHAVIOUR OF PLASMA SPRAYED YSZ COATING ON SA213 T92 STEEL IN AIR AND SALT AT 900°C UNDER CYCLIC CONDITION

M. Makesh[1], P. Palanisamy[2] and K. Devakumaran[3]
[1]Paavai Engineering College, Namakkal, India
[2]AMS Engineering College, Namakkal, India
[3]Welding Research Institute, BHEL Trichy, India
E-Mail: makesh3375@gmail.com

ABSTRACT

Oxidation and hot corrosion has been considered as the principal destructive factors in thermal barrier coating systems during service. Thermal barrier coatings (TBCs) are extensively used to protect turbine blades against high temperature oxidation and corrosion. At the present time, problems of component materials reliability in power plant focus on assessing the potential behavior of coatings, in order to avoid expensive failure in service. Hot corrosion studies were conducted on both coated and uncoated specimen in air and salt (Na_2SO_4–60% V_2O_5) at 900°C under cyclic conditions for 50 cycles. An each cycle of one hour heating at 900°C followed by 20 minutes of cooling in air. Yttria-Stabilised Zirconia (YSZ) coatings were deposited on T-92 boiler steel weldments. In this paper present a comparison on the experimental performance of YSZ coating has been made to understand their hot corrosion behavior. This YSZ coatings increase the resistance to corrosion substantially which can be attributed to formation of zirconium oxides (ZrO_2) and yttrium oxide ($Y2O_3$). This coating was more significant in salt environment and there is an additional phase of ZrS. Thermo-gravimetric technique was used to establish oxidation kinetics and X-Ray Diffraction (XRD) and scanning electron microscopy/Energy Dispersive Spectrometry (SEM/EDS) techniques were used to characterize the oxide scales.

Keywords: hot corrosion, yttria-stabilised zirconia, thermal barrier coating.

1. INTRODUCTION

Hot corrosion can be regarded as an accelerated oxidation attack of metals exposed to the flow of combustion gases. Metals and alloy reacts during high temperature service with the surrounding environment, resulting in high temperature corrosion.

Oxidation is the most important high temperature reaction. Oxidation of metals or alloys takes place when they are heated in a highly oxidizing atmosphere such as air or oxygen. An oxidation reaction is represented by the interaction of metals with oxygen to form oxide. There are a variety of factors on which the oxidation behaviors of a metal depends and the reaction mechanism involved may often be quite complex. An oxidation reaction begins with adsorption of oxygen molecules from the atmosphere, nucleation of oxides, formation of a thin oxidation layer, followed by its growth to a thicker scale [1].

In a wide variety of applications, mechanical components have to operate under severe conditions, such as high load, speed or temperature and hostile chemical environment. Thus, their surface modification is necessary in order to protect them against various types of degradation.

Thermal barrier coating (TBC) systems are used in thermal insulating components in the hot sections of gas turbines in order to increase operational temperature with better efficiency [2-8]. Yttria stabilized zirconia (YSZ) has been usually chosen for the top insulating coat material because of its high thermal expansion coefficient, which closely matches that of the substrate. Apart from this application TBC is also useful in aerospace, aircraft and boiler applications.

The different functions of the coating, such as wear and corrosion resistance, thermal or electrical insulation can be achieved using different coating techniques and coating materials. The purpose of a hot corrosion resistant coating is to serve as an effective solid-state diffusion barrier between oxygen (or other gases) and base metal [9]. Mostly metals and alloys experience accelerated oxidation when their surfaces are covered with a thin film of fused salt in an oxidizing gas atmosphere at elevated temperatures. This is known as hot corrosion where a porous non-protective oxide scale is formed at the surfaces and sulphides in the substrate [10].

The research work deals with development of NiCrAlY as bond coat and YSZ as top coat on T-92 boiler steel weldments along with their characterizations. X-ray diffraction (XRD) and scanning electron microscopy/energy-dispersive analysis (SEM/EDAX) techniques have been used to characterize coating and respective corrosion products after hot corrosion at 900°C.

2. RESEARCH SIGNIFICANCE

Material evolution over the last few decades has make progress for large thermal power plants to be built today with steam temperatures of 900°C and supercritical steam pressures. In recent years, the construction of advanced ultra-supercritical fossil-fired power generation plant with higher efficiency has been accelerated by the

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Micro-ECM drilling of Copper Alloy and Taguchi Optimization

Subburam Venkatajalapathy[1,a*], Ramesh Sengottuvelu[2,b]

[1]Department of Mechanical Engineering, Paavai Engineering College, Namakkal-637018, India

[2]Department of Mechanical Engineering, Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai-600062, India

[a] v_subburam@yahoo.com, [b] ramesh_1968in@yahoo.com

Keywords: Electrochemical Micromachining, Copper Alloy, $NaNO_3$, Taguchi Analysis, S/N ratio, ANOVA.

Abstract. The aim of this work is to produce micro-holes on a Copper alloy specimen by using electrochemical micromachining (EMM) technique and investigate the outcomes to study the effect of parameters on the process and parameter optimization. An EMM system with pulse generator, developed for research purpose is used to carry out the experiments. The parameters considered as dominant inputs and performance indicators were selected for study on the basis of literature review. Machining voltage, Pulse on-time and Electrolyte Concentration are the input parameters considered and performance parameters taken for analysis are Material Removal Rate (MRR) and overcut. The experimental design and parameter optimization were done utilizing Taguchi's L9 orthogonal array (OA). From the experimental results it could be observed that speeding up the machining process affects the accuracy and also there are other indirect factors which have significant control over the process.

Introduction

Micro Electrochemical machining which is commonly referred to as EMM (Electrochemical Micromachining) is an ionic dissolution process with many inbuilt advantages that makes it a suitable process for the micro-fabrication domain[1]. The limitations of the process are that it can be applied only for electrically conducting materials and machining takes place slowly. The process control factors for EMM, both direct and indirect are many and varied. The innumerable variations that can be effected in the machining conditions of this process make it a difficult process to obtain desired results. That provides a lot of scope for research in the area of EMM as every specific set of machining condition is to be optimized to achieve efficiency and accuracy [1,3].

Kock et al [2] showed that precision of electrochemical micromachining can be improved to nanometer accuracy by applying ultra short voltage pulses. Bhattacharyya et. al [3] developed EMM setup and conducted performance study by drilling micro holes on copper sheet for parameter optimization. Zhaoyang Zhang et al [4] carried out experimental investigation with ultra short voltage pulses and also developing theoretical model on electrochemical micromachining process and showed that shape accuracy can be improved by lower voltage amplitude and shorter pulse-on time. Investigations of employing microsecond voltage pulses in EMM for localisation of machining have shown that electrolyte temperature increases during pulse time. This determines the dissolution rate and increase in the electrolyte conductivity between the electrode gap [5]. Thanigaivelan et.al used tool electrode tips of different shapes like flat, conical, rounded cone and truncated cone to machine SS-304 specimen through EMM process and found that overcut was reduced by conical and rounded tip tools whereas machining rate was reduced by truncated cone tip tool [6]. The process characteristics of EMM process are significantly affected by the nature of electrolyte used. Acidified electrolytes have been used for EMM process to investigate their influence and found to give higher machining rate and lesser accuracy [7]. Malapathy investigated the role of predominant process parameters of EMM and identified pulse period and duty ratio as the effective parameters[8]. In manufacturing industry hole is a basic feature required for

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Experimental Study on Energy Recovery from Condenser Unit of Small Capacity Domestic Refrigerator

[1]P. Elumalai, [2]R. Vijayan, [1]K.K. Ramasamy and [1]M. Premkumar

[1]Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India
[2]Department of Mechanical Engineering, Government College of Engineering, Salem, Tamilnadu, India

Abstract: This paper presents an investigation on heat recovery from the condenser of the Vapour Compression Refrigeration (VCR) system through hot oven and heater which is placed between the compressor and condenser components. The presence of oven makes it possible to recover the superheat of the discharge vapour and utilize it for increasing the temperature of the space inside the hot oven and increase the temperature of the water in the heater chamber. Temperature of the juice in the juice cooler chamber is also reduced by pumping the juice in a separate heat exchanger tube attached with the evaporator tube and the cooled juice is stored in the juice cooler chamber. The effectiveness of the cooler with varying working time has been studied. The effect of operating temperature in the oven and heater for varying operating time of a refrigeration system have all been studied and feasible heat recovery have been ascertained. The parametric result obtained for varying working hours have also been presented.

Key words: Waste heat recovery · Vapour compression refrigeration system · Hot oven · Water heater · Juice Cooler

INTRODUCTION

Energy saving is one of the key issues not only from the view of energy conservation but also for the aegis of global environment. Energy conservation is now faced with the challenge of applying the latest technology for facilities and improvements that can be justified on its own merits. In the present world energy spectrum and energy management plays an important role. Energy conservation is the technique to be adopted to face the energy crisis under these circumstances. Waste heat is the heat, which is generated in a process by the way of fuel combustion or chemical reaction and then "dumped" into the environment even though it could still be utilized for some useful and economic purposes. Waste heat, in most general sense, is the energy associated with the waste streams of air, gases and liquids that leave the boundaries of a plant or building and enter into the environment. Waste heat which is rejected from a process at a temperature high enough above the ambient temperature permits the recovery of energy for some useful purposes in an economic manner.

By experimenting with waste heat recovery system in refrigeration unit, Kaushik et al have found that in general, 40% of condenser heat can be recovered through the Canopus heat exchanger for a typical set of operating conditions [1, 2]. Sathiamurthi P et al discussed in his studies on waste heat recovery from an air conditioning unit that the energy can be recovered and utilized without sacrificing comfort level and also he has designed and developed the waste heat recovery system for air conditioning unit [3, 4]. Rahman et al investigated on the waste heat recovery equipment from split air conditioner unit. In their research, the condenser unit was replaced by a copper tube, which was sunken in a water tank in order to get warm up the water which could be used for domestic purposes. The results have shown that the temperature of the water in the tank can be increased from 25°C to 42°C and subsequently, evaporator temperature can be denied from 27°C to 18°C within 7 minutes [5]. Stalin, et al carried out the usage of waste heat from air-conditioners efficiently. The work engrossed on hot water for several applications using heat renounced by the air-conditioner system [6]. Abu-Mulaweh et al discussed that

Corresponding Author: P. Elumalai, Department of Mechanical Engineering,
Paavai Engineering College, Namakkal, Tamilnadu, India.

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Mechanical Performance of Coir and Glass Fibre Reinforced Hybrid composite materials for Automotive Brake Pad

P.Parandaman[a*], Dr.M.Jayaraman[b], Dr.K.K.Ramasamy[c], Dr.M.Premkumar[d]

[a*]Associate Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India.

[b] Professor, Department of Mechanical Engineering, Velalar College of Engineering & Technology, Erode, T.N, India.

[cd] Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India.

E-mail: parandu@gmail.com

Abstract: The main objective is to enhance the mechanical properties of brake pad by using coir and glass fibre composite material. Coir fibre is the one of the modern research natural fibre and the glass fibre is used for improving the strength and heat resistance. In this research work to develop new composite material for automotive brake pad application. Since the existing braking pads have asbestos, non asbestos which causes the environmental pollution and wear frequently. The braking system and brake pads are important safety devices in vehicles. The coir and glass fibre is mixed with filler material, and then the mixture is compacted at a pressure by using hand-press machine. Further compacting and curing using a hot press at high temperature with different processing pressures are performed in compression moulding machine. The testing was taken such as tensile, flexural, impact and wear test. They were examined and the anticipated results are plotted in this exploration.

Keywords--- Coir, Glass fibre, tensile strength, flexural strength, impact, wear, automotive brake pad.

1. INTRODUCTION

The braking system is composed of many parts as shown figure 1. Including brake pads on each wheel, a master cylinder, wheel cylinders, and a hydraulic control system. Different types of brake materials are used in different braking systems. They are often categorized into four classes of ingredients: binders, fillers, friction modifiers, and reinforcements. The brake pads generally consist of asbestos fibres embedded in polymeric matrix along with several other ingredients. Over the few years, several research works have been carried out in the area of development of asbestos-free brake pads.

The use of bagasse (Aigbodian et al., 2010), palm kernel shell (Dagwa and Ibhadode, 2006) and palm oil clinker (Zamri et al., 2011) have been investigated in order to replace the asbestos-free brake pad material. Current trend in the research field is to utilization of industrial or agricultural wastes as a source of raw materials for composite development (Leman et al., 2008). This will provide more economical benefit and also environmental preservation by utilize the waste of natural fibre. Moreover, many factors should be considered to develop brake materials as to fulfil the requirement such as, a stable friction coefficient and a lower wear rate at various operating speeds, pressures, temperatures, and environmental conditions in the automotive sectors (Wannik et al., 2012; Adebisi et al., 2011).

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Mechanical Performance of Coir and Glass Fibre Reinforced Hybrid composite materials for Automotive Brake Pad

P.Parandaman[a*], Dr.M.Jayaraman[b], Dr.K.K.Ramasamy[c], Dr.M.Premkumar[d]

[a*]Associate Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India.

[b] Professor, Department of Mechanical Engineering, Velalar College of Engineering & Technology, Erode, T.N, India.

[cd] Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India.

E-mail: parandu@gmail.com

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Comparative Study of Neutral and Acidified Electrolytes for Micro-ECM Process Parameters

Subburam.V[1]., Ramesh.S[2]., Karthikeyan.S[3]., Meiyazhagan.R[3].

[1]Associate Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal.
email: v_subburam@yahoo.com
[2]Professor, Department of Mechanical Engineering, Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai.
[3]Assistant Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal.

Abstract *-- Unconventional machining techniques are preferred by industries in the micro-manufacturing domain. Electrochemical Micromachining (Micro-ECM), a non-conventional method finds wide application in many industries for generating micro-features to make use of its inherent advantages. But controlling the process is a difficult task as it is a complex one with a variety of variable inputs influencing the performance. The influence of electrolyte on the performance of electrochemical micromachining process is a major factor as its characteristics like concentration, flow dynamics, temperature, throwing power and sludge formation have great influence on the process. The objective of this paper is to conduct experiments to investigate and compare the influence of neutral and acidified electrolytes on Material Removal Rate and shape accuracy. Micro-holes were generated on Stainless Steel-304 work-plate using stainless steel tool electrode. Influence of neutral salt electrolyte ($NaNO_3$) and acidified electrolyte ($NaNO_3$ + HCl) on process parameters like applied voltage, current, pulse ON/OFF time and electrolyte concentration are studied and compared by carrying out experiments. It is observed that acidified electrolyte enhances machining rate whereas the neutral electrolyte is suitable to achieve lower overcut.*

Keywords -- Micro-ECM ; Micro-hole; Machining rate; Overcut; Acidified Sodium Nitrate

I. INTRODUCTION

The advent of miniaturized electronic components have changed the world rapidly. Miniaturization is the trend in electronic, medical, chemical, automobile fields and other industries are also coming under micromachining domain now. Non-traditional machining techniques are generally preferred for micromachining as they require less force which can be achieved through thermal, electrical or chemical energies individually or in combination for micro-level material removal. Many unconventional machining techniques are under research to study their micromachining potential, advantages limitations and refine them to adopt for micro-manufacturing.

Bhattacharyya et al [1-3] have conducted experiments in indigenously developed electrochemical micromachining setup to study the potential of the process and the influence of various input parameters. It has been reported that with further research for proper controlling of the process parameters, it can be developed as the most effective micromachining technology for the future considering its fundamental advantages over other methods.

Wansheng Zhao et al [4] have designed a setup along with high frequency pulse power supply system to conduct electrochemical machining experiments at micro to meso-scale. It was reported that with low machining voltage, high frequency, short pulse current, low electrolyte passivity concentration and reducing inter-electrode gap up to 10µm, better shape accuracy and material removal rate can be achieved.

Bao Huaiqian et al [5] have developed a technique called electrochemical micromachining in pure water (PW-ECM), an environment friendly micromachining for use in aerospace industry. The drawbacks in this process like short circuit and sparks were overcome by devising a combined machining process of PW-ECM assisted by ultrasonic vibration (PW-ECM/USV). Square cavities, holes and English alphabets were generated on stainless steel plate using this process.

Van Tijum et al [6] have explained the complexities of the various interactions involved in the electrochemical process by conducting laboratory experiments, designing numerical models and also developing Multiphysics simulation models for validation.

Chan Hee Jo et al [7] experimented to generate internal features through electrochemical micromachining. Reverse tapered and barrel shaped holes were fabricated by effecting variations in process parameters. Insulation of electrode walls for avoiding over-dissolution of work material during processing was also reported.

Shi Hyoung Ryu [8] has used citric acid electrolyte, considered safe and eco-friendly to drill micro holes on Stainless Steel 304 work piece through electrochemical process. It has been reported that Citric acid can be utilized as electrolyte for industrial and commercial applications.

Sharma et al [9] have used acidified Sodium Chloride as electrolyte for electrochemical machining. Unlike normal salt electrolytes which produce large amount of sledges and clog the flow by contaminating the electrolyte, acidified electrolyte provides less contaminated flow.

Mithu [10] has utilized dilute hydrochloric acid to drill micro-holes and studied its effects on the process. Acidified medium produced lesser amount of by-

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Micro-drilling of Metal-Ceramic Composite through Electrochemical Micromachining

V. Subburam[1], S. Ramesh[2] , S.Karthikeyan[3], T.Kalaiselvan[4]

[1]Associate Professor, Department of Mechanical Engineering,Paavai Engineering College, Namakkal-637018, India
[2]Professor, Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai-600062, India
[3]PAssistant Professor, Department of Mechanical Engineering,Paavai Engineering College, Namakkal-637018,India
[4]PG Scholar, Department of Mechanical Engineering,Paavai Engineering College, Namakkal-637018, India

Abstract—**Non-traditional machining techniques that employ other than mechanical forces are widely in use in the micro-manufacturing domain to machine materials that are difficult to machine in the conventional processes. Electrochemical micromachining (EMM) is a leading unconventional technique based on the principle of electrolysis. EMM process is being researched continuously for its capability to machine a variety of conducting materials such as metals, alloys and composites. The present work involves experimental investigation of EMM process to generate micro-holes on a metal-ceramic composite specimen containing Aluminium and Titanium Carbide. A desk-top EMM setup along with a pulse generator was used to conduct experiments. The influence of input parameters like machining voltage, current, pulse on-time, electrolyte concentration and frequency on Material Removal Rate (MRR) and Overcut were analysed to study the process performance. The experimental results show that presence of ceramic particles in the specimen produces poor shape accuracy.**

Keywords—EMM; $NaNO_3$; Al-TiC composite; Material Removal Rate; Overcut

I. INTRODUCTION

The influence of electronics in every field has made the usage of micro components unavoidable in almost all the fields as compact products with increased functional utility is the trend today. The potential of EMM process in the micro domain is being gradually unraveled by research works to increase its applicability in all the manufacturing industries. Datta et al. have discussed the fundamental aspects of electrochemical micromachining like working principle, unique advantages of the process along with its applications in electronics industry [1]. Bhattacharyya et al. have developed an EMM experimental setup to investigate the influence of predominant process parameters like machining voltage, electrolyte concentration, current, duty cycle, frequency on output parameters like material removal rate and dimensional accuracy and also found out effective range for input parameters applied in the experiments [2]. Zhang et al. designed and fabricated an electrochemical micromachining setup and conducted experiments to study the machining capability of Ni specimen through it. The parameter optimization of machining voltage, duty cycle and electrolyte concentration obtained from the experiments were used to attempt three dimensional micromachining. [3].

Kozak et al. investigated the detail transfer in this process from the cathodic tool electrode onto the anode work surface and studied the electrochemical copying of micro features. Application of ultra-short pulse current and ultra-small electrode gap were recommended for improving the capability of micro-ECM processes [4]. Liu Yong et al. successfully developed an EMM system, conducted experiments to find the predominant process parameters which then were applied to machine a complex microstructure [5]. Electrolytes are chosen to suit the dissolution of work material and different types of electrolytes have been tried to investigate their influence on the process. Acidified electrolytes have also been used to investigate their influence on the performance of the EMM process [6]. The absence of thermal stresses and mechanical stresses in the EMM process was successfully utilized to fabricate micro structures on NiTi Shape Memory Alloy by Joseph et al.[7]. Ramarao et al. investigated the dissolution rate of Al-B_4C composite in EMM machining by studying the effect of process variables [8]. The application of composite materials today pervade all industries and necessitates to explore different techniques to fabricate them into required shapes and sizes. The present study analyses the micro-machinability of Al-TiC composite through electrochemical micromachining process.

II. EXPERIMENTAL PREPARATION

A. Experimental System

The experiments were carried out in an EMM system developed for research purposes. The experimental system is a single axis setup comprising all the required components and controls like tool feed system, stepper motor,machining chamber, work holding device,electrolyte pump, electrolyte filter, pulse generator, electronic gap control kit.

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The major factors involved in the experimentation and their description are given below in table I.

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Mechanical Performance of Coir and Glass Fibre Reinforced Hybrid composite materials for Automotive Brake Pad

P.Parandaman[a*], Dr.M.Jayaraman[b], Dr.K.K.Ramasamy[c], Dr.M.Premkumar[d]

[a*]Associate Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India.

[b] Professor, Department of Mechanical Engineering, Velalar College of Engineering & Technology, Erode, T.N, India.

[cd] Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India.

E-mail: parandu@gmail.com

Abstract: The main objective is to enhance the mechanical properties of brake pad by using coir and glass fibre composite material. Coir fibre is the one of the modern research natural fibre and the glass fibre is used for improving the strength and heat resistance. In this research work to develop new composite material for automotive brake pad application. Since the existing braking pads have asbestos, non asbestos which causes the environmental pollution and wear frequently. The braking system and brake pads are important safety devices in vehicles. The coir and glass fibre is mixed with filler material, and then the mixture is compacted at a pressure by using hand-press machine. Further compacting and curing using a hot press at high temperature with different processing pressures are performed in compression moulding machine. The testing was taken such as tensile, flexural, impact and wear test. They were examined and the anticipated results are plotted in this exploration.

Keywords--- Coir, Glass fibre, tensile strength, flexural strength, impact, wear, automotive brake pad.

1. INTRODUCTION

The braking system is composed of many parts as shown figure 1. Including brake pads on each wheel, a master cylinder, wheel cylinders, and a hydraulic control system. Different types of brake materials are used in different braking systems. They are often categorized into four classes of ingredients: binders, fillers, friction modifiers, and reinforcements. The brake pads generally consist of asbestos fibres embedded in polymeric matrix along with several other ingredients. Over the few years, several research works have been carried out in the area of development of asbestos-free brake pads.

The use of bagasse (Aigbodian et al., 2010), palm kernel shell (Dagwa and Ibhadode, 2006) and palm oil clinker (Zamri et al., 2011) have been investigated in order to replace the asbestos-free brake pad material. Current trend in the research field is to utilization of industrial or agricultural wastes as a source of raw materials for composite development (Leman et al., 2008). This will provide more economical benefit and also environmental preservation by utilize the waste of natural fibre. Moreover, many factors should be considered to develop brake materials as to fulfil the requirement such as, a stable friction coefficient and a lower wear rate at various operating speeds, pressures, temperatures, and environmental conditions in the automotive sectors (Wannik et al., 2012; Adebisi et al., 2011).

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Experimental Investigation on the Mechanical Properties of Jute/Sisal/Glass and Jute/Banana/Glass Hybrid Composite Materials

[1]P. Parandaman and [2]M. Jayaraman

[1]Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamil Nadu, India
[2]Department of Mechanical Engineering,
Velalar College of Engineering and Technology, Erode, Tamil Nadu, India

Abstract: This present work investigates the hybridization of glass fibers with natural fibers for the applications of structural, aerospace and automobile industry. Composites made of natural fibers are of low cost, light weight and user friendly but lower in strength when compared to synthetic fibers. Hence, the natural fiber and synthetic fiber composition need to be optimized for utilization as High Strength (HS) hybrid composite materials for many applications. In this research work two hybrid composites have been developed using Glass, Jute, Sisal and Banana fibers in the form of laminates, namely Jute-Sisal- Glass (JSG) and Jute- Banana-Glass (JBG) combinations. The fabricated test samples have been subjected to tensile, flexural and impact tests to evaluate their mechanical properties. The microstructures of the tested specimens have been performed through Scanning Electron Microscope (SEM) for fracture mode analysis. The comparison of the results shows that the high strength hybrid composite made of Jute-Banana-Glass (JBG) provides better mechanical properties and it could be used for a wide range of applications.

Key words: Glass fibers • Hybrid composites • JSG • JBG • Mechanical Properties • Scanning Electron Microscopy

INTRODUCTION

Natural fibers are derived from plants, animals and mineral sources. In modern days, the natural fibers from plants like sisal, banana and jute mixed with the glass fiber are used to get high strength (HS) hybrid composite materials which are widely used in many applications. HS composite materials are replacing the metallic materials when used in the aerospace, structural and automobile industries. The properties of natural fibers depend mainly on the nature of the plant, location where the plant grows, age of the plant and the extraction methods used. In general sisal fibers, banana fibers and jute fibers are easily available have good mechanical properties like low density, flexibility, high impact resistance (toughness), renewability and also biodegradability [1-9].

The glass fiber composites in recent years have moved towards developing materials with high physical and mechanical characteristics and the focus is to create heat-resistant composites. Glass fibers are made by silicon-di-oxide with the addition of other oxides in some small percentages. It is strong, stiff and temperature resistant and is used as reinforcing materials in many sectors like automotive industries, naval industries and sports equipments. They are produced by spinning process in which the glass fibers are pulled out through a nozzle from molten glass [10-14].

Soma Dalbehera and Acharya [15] experimentally investigated the effect of stacking sequence on tensile, flexural and inter laminar shear properties of untreated woven jute and glass fabric reinforced epoxy hybrid composite. The results showed the properties of Jute - E glass - epoxy and its composites to have considerably improved by the incorporation of glass fiber as extreme glass piles. Hemachandra reddy *et al.* [16] evaluated mechanical properties such as tensile and flexural properties of hybrid glass fiber–sisal/jute reinforced epoxy composites. It was observed that the incorporation of sisal fiber with Glass Fiber Reinforced Polymers (GFRP) exhibited superior performance rather than the jute fiber

Corresponding Author: M. Jayaraman, Department of Mechanical Engineering, Velalar College of Engineering and Technology, Erode, Tamil Nadu, India.

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Experimental Study on Energy Recovery from Condenser Unit of Small Capacity Domestic Refrigerator

[1]P. Elumalai, [2]R. Vijayan, [1]K.K. Ramasamy and [1]M. Premkumar

[1]Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India
[2]Department of Mechanical Engineering, Government College of Engineering, Salem, Tamilnadu, India

Abstract: This paper presents an investigation on heat recovery from the condenser of the Vapour Compression Refrigeration (VCR) system through hot oven and heater which is placed between the compressor and condenser components. The presence of oven makes it possible to recover the superheat of the discharge vapour and utilize it for increasing the temperature of the space inside the hot oven and increase the temperature of the water in the heater chamber. Temperature of the juice in the juice cooler chamber is also reduced by pumping the juice in a separate heat exchanger tube attached with the evaporator tube and the cooled juice is stored in the juice cooler chamber. The effectiveness of the cooler with varying working time has been studied. The effect of operating temperature in the oven and heater for varying operating time of a refrigeration system have all been studied and feasible heat recovery have been ascertained. The parametric result obtained for varying working hours have also been presented.

Key words: Waste heat recovery · Vapour compression refrigeration system · Hot oven · Water heater · Juice Cooler

INTRODUCTION

Energy saving is one of the key issues not only from the view of energy conservation but also for the aegis of global environment. Energy conservation is now faced with the challenge of applying the latest technology for facilities and improvements that can be justified on its own merits. In the present world energy spectrum and energy management plays an important role. Energy conservation is the technique to be adopted to face the energy crisis under these circumstances. Waste heat is the heat, which is generated in a process by the way of fuel combustion or chemical reaction and then "dumped" into the environment even though it could still be utilized for some useful and economic purposes. Waste heat, in most general sense, is the energy associated with the waste streams of air, gases and liquids that leave the boundaries of a plant or building and enter into the environment. Waste heat which is rejected from a process at a temperature high enough above the ambient temperature permits the recovery of energy for some useful purposes in an economic manner.

By experimenting with waste heat recovery system in refrigeration unit, Kaushik et al have found that in general, 40% of condenser heat can be recovered through the Canopus heat exchanger for a typical set of operating conditions [1, 2]. Sathiamurthi P et al discussed in his studies on waste heat recovery from an air conditioning unit that the energy can be recovered and utilized without sacrificing comfort level and also he has designed and developed the waste heat recovery system for air conditioning unit [3, 4]. Rahman et al investigated on the waste heat recovery equipment from split air conditioner unit. In their research, the condenser unit was replaced by a copper tube, which was sunken in a water tank in order to get warm up the water which could be used for domestic purposes. The results have shown that the temperature of the water in the tank can be increased from 25°C to 42°C and subsequently, evaporator temperature can be denied from 27°C to 18°C within 7 minutes [5]. Stalin, et al carried out the usage of waste heat from air-conditioners efficiently. The work engrossed on hot water for several applications using heat renounced by the air-conditioner system [6]. Abu-Mulaweh et al discussed that

Corresponding Author: P. Elumalai, Department of Mechanical Engineering,
Paavai Engineering College, Namakkal, Tamilnadu, India.

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Comparative Study of Neutral and Acidified Electrolytes for Micro-ECM Process Parameters

Subburam.V[1]., Ramesh.S[2]., Karthikeyan.S[3]., Meiyazhagan.R[3].

[1]Associate Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal.
email: v_subburam@yahoo.com
[2]Professor, Department of Mechanical Engineering, Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai.
[3]Assistant Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal.

Abstract *-- Unconventional machining techniques are preferred by industries in the micro-manufacturing domain. Electrochemical Micromachining (Micro-ECM), a non-conventional method finds wide application in many industries for generating micro-features to make use of its inherent advantages. But controlling the process is a difficult task as it is a complex one with a variety of variable inputs influencing the performance. The influence of electrolyte on the performance of electrochemical micromachining process is a major factor as its characteristics like concentration, flow dynamics, temperature, throwing power and sludge formation have great influence on the process. The objective of this paper is to conduct experiments to investigate and compare the influence of neutral and acidified electrolytes on Material Removal Rate and shape accuracy. Micro-holes were generated on Stainless Steel-304 work-plate using stainless steel tool electrode. Influence of neutral salt electrolyte ($NaNO_3$) and acidified electrolyte ($NaNO_3$ + HCl) on process parameters like applied voltage, current, pulse ON/OFF time and electrolyte concentration are studied and compared by carrying out experiments. It is observed that acidified electrolyte enhances machining rate whereas the neutral electrolyte is suitable to achieve lower overcut.*

Keywords -- Micro-ECM ; Micro-hole; Machining rate; Overcut; Acidified Sodium Nitrate

I. INTRODUCTION

The advent of miniaturized electronic components have changed the world rapidly. Miniaturization is the trend in electronic, medical, chemical, automobile fields and other industries are also coming under micromachining domain now. Non-traditional machining techniques are generally preferred for micromachining as they require less force which can be achieved through thermal, electrical or chemical energies individually or in combination for micro-level material removal. Many unconventional machining techniques are under research to study their micromachining potential, advantages limitations and refine them to adopt for micro-manufacturing.

Bhattacharyya et al [1-3] have conducted experiments in indigenously developed electrochemical micromachining setup to study the potential of the process and the influence of various input parameters. It has been reported that with further research for proper controlling of the process parameters, it can be developed as the most effective micromachining technology for the future considering its fundamental advantages over other methods.

Wansheng Zhao et al [4] have designed a setup along with high frequency pulse power supply system to conduct electrochemical machining experiments at micro to meso-scale. It was reported that with low machining voltage, high frequency, short pulse current, low electrolyte passivity concentration and reducing inter-electrode gap up to 10µm, better shape accuracy and material removal rate can be achieved.

Bao Huaiqian et al [5] have developed a technique called electrochemical micromachining in pure water (PW-ECM), an environment friendly micromachining for use in aerospace industry. The drawbacks in this process like short circuit and sparks were overcome by devising a combined machining process of PW-ECM assisted by ultrasonic vibration (PW-ECM/USV). Square cavities, holes and English alphabets were generated on stainless steel plate using this process.

Van Tijum et al [6] have explained the complexities of the various interactions involved in the electrochemical process by conducting laboratory experiments, designing numerical models and also developing Multiphysics simulation models for validation.

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Shi Hyoung Ryu [8] has used citric acid electrolyte, considered safe and eco-friendly to drill micro holes on Stainless Steel 304 work piece through electrochemical process. It has been reported that Citric acid can be utilized as electrolyte for industrial and commercial applications.

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Mithu [10] has utilized dilute hydrochloric acid to drill micro-holes and studied its effects on the process. Acidified medium produced lesser amount of by-

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Micro-drilling of Metal-Ceramic Composite through Electrochemical Micromachining

V. Subburam[1], S. Ramesh[2] , S.Karthikeyan[3], T.Kalaiselvan[4]

[1]Associate Professor, Department of Mechanical Engineering,Paavai Engineering College, Namakkal-637018, India
[2]Professor, Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai-600062, India
[3]PAssistant Professor, Department of Mechanical Engineering,Paavai Engineering College, Namakkal-637018,India
[4]PG Scholar, Department of Mechanical Engineering,Paavai Engineering College, Namakkal-637018, India

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Keywords—EMM; $NaNO_3$; Al-TiC composite; Material Removal Rate; Overcut

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Kozak et al. investigated the detail transfer in this process from the cathodic tool electrode onto the anode work surface and studied the electrochemical copying of micro features. Application of ultra-short pulse current and ultra-small electrode gap were recommended for improving the capability of micro-ECM processes [4]. Liu Yong et al. successfully developed an EMM system, conducted experiments to find the predominant process parameters which then were applied to machine a complex microstructure [5]. Electrolytes are chosen to suit the dissolution of work material and different types of electrolytes have been tried to investigate their influence on the process. Acidified electrolytes have also been used to investigate their influence on the performance of the EMM process [6]. The absence of thermal stresses and mechanical stresses in the EMM process was successfully utilized to fabricate micro structures on NiTi Shape Memory Alloy by Joseph et al.[7]. Ramarao et al. investigated the dissolution rate of Al-B_4C composite in EMM machining by studying the effect of process variables [8]. The application of composite materials today pervade all industries and necessitates to explore different techniques to fabricate them into required shapes and sizes. The present study analyses the micro-machinability of Al-TiC composite through electrochemical micromachining process.

II. EXPERIMENTAL PREPARATION

A. Experimental System

The experiments were carried out in an EMM system developed for research purposes. The experimental system is a single axis setup comprising all the required components and controls like tool feed system, stepper motor,machining chamber, work holding device,electrolyte pump, electrolyte filter, pulse generator, electronic gap control kit.

B. Experimental details

The major factors involved in the experimentation and their description are given below in table I.

Static Analysis of Leaf Spring with Heterogeneous Concept

E.P.Shanmugham[1], R. Meiyazhagan[2], S. Karthikeyan[3]

[1]*PG Scholar Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India.*
[2]*Assistant Professor Department of Mechanical Engineering, Paavai Engineering College, Tiruchengode, Tamilnadu, India.*
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Abstract— Suspension system is a major unit in automotive design, especially leaf spring design. It absorbs payload and road loads to give comfort to vehicle. Loads travel through each leaf and produce contact stress with each contact members, this effectively reduces the life time of the spring system. Spring steels are majorly preferred as leaf spring material, but in practical nature vehicle caries loads that are much higher than designed limit and causes earlier failure to leaf spring, which is a catastrophic in a driving condition and should be avoided. Preferring composite materials is very costly. In this project work, a heterogeneous model leaf spring system is developed and numerically tested for a better suitability for the existing model. This model will introduce synthetic rubber sleeves between spring leafs, which is a elasticity material, this system is designed and modelled using PRO-E software, dimensions and loading data are taken from literature reviews. FEA based static analysis will be conducted to study the behaviours of existing and heterogeneous models and the effectiveness of new model will be evaluated.

Keywords: Leaf Spring, Synthetic Rubber, PRO-E Wildfire 4.0, ANSYS Workbench 13.0.

1. INTRODUCTION

The most common type of the leaf spring used in automobile is the semi-elliptical leaf spring. This spring consists of number of leaves, which are held together by U-clips. The long leaf fastened to the supports is called master leaf whose ends are bent to form an eye. Remaining leaves are smaller lever called graduated leaves. The perpendicular distance between the reference lines to the master leaf is called camber. The camber is provided so that even at the maximum load the deflected spring should not touch the machine member to which it is attached. The central clamp is required to hold the leaves of the spring The front end of the spring is connected to the frame with a simple pin joint, while the rear end of the spring is connected with a shackle. Shackle is the flexible link

which connects between leaf spring rear eye and frame. When the vehicle comes across a projection on the road surface, the wheel moves up, this leads to deflecting the spring. This changes the length between the spring eyes. The leaf spring should absorb the vertical vibrations and impacts due to road irregularities by means of vibrations in the spring deflection so that the potential energy is stored in spring as strain energy and then released slowly. So, the steel Leaf spring or composite leaf springs are easily damaged. In the present work, to increasing the energy storage capability of a leaf spring ensures a more compliant suspension system and then same time reduce the stress for flow to leafs and reduce the deformation of leafs.

2. SYSTEM MODEL

It is clear that, minimizing contact loading will yield improvement in the service life of the leaf spring system. The literature reviews provides enough guidance in leaf spring dimensional details, static loading details from experiment and finite element analysis. Most of the authors proposed composite material model as a better alternate for the leaf spring system, even though it has advantages in strength and fatigue life, it is nerve an economical model for vehicles in the present situation, more over the manufacturing and serviceability is difficult for them. Considering all these factors, a Hyper elastic material (Synthetic Rubber) as an interleaf between leaf springs is proposed in this project work. Rubber can elongate several hundred times than its original shape and retain the same after loading, this behaviour is called Hyper elastic, by introducing this Hyper elastic material between leaf spring members will absorb the loads and stress due them. The behaviours of this proposed heterogeneous model will be evaluated through static analysis and compared with the existing model.

3. PREVIOUS WORK

Malaga Anil Kumar et al. [1] describes that three different composite materials have been used for analysis of mono-composite leaf spring. They are E-glass/epoxy,

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[1]*PG Scholar Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India.*
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1. INTRODUCTION

The most common type of the leaf spring used in automobile is the semi-elliptical leaf spring. This spring consists of number of leaves, which are held together by U-clips. The long leaf fastened to the supports is called master leaf whose ends are bent to form an eye. Remaining leaves are smaller lever called graduated leaves. The perpendicular distance between the reference lines to the master leaf is called camber. The camber is provided so that even at the maximum load the deflected spring should not touch the machine member to which it is attached. The central clamp is required to hold the leaves of the spring The front end of the spring is connected to the frame with a simple pin joint, while the rear end of the spring is connected with a shackle. Shackle is the flexible link

which connects between leaf spring rear eye and frame. When the vehicle comes across a projection on the road surface, the wheel moves up, this leads to deflecting the spring. This changes the length between the spring eyes. The leaf spring should absorb the vertical vibrations and impacts due to road irregularities by means of vibrations in the spring deflection so that the potential energy is stored in spring as strain energy and then released slowly. So, the steel Leaf spring or composite leaf springs are easily damaged. In the present work, to increasing the energy storage capability of a leaf spring ensures a more compliant suspension system and then same time reduce the stress for flow to leafs and reduce the deformation of leafs.

2. SYSTEM MODEL

It is clear that, minimizing contact loading will yield improvement in the service life of the leaf spring system. The literature reviews provides enough guidance in leaf spring dimensional details, static loading details from experiment and finite element analysis. Most of the authors proposed composite material model as a better alternate for the leaf spring system, even though it has advantages in strength and fatigue life, it is nerve an economical model for vehicles in the present situation, more over the manufacturing and serviceability is difficult for them. Considering all these factors, a Hyper elastic material (Synthetic Rubber) as an interleaf between leaf springs is proposed in this project work. Rubber can elongate several hundred times than its original shape and retain the same after loading, this behaviour is called Hyper elastic, by introducing this Hyper elastic material between leaf spring members will absorb the loads and stress due them. The behaviours of this proposed heterogeneous model will be evaluated through static analysis and compared with the existing model.

3. PREVIOUS WORK

Malaga Anil Kumar et al. [1] describes that three different composite materials have been used for analysis of mono-composite leaf spring. They are E-glass/epoxy,

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Automatic Lid Controller For Laptop Using Microcontroller

S. Mohankumar [1], V.K. Gobinath [1], D.R.P. Rajarathnam [1], D. Jayanth [2], P. Sathish Kumar [2], P. Nandagopal [1]*

[1] Department of Mechatronics Engineering, [2] Department of Mechanical Engineering,
[1] Paavai Engineering College, Namakkal– 637 018, Tamil Nadu, India.
[2]Kongu Engineering College, Erode – 638 052, Tamil Nadu, India.
** Correspondence author, Tel.: +9195003 84502 e-mail mtsmohan@gmail.com*

***Abstract* - Automatic Lid controller (ALC) is a device which will control the operation of lid (Display Panel) of the laptop. This device will open the lid automatically when the supply has been given to the microcontroller. At the same time, it will close the lid automatically when the power has been removed from the device. Automatic Lid controller comprises of Microcontroller, Motor Drive Unit, Servo motors, and then software's for programming the device. An Automatic Lid controller does not need any external supply for functioning the microcontroller, it will acquire the power from USB port of the laptop itself. The Motor drive in the device will use 9 V power supply to run the motor. Automatic Lid Controller use the ATmega8 Microcontroller for the operation of the entire device. When the Power is obtained from USB port, the microcontroller will make the motor to run in forward direction for the required period of time. At the same time if the laptop has been turned off the power will be removed from the microcontroller so that it will make the motor to run in reverse direction for the required period of time.**

Keywords – Microcontroller; Servo motor; Motor Drive Unit; USB Connector

I. INTRODUCTION

A laptop or a notebook is a compact personal computer with a clamshell form factor, suitable for mobile use. Although there used to be a difference between laptops and notebooks (the former were massive and heavier than the latter), there is often no longer any difference in practice. A laptop associate the components and inputs of a desktop computer, including display, keyboard, and speakers and pointing device (such as a touchpad or a track pad) into an individual device. Utmost modern-day laptops also have a unified webcam and a microphone. A laptop can be powered either from a rechargeable battery, or by essential electricity via an AC adapter. Laptop is a diverse class of devices and other more specific terms, such as craggy notebook or convertible, refer to specialist types of laptops, which have been advance for specific uses. Hardware specifications change much between different types, makes and models of laptops. Portable computers, which later advanced into modern laptops, were originally treated to be a small niche market, mostly for functional field applications, like as the military, accountancy, for sales representatives etc. As portable computers matured and became more alike modern laptops, becoming smaller, lighter, competitive, and more powerful, they became very widely used for a variety of purposes.

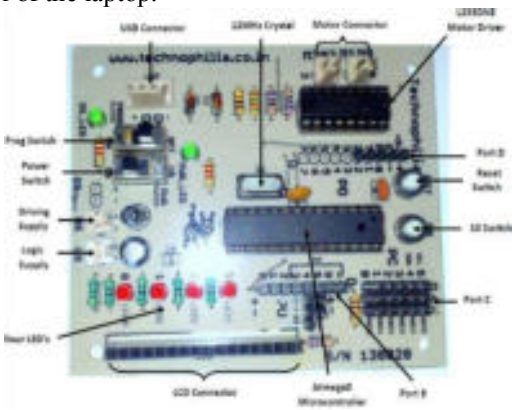
II. EXPERIMENT SETUP

The developed Automatic Lid Controller (ALC) comprises the following systems.

- Microcontroller
- Motor Drive Unit
- Power Supply
- Programming Software

A. Microcontroller

ALC uses the AVR Development Board shows below and used for operation of the display panel of the laptop.



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- Incorporate Atmel's ATmega8 microcontroller with 8kb flash memory working at 16MIPS.
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Studies on the Various Design and Manufacturing Parameters of Roller Shafts for Sugar Cane Mills Using FEA Technique

D.R.P.Rajarathnam[1] and Dr.M. Jayaraman[2]

[1]Assistant Professor, Paavai Engineering College, Namakkal, Tamilnadu, India.
[2] Principal and Professor, Velalar College of Engineering and Technology, Erode, Tamilnadu, India.
Email: drprajamalathi@yahoo.co.in

Abstract

The objective of this research paper is to analysis the strength of the roller shaft which has become major part of the sugar industry. The roller shaft is made up of forged steel is designed and analyzed the fatigue at the pinion end of the shaft which caused shearing effect. The present study deals with the minimizing the effect of fatigue on the roller shaft which is subjected to various factors such as over load of bagasse due to over loading of the sugarcane in the cane milling, increasing in pressure due to foreign materials like iron or steel which was too big or too hard, due to friction between the gun metal bush with the shaft, due to insufficient lubrication and cooling, due to increasing in pressure between rollers. The performance of the roller shaft was thoroughly analyzed to eliminating the shearing of roller shaft, change in deformation, material combination, minimizing the erosion due to friction, thermal distribution.PRO – E software is used to design and ANSYS software is used to analysis the strength, load bearing capacity, deformation, stress and thermal distribution in the roller shaft. Stress distribution is reduced to increase the performance of the roller shaft in minimizing the fatigue and economy aspects. The life duration of the shaft was increased when proper loading of sugarcane and lubrication system is used. The aesthetic value of the shaft is very good when fatigue influencing factors are reduced.

Keywords: Fatigue, PRO-E, ANSYS, Pinion, Shear stress, Thermal stress, Shaft.

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Methodologies Used for Roll Shaft Failure Analysis in Sugar Industries -A Review

D.R.P.Rajarathnam[1] Dr.M.Jayaraman[2] Dr.K.K.Ramasamy[1] and Dr.M.Premkumar[1]

[1]*Professor, Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India.*

[2] *Principal and Professor, Department of Mechanical Engineering, Velalar College of Engineering and Technology, Erode, Tamilnadu, India.*

Email: drprajamalathi@yahoo.co.in

Abstract

The goal of this review is to analysis the roller shaft failure which has to be a significant issue in sugar cane industries. The roller shaft made up of forged steel is designed and analyzed the fault at the pinion end of the shaft which brought about shearing impact. The techniques utilized by different analysts for roller shaft failure are introduced here. The preventive measure manages minimizing the impact of fatigue on the shaft which is subjected to different factors, for example, over-burden of bagasse because of overloading of the sugarcane in the milling process, build in pressure because of outside materials like iron or steel because of rubbing between the gun metal bush bearings with the shaft, because of lacking grease and cooling, because of increment in pressure between rollers. The performance of the shaft could be enhanced by diminishing the friction and thermal distribution which minimizes the impact of exhaustion. The life of the roller shaft could be expanded by uniform loading of sugarcane in cane carrier. In this review paper different methodologies used to decrease the reason for failure and to enhance the shaft life by different researcher have been introduced.

Keywords*:* Failure, Pinion, Shear stress, Methodology, Roll Shaft

I. Introduction

Shaft is a typical and paramount machine component. It is a rotating part, all in all, has a roundabout cross-area and is utilized to transmit power. The shaft may be hallow or solid. The shaft is upheld on bearings and it pivots a set of gears or pulleys with the end goal of force transmission in different applications. The shaft is generally acted upon by bending moment, torsion and axial force. For such shafts the issue is basically by fatigue loading. The shaft failures have included numerous researchers and engineers widely trying to discover the reason for failures and proposed numerous methods to prevent the failures.

II. Literature Review

1. J.S. Rivas, J.J.Cornado, A.L.Comez

This paper depicts the tribological perspectives for the shafts and bearing of sugar factories. The shaft is subjected to fast abrasive wear rate because of the presence of Mineral Extraneous Matter (MEM) between the shaft and bronze bearing which lessens the shaft life. J.S. Rivas [1] had done Submerged Arc Welding Process (SAW) to reconstruct the worn shaft journal. Wear mechanisms exhibit on the shaft was recognized and bearing tribological pair and the mechanical phenomena in the tribological pair was investigated and a block on ring tribometer was tried at diverse mixtures of bearing materials and lubricants.

It was examined that abrasive wear on the journal surface was caused by the MEM entering on the journal crevice. They have recommended that the welding methodology would need to repair a worn shaft and the hardness in the Heat

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An Experimental Investigation on Abrasive Wear Behaviour of Different Ceramics Coating on AISI 1040 Steel by Plasma Process

[1]D.R.P. Rajarathnam, [2]M. Jayaraman, [1]K.K. Ramasamy,
[1]M. Premkumar and [3]D. Sathya Narayana

[1]Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India
[2]Department of Mechanical Engineering,
Velalar College of Engineering and Technology, Erode, Tamilnadu India
[3]Prudential Sugar Corporation Ltd., Chittoor Andhra Pradesh, India

Abstract: This study analyzes by the plasma technique, the microstructure and abrasive wear performance of AISI1040 steel surface coated with 85% Al_2O_3, 15% TiO_2, 55% TiO_2, 45% Cr_2O_3, 40% Cr_2O_3, 60% TiO_2 and 99% Cr_2O_3 ceramic materials. To the present finish, the surface of AISI 1040 steel was covered with the ceramic materials of 85% Al_2O_3, 15%TiO_2,55% TiO_2, 45% Cr_2O_3, 40%Cr_2O_3,60%TiO_2 and 99% Cr_2O_3, using the plasma technique. Following the coating method, the abrasive wear behaviour of every sample was tested by the pin-on-disc technique. ZrO_2 grating paper was utilized as abrasive. The best wear behaviour was obtained with the ceramic coating containing 85% Al_2O_3 that was trailed by 60% TiO_2, 55% TiO_2 and 45% Cr_2O_3 respectively. All time low wear resistance was ascertained in 99% Cr_2O_3 ceramic coating. Wear resistance of the samples enhanced with increasing micro hardness value. Micro cracking is that the main wear mechanism within the samples with high micro hardness values, whereas micro scratching-type wear method was detected within the samples with low hardness values.

Key words: AISI 1040 • Plasma Technique • Abrasive Wear • Ceramic • Pin-on-Disc • Micro-Structure

INTRODUCTION

Wear involves the physical removal of material from a solid object. Wear rates are less affected by temperature than the corrosion. However, as the wear surface temperature approaches the softening temperature of the substrate, wear rates increase dramatically. Wear can be classified into three general categories: abrasive, adhesive and fatigue wear. Abrasive wear can result from two surfaces rubbing together, with the harder surface grinding away the softer surface many corrosion resistant coatings that are not considered to be "Hard" are quite effective when wear is not a concern.

AISI 1040 carbon steel has high carbon content and can be hardened by heat treatment followed by quenching and tempering to achieve 150 to 250 ksi tensile strength. C1040 is a medium carbon, medium tensile steel supplied as forged or normalized. This steel shows good vigour and wear resistance. C1040 is good for flame or induction hardening. It is a multifaceted forging material with mechanical properties that are appropriate for a full range of applications. This grade of steel is utilized for forged parts where the strength and toughness of the material are appropriate. C1040 may be employed for the manufacture of forged crankshafts, roller shaft and couplings, along with a range of parts where the properties of heat-treated C1040 are suited to the application.

Tahar Sahraousi [1] in his article describes wear resistance and potentials of HVOF sprayed Cr_3C_2 -NiCr and WC-Co coatings for a possible replacement of hard chromium plating in gas turbine components repair and that the coatings exhibit high hardness with a high volume fraction of carbides being preserved during the spraying and have different wear behaviour.

D.N. Hanlon [2] in his paper he illustrated the response of spray forming on the wear properties of 1.2C-3.4W-8.9Cr-4.3V-2.7Mo high speed steel. The microstructure, fracture behaviour and wear response

Corresponding Author: D.R.P. Rajarathnam, Department of Mechanical Engineering,
Paavai Engineering College, Namakkal, Tamilnadu, India.

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Published Online 31 December 2015. **Research Article**

Comparative Wear Resistance of Cr_2O_3-TiO_2 Coating on AISI 1040 Steel by Using Plasma Process

[1]D.R.P.Rajarathnam, [2]Dr.M. Jayaraman, [3]Dr.K.K.Ramasamy

[1]*Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India.*

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ABSTRACT

This study analyzes by way of the plasma method, the microstructure and abrasive wear overall performance of AISI1040 steel surface coated with 55% TiO_2, 45% Cr_2O_3, 40% Cr_2O_3, and 60% TiO_2 ceramic materials. In the prevailing end, the surface of AISI 1040 steel was covered with the ceramic materials of 55% TiO_2, 45% Cr_2O_3, 40%Cr_2O_3, and 60%TiO_2 the usage of the plasma method. Following the coating method, the abrasive wear behaviour of each sample was examined by means of the pin-on-disc approach. ZrO_2 grating paper became applied as abrasive. The quality wear behaviour was acquired with the ceramic coating containing 45% Cr_2O_3 that was trailed by 40% Cr_2O_3 60% TiO_2 and 55% TiO_2 respectively. All time low wear resistance was ascertained in 45% Cr_2O_3 ceramic coating. Wear resistance of the samples stronger with growing micro hardness values. Micro cracking is that the primary wear mechanism within the samples with high micro hardness values, whereas micro scratching-type wear technique become detected in the samples with low hardness values.

Key words: AISI 1040, Plasma technique, Abrasive wear, Ceramic, Pin-on-disc, Micro-structure.

INTRODUCTION

Small scale, heavy mechanical industries (thermal power plant, hydro power plant), vehicle industries, sugar industries, defense industries and aviation industries are struggling through failure of aspect. Once in a while it is also observed that the element which turned into failed due to those motives were very a good deal higher priced and that also takes too much time to manufacture due to complex geometry or substitute no longer possible. To prevent from those issues, both we must redesign the component taken into consideration of wear, corrosion, oxidation and so forth, in order that purpose get solved or we should modify the surface property of component so that the specific components would able to resist wear and withstand against the forces acting on it which is known as surface engineering. In these days, surface remedy of the metal surface of an engineering component is executed through both of these processes like enhancing the chemistry of the surface, surface metallurgy or plasma method.

AISI 1040 carbon steel has excessive carbon content and may be hardened by using heat treatment followed by quenching and tempering to acquire 150 to 250 ksi tensile strength. C1040 is a medium carbon, medium tensile metallic furnished as cast or normalized. This steel indicates good vigor and wear resistance. C1040 is ideal for flame or induction hardening. It is a multifaceted forging material with mechanical properties which might be appropriate for a complete range of applications. This grade of steel is utilized for forged parts wherein the strength and sturdiness of the material are suitable. C1040 can be employed for the manufacture of solid crankshafts, roller, shaft and couplings, on the side of a variety of parts where the homes of heat-handled C1040 are acceptable to the utility.

Tahar Sahraousi [1] in his article describes wear resistance and potentials of HVOF sprayed Cr_3C_2 – NiCr and WC–Co coatings for a probable

Corresponding Author: D.R.P.Rajarathnam, Department of Mechanical Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India.
E-mail:drprajamalathi@yahoo.co.in

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Automatic Lid Controller For Laptop Using Microcontroller

S. Mohankumar [1], V.K. Gobinath [1], D.R.P. Rajarathnam [1], D. Jayanth [2], P. Sathish Kumar [2], P. Nandagopal [1]*

[1] Department of Mechatronics Engineering, [2] Department of Mechanical Engineering,
[1] Paavai Engineering College, Namakkal– 637 018, Tamil Nadu, India.
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** Correspondence author, Tel.: +9195003 84502 e-mail mtsmohan@gmail.com*

***Abstract* - Automatic Lid controller (ALC) is a device which will control the operation of lid (Display Panel) of the laptop. This device will open the lid automatically when the supply has been given to the microcontroller. At the same time, it will close the lid automatically when the power has been removed from the device. Automatic Lid controller comprises of Microcontroller, Motor Drive Unit, Servo motors, and then software's for programming the device. An Automatic Lid controller does not need any external supply for functioning the microcontroller, it will acquire the power from USB port of the laptop itself. The Motor drive in the device will use 9 V power supply to run the motor. Automatic Lid Controller use the ATmega8 Microcontroller for the operation of the entire device. When the Power is obtained from USB port, the microcontroller will make the motor to run in forward direction for the required period of time. At the same time if the laptop has been turned off the power will be removed from the microcontroller so that it will make the motor to run in reverse direction for the required period of time.**

Keywords – Microcontroller; Servo motor; Motor Drive Unit; USB Connector

I. INTRODUCTION

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II. EXPERIMENT SETUP

The developed Automatic Lid Controller (ALC) comprises the following systems.

- Microcontroller
- Motor Drive Unit
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- Programming Software

A. Microcontroller

ALC uses the AVR Development Board shows below and used for operation of the display panel of the laptop.

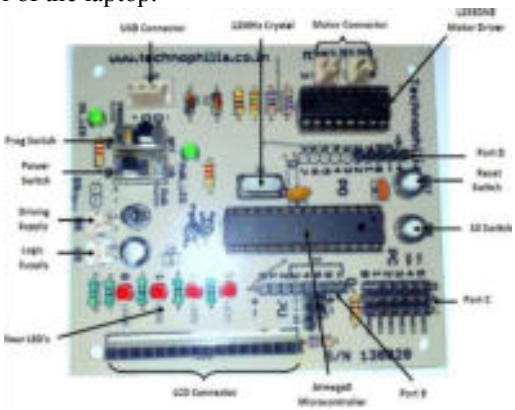

Fig. 1 AVR Board

1) AVR Board Description

- Incorporate Atmel's ATmega8 microcontroller with 8kb flash memory working at 16MIPS.
- On-board motor driver for associating 2 DC motors or 1 stepper motors.

Overview on Mobile Application Learning Management System

B.Venkatesan[1], M.Abubackkar Shithik[2]
[1]Assistant Professor, [2]UG Student, Department of Information Technology,
Paavai Engineering College, Namakkal. E-mail: balavenkatbe@gmail.com

Abstract: **Cross Platform Mobile Application Development is the development of mobile based applications so that the development of these types of applications can be made platform-independent. A review has been made in this field while considering Integrated Development Environment is being proposed which will help a software developer to code an application in a single code base and deploy that single code base to multiple operating systems meaning if a developer codes in Java for Android, the developer can deploy the same Java code to Ios subsystem. First the development of a operating system compatibility architecture which helped to run unmodified iOS binaries on Android operating system and second phase of proposed solution helped to understands the cross-platform application development tools which are currently available in the market. The third step is to understand such cross-platform development tools in more detail and finally a mathematical model based application.**

Keywords: ***Cross-Platform Mobile Application Development, IDE, Android Development, iOS Development, Cross-Platform.***

1. INTRODUCTION

In the present era of proliferating computer networks, and electronic devices (mobiles, tablets, PCs) every individual and organization is trying to get access to information and use these devices for their advancement and improved performance. Electronic information is accessible to a huge population in the world. Mobiles have become so much common that we have started to use it in every sphere of life. Whether it is entertainment or education, we can see a very intense use of mobiles and we can consider them as a new personal computer. It doesn't mean that desktop computers are now useless, but the mobile devices market is growing fast. They are cheap, convenient because of their portability, and due to geo location often more useful than PC. Desktop applications are now commonly communication based and application developers develop a single application in cross-platform that can easily run on different desktop platforms e.g. Mac or Windows. There is an increasing demand of mobile applications to use mobile devices, but an application development for mobile devices is not so simple and it's a big challenge. These mobiles have different operating system and unlike PC OS, mobile OS decides the type of programming language required for applications running on it. So we need to design the mobile application according to its platform.

There are various categories of app development for mobiles broadly categorized into three, namely, native apps, mobile web apps and hybrid apps and according to the app categories and platforms, we have different choices in programming languages and framework for mobile application development. For running an application on multiple platforms, a cross-platform framework is required. Cross-platform frameworks for PC app are not adaptable to mobile app, so vendors provide cross-platform framework

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Statistical Image Quality Assessment for Fake Biometric Detection Based on SVM Classification: Application to Iris, and Face Recognition

R.Jayavadivel[1], B.Prabhushankar[2] , S.Rajesh[3]

Assistant Professor, Department of IT, Paavai Engineering College, Namakkal, Tamilnadu, India

Associate Professor, Department of IT, Paavai Engineering College, Namakkal, Tamilnadu, India

Assistant Professor, Department of CSE, Paavai Engineering College, Namakkal, Tamilnadu, India

ABSTRACT: Image quality assessment plays an important role in the performance of biometric system involving iris and face images. Data quality assessment is a key issue in order to broaden the applicability of iris and face biometrics to unconstrained imaging conditions. In this paper, we have proposed the quality factors of individual iris images by assessing their prominent factors by their scores. Biometric systems based on iris and face is vulnerable to direct attacks consisting on the presentation of a fake iris to the sensor. Widening a previous work, several state of- the-art iris liveness detection methods were implemented and adapted to a less-constrained scenario. The proposed method combines a feature selection step prior to the use of state-of-the art classifiers to perform the classification based upon the "best features". Support Vector Machine (SVM) classification technique is used for training and testing thE Iris and Face images. The testing input Iris and Face image is resulted as real and fake Iris and Face image by quality score matching with the training based real and fake Iris and Face samples.

KEYWORDS: Image quality, Iris and Face liveness detection biometrics security, support vector machine (SVM).

I. INTRODUCTION

Biometric systems rather identify an individual by what he is instead of based on something he knows or possesses. Considering that any piece of material or knowledge can be fraudulently acquired biometrics can offer several advantages over classical security methods. However, in spite of its advantages, biometric systems have some drawbacks, including the lack of secrecy, the fact that a biometric trait cannot be replaced and its vulnerability to external attacks which could decrease their level of security. It is necessary to keep in mind the security issues when we explore a whole new world of possibilities in this networked society of nowadays. Our mobile devices are turning into storages of personal, professional, commercial, and other kinds of information. This information is intended by the users to be kept confidential.

The necessity of controlling the access to this information opens the way to the concept of "mobile biometrics". Among the different existing biometric traits, iris has been traditionally regarded as one of the most reliable and accurate. Also the imaging properties of the handheld devices make this trait instinctive to use. Therefore the development of iris liveness detection techniques is crucial for the deployment of iris biometric applications in daily life. In a previous work we explored the use of countermeasures against spoofing attacks [1]. These attacks may consist on presenting a synthetically generated iris to the sensor so that it is recognized as the legitimate user and access is granted. The most common and simple approaches are those carried out with high quality iris printed images [2]. However, other more sophisticated threats have also been reported in the literature such as the use of contact lenses [3].

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Dynamic Allocation of Circular Buffer with Circular Linked List Technique for Real Time Multimedia Application across Slow Speed Links

R.Jayavadivel[1], Dr.J.Sundararajan[2], G.Arulselvam[3]

Assistant Professor, Department of IT, Paavai Engineering College, Pachal, Namakkal, Tamilnadu, India.[1]

Principal, Paavai College of Technology, Pachal, Namakkal, Tamilnadu, India.[2]

B.Tech, Department of IT, Paavai Engineering College, Pachal, Namakkal, Tamilnadu, India.[3]

ABSTRACT: Today Multimedia and its applications play a major role of importance in Internet, at the same time it also have an equivalent drawback parameters in accessing and using them. In this paper, the common problem in Multimedia application has been discussed by providing a common solution for that. This paper is investigating a new concept called" a Circular buffer with circular linked list concept with dynamic allocation method was proposed in adjusting the video frame rate into a TCP-circular buffer .It also developed in aim to eradicate the Buffer and Packet Loss drawback parameters across the slow speed links .The simulation program was written in Matlab v1.4 to monitor the Buffer fullness and circular Liked list links the buffer towards each other virtually where the H.264 encoder is allowed to trace and test the data. In this arrangement, the buffer occupancy was made above 95% usage and maintains 20% of packet loss avoiding techniques.

KEYWORDS: Circular Linked List, Packet Loss, Buffer Occupancy.

I. INTRODUCTION

Over the year, the internet growth and usage became wider in ranges across the globe. However the ranges of applications such as multimedia, documents, etc., get tremendous growth in extend. as it can be observed that traditional applications like bulk file transfer, static websites are no longer sufficient for today's internet application usages[1].hence, we need to overcome the higher bandwidth allocation and wide spectrum are need in using such applications efficiently. Today most of the applications are based on real-time delivery of data such as video conferencing, internet-telephony and video & audio streaming are in usages. Video conferencing enables the continuous delivery and play back of video which overcomes the drawback of downloading and uploading the files in internet. The United States Federation Communication defined the Slow-Speed links as data transmission speed of almost 4Mbps and download stream as 1Mbps.the new application gives rise to the other drawbacks such as packet loss, delivery delay, buffer Management, transmission rates, etc., several problems to be solved before the transmission of video using data streaming activities. Circular buffer linked list increases higher data transmission rate with real-time implementation. It also overcomes the packet loss drawbacks too.

The video get into several processes before it introduced into the network system. Ithas to do a plenty of mechanisms in transferring the data from source to destination along a network path. In using TCP-IP buffer on figuration management, the data to be transmitted get compressed in reducing its size and encoded (encrypted) format for security and memory size capability too. Theactual encoded data the passes into the buffer for temporary management and storage of data where to avoid the network traffic (congestion) level to higher extends. Butmeanwhile there are many drawbacks available in establishing the data to the network leads to video buffering are video streaming mechanism to avoid such drawbacks in an efficient manner the Dynamic Circular buffer get allocated in maintain high speed and minimum buffering problem to their grater extends in this method ,we are using Circular linked list concept and

CULTURAL INHERITANCE IN THE SELECT PLAYS OF AMIRI BARAKA

Dr. R. Shanthi
Associate Professor & Head, Paavai Engineering College, Pachal, Namakkal.

Amiri Baraka is the major Avant-garde artist who has helped to turn black art from other ethnically centred. He remains as a major aesthetic force in Afro-American drama. He brought to the stage black cultural experiences, rituals, and language as well as anger and the burning need to find a solution to the problems, of living in the racist society. Baraka's work has paved the way for a whole generation of black playwrights.Black art is collective, functional and committed, for it derives from the collective experience of black people, and is committed to revolutionary change. He emphasized seperatism, revolutionary action, community involvement, new aesthetics and innovations in form and structure. The purpose of Black Theatre was to give testimony to the ancient foundations of black culture, to protest injustices, to project emerging images of new black, to give voice to the many and varied expressions of black creativity.His themes are cultural alienation, racial tension and conflict, sexual, ethnic and racial identity necessity for social change through revolutionary means. Baraka in his plays *A Black Mass* and *Slave Ship* depicts the cultural citations of Africa in the disheartening environment of America.

In *A Black Mass*, one of the trio of magicians, Jacoub, persists in creating a wild white beast an unbiased creature which is a neutral being. He believes that he can tame through love. We then hear a vast explosion and see a blinding light with the music of Sun-Ra blaring in the background, a beast appears. The beast is white with a red, lizard-devil mask which completely covers the head and ends up as a lizard spine cape. It screams, leaping and salivating laugh through the spectators. Everyone screams at the sight. The beast leaps into the audience and hops around, all the while screaming, "white, white, white." The other two magicians immediately recognize that Jacoub has created a soulless monster. The creature has neither feelings nor regard for human life. The beast grabs one of the black women by the gullet. Soon after, she clutches her throat and turns into a grunting white monster jumping around on stage. She too begins the chant, "white, white, white". The magicians cast a magic charm that imprisons the two beasts in a invisible cell. Although Jacoub is worried by the changes in the woman, he still believes it is possible to reach the beast how to feel. The two other magicians opposed.

Sure of his ability to reach the beasts, Jacoub breaks the spell and liberates the two beasts from their barely visible imprisonment. As soon as they were released, the two beasts assault and slaughter the two magicians and the women gather around. Only then Jacoub realises his mistake. The beasts attack him as he is dying; he enforces a curse on the beasts that drive them out to the caves. After the beasts leave, we hear the narrator's voice over the loudspeaker: And so brothers and Sisters, these beasts are still loose in the world. Still they spit their hideous cries. Let us find them and slay them. Let us lock them in their caves. Let us declare the Holy War. The Jihad. Or we cannot deserve to live. 'May god have mercy' is repeated until the stage

WOMEN: THE GUARDIAN ANGELS IN THE SELECT NOVELS OF JOHN GARDNER

Tara Tripura Sundari
Assistant Professor, Paaval Engineering College, Nammakal.

1. Introduction

Gardner (1933-82), a medieval scholar and a prolific novelist, is often cited as one of America's most brilliant and exciting writers of fiction. He is an American novelist, short story writer, critic, Old and Middle English scholar and a superb storyteller. He intertwines modern-day realism with medieval fantasies. Among contemporary American writers—indeed among writers anywhere at any time — John Gardner was one of the most prolific—thirty-three separate book publications—and one of the most loquacious—more than one hundred and fifty known interviews and speeches. His was, as well, one of the most varied literary careers in recent years. Gardner also made name for himself as a writer of short stories and children's literature, as a critic, editor, translator, biographer, reviewer, medievalist, poet, editor, anthologist, and librettist.

As both an artist and a critic, Gardner believes that art should serve a moral purpose, that essentially art is a game played against chaos and death. The subject of his work is often drawn from myth and legend. Admitting indebtedness to Chaucer, Dante, and Walt Disney, Gardner is consistently drawn to the fairy tale for the source and style of his writing. The breadth of his learning is revealed in the wealth of allusion from the entire spectrum of Western literary and philosophical tradition found in his work. There is a well known adage that, "There is a woman behind every man's success". This idea is well represented in almost all the novels of John Gardner. The female characters in his novels serve as tool of enlightenment for the transformation of the male characters.

2. The Resurrection

In the novel The Resurrection immediately after the diagnosis of his illness, Chandler, the protagonist, decides to return to Batavia in western New York, the town in and near which he (and the author) grew up. He is counting his days. Hence, he wishes to spend the last days of his life in his home town with his family members and friends. He, his wife, and their daughters stay in Batavia, with his mother. Also still alive are the Staley sisters, his mother's friends. One was a painter, though she now is senile; one still gives piano lessons; and one, now deaf, was once a singer. Their niece, Viola, takes care of them and their house. Their house is ill-used by them and their life is bitter. She comes to stay at Chandler's house and takes care of the family members, When Chandler is hospitalized.

2.1. Viola.

Viola, after spending a few memorable days with Chandler's family, returns to her aunts' house. Viola goes to visit Chandler, the father figure to whom she feels herself romantically drawn:

"And at last . . . She was in love—in no platonic way either— with James Chandler" . . . I love him, she thought. I love him. Dear God, I love him!" (Resurrection, p. 213).

She experiences real freedom and happiness for the first time. She feels the

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Effect of Mg doping on structural, optical and photocatalytic activity of SnO_2 nanostructure thin films

S. Vadivel · G. Rajarajan

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Abstract In the present work, magnesium (Mg) doped SnO_2 nanocrystalline thin films were synthesized by simple chemical bath deposition technique. The as-deposited films were annealed at 600 °C for 5 h in ambient atmosphere in order to improve crystallinity and structural perfection. The influence of Mg doping on structural, optical, and morphology of thin films was studied by X-ray diffraction (XRD), Raman spectra, UV–Vis Spectra, photoluminescence, and atomic force micrograph images. The XRD measurements showed that films had a tetragonal rutile type structure with P*42/mnm* symmetry and the results were good in agreement with the standard JCPDS data (card no: 41-1445). The surface roughness has been found to decrease with the increase of the dopant concentration as investigated by atomic force microscopy. The optical band gap energy of pure SnO_2 has been found to be in the range of 3.63 eV and it is shifted to 3.42 eV for 10 wt% Mg doping. In the Raman spectrum, two active mode (A_{2u} and E_u) were observed for Mg–SnO_2 thin films. The photocatalytic activities of the films were evaluated by degradation of methylene blue rhodamine B in an aqueous solution under ultraviolet light irradiation. The photocatalytic activity of Mg (10 wt%) doped SnO_2 film was much higher than that of the pure SnO_2. The samples were further characterized by photoluminescence spectra analysis.

S. Vadivel (✉)
Department of Physics, Paavai Engineering College, Namakkal 637 018, Tamilnadu, India
e-mail: vadivel.physics@gmail.com

G. Rajarajan
Department of Physics, Selvam College of Technology, Namakkal 637 003, Tamilnadu, India

1 Introduction

Transparent conducting oxides (TCOs) are a unique type of materials that combine electrical conductivity and optical transparency, simultaneously, with a wide range of applications e.g. displays, low emissive (low-e) windows, thin film photovoltaic (PV), smart devices, gas sensor and solar cell [1]. Among the various types of TCOs materials (ZnO, TiO_2, WO_3, In_2O_3), tin dioxide SnO_2 semiconductors have been keenly studied due to their excellent chemical stability and optical and electrical properties [2]. SnO_2 has the rutile type tetragonal structure belonging to the P*42/mnm* space group. The lattice parameters are a = b = 4.7382 and c = 3.1871 Å, and the band-gap energy is in the ultraviolet range between 3.5 and 3.8 eV as estimated from experimental results and theoretical calculations [3]. Its high optical transparency, electrical conductivity, and chemical stability make it a very attractive material for solar cells, heat mirrors, catalysis, flat panel displays and gas sensing applications. Many methods have been tailored to synthesis SnO_2 thin films such as, chemical vapour deposition [4], sol–gel dip coating [5], RF magnetron sputtering [6], spray pyrolysis [7], and thermal evaporation method [8], etc. Compared with the above methods, the chemical bath deposition method (CBD) is one of the suitable methods for preparing highly efficient thin films in a simple manner. The growth of thin films strongly depends on growth conditions, such as duration of deposition, composition and temperature of the solution, and topographical and chemical nature of the substrate. Chemical bath deposition yields stable, adherent, uniform and hard films with good reproducibility by a relatively simple process. So, in the present work, we have adopted to the CBD to synthesis of Mg doped SnO_2 thin films. Photocatalytic efficiency of SnO_2 nanocatalysts to meet practical

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Influence of Cu doping on structural, optical and photocatalytic activity of SnO_2 nanostructure thin films

S. Vadivel[1] · G. Rajarajan[2]

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Abstract This paper describes the pure and copper doped SnO_2 nanocrystalline thin films with large specific surface areas fabricated on a desired substrate using a simple chemical bath deposition technique. The as-deposited films were annealed at 500 °C for 2 h in ambient atmosphere in order to improve the crystallinity and structural perfection. The influence of Cu doping on structural, optical, and surface topography of the thin films was studied by X-ray diffraction (XRD), Raman spectra, UV–Vis spectra, photoluminescence, and atomic force micrograph images. The XRD measurements showed that films had a tetragonal rutile type structure with P*42/mnm* symmetry and the results were good in agreement with the standard JCPDS data (card no: 41-1445). The surface roughness and porosity has been found to decrease with the increase of the dopant concentration as investigated by atomic force microscopy. The characteristic Raman peaks observed at 325, 466, 672 and 745 cm^{-1} were respectively revealed infrared active (E_u), Raman active (E_g), (A_{1g}) and (B_{2g}) vibration modes of pure tetragonal rutile SnO_2 structure. The optical band gap energy of pure SnO_2 has been found to be in the range of 3.68 eV and it is shifted to 3.32 eV for 10 wt% Cu doping. The photocatalytic activities of the films were evaluated by the degradation of methylene blue rhodamine B in an aqueous solution under ultraviolet light irradiation. The photocatalytic activity and reusability of Cu (10 wt%) doped SnO_2 film was much higher than that of the pure SnO_2.

✉ S. Vadivel
vadivel.physics@gmail.com

[1] Department of Physics, Paavai Engineering College, Namakkal 637 018, Tamilnadu, India

[2] Department of Physics, Selvam College of Technology, Namakkal 637 003, Tamilnadu, India

1 Introduction

Textiles industry wastewater is heavily charged with unconsumed dyes, surfactants and sometimes traces of metals. These effluents cause a lot of damage to the environment. In most countries researchers are looking for appropriate treatments in order to remove pollutants, impurities and to obtain the decolourization of dye house effluents [1]. Metal oxide semiconductors with small and medium band gaps show lower light-harvesting ability in visible light [2]. Therefore, coupling of semiconductors with different band gaps is a good approach to prepare photo catalysts with high activity and good stability. Among the large number of metal oxides (TiO_2, ZnO, WO_3 and In_2O_3), tin oxide (SnO_2) has become a promising material due to its unique properties such as high electrical conductivity, high optical transparency in the visible part of the electromagnetic spectrum. This metal oxide has wide range of applications in low emission glass, electrodes, organic light emitting diodes optoelectronic devices, lithium batteries, gas sensors, heat reflectors and polymer based electronics [3]. Moreover, SnO_2 exhibits good activity and stability under irradiation. However, the pure SnO_2 shows much lower photo catalytic activity even under UV irradiation due to its large band gap (3.6 eV) [4]. To improve its photo catalytic activity, it is necessary to couple SnO_2 with another semiconductor with lower band gap. The CuO is a p-type semiconductor with a small band gap (1.7–1.2 eV). If the SnO_2 is coupled with the CuO, the n-SnO_2/p-CuO heterojunctions can be formed in. The photo generated electrons from SnO_2 can easily migrate to CuO. This favors the separation of photo generated

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Effect of W doping on structural, optical and photocatalytic activity of SnO_2 nanostructure thin films

S. Vadivel[1] · **G. Rajarajan**[2]

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Abstract Thin films of undoped and tungsten (W) doped SnO_2 have been synthesized on a glass (ITO) substrate using a simple chemical bath deposition technique. The as-deposited films were annealed at 500 °C for 5 h in ambient atmosphere in order to improve the structural perfections and crystallinity. X-ray diffraction studies showed that the W: SnO_2 films were polycrystalline in nature with tetragonal rutile type structure of SnO_2 phase. The surface roughness and porosity have been found to decrease from 47 to 39 nm with the increase of dopant concentration as investigated by atomic force microscopy. The optical absorption edge was found to be 3.46 eV, while the higher concentration of W doped films shifted towards lower energy (red shift) in the range of 3.35 eV. The effect of W on impurity, defect states and oxygen vacancy of the SnO_2 film was analyzed by photoluminescence spectra. The photocatalytic activities of the films were evaluated by the degradation of methylene blue (MB) rhodamine B (RHB) in an aqueous solution under visible light irradiation. The photocatalytic activity and reusability of W (10 wt%) doped SnO_2 films were much higher than that of the pure SnO_2. The improvement mechanism of RHB by W-SnO_2 catalyst was also discussed.

✉ S. Vadivel
vadivel.physics@gmail.com

[1] Department of Physics, Paavai Engineering College, Namakkal 637 018, Tamilnadu, India

[2] Department of Physics, Selvam College of Technology, Namakkal 637 003, Tamilnadu, India

1 Introduction

In recent years, transparent conducting oxide (TCO) films like, SnO_2, ZnO, TiO_2 and WO_3 have reached a vital place in a variety of optoelectronic devices such as solar cell, gas sensor, flat panel displays, and varistors [1]. Hence, there has been a growing attention in the applications of TCO films in solar cell device. Among these, SnO_2 serves as an important material due to its excellent chemical stability, optical and electrical properties. SnO_2 is an important n-type semiconductor with a wide band gap (Eg = 3.6 eV, at 27 °C) and it is well known for various potential applications such as excellent gas sensors, electrode materials in Li/SnO_2 batteries, catalysts [2] and so on. In addition to this, they exhibit low electrical resistivity and high electrical transmittance in the visible light and near IR region. Many methods have been adopted to synthesize of SnO_2 thin films such as, sol–gel [3], pulsed plasma deposition [4], pulsed laser deposition [5], reactive evaporation [6] and chemical bath deposition [7] methods. Among these techniques, chemical bath deposition method is an attractive method to get intended thin films. Moreover chemical bath deposition yields stable, adherent, uniform and hard films with good reproducibility by a relatively simple process [7]. So in the present work, we adopted chemical bath deposition method to synthesize of pure and W doped SnO_2 thin films.

Generally, SnO_2 suffers from low photocatalytic efficiency because of its wide-band gap (energy of the band gap is about 3.6 eV) and high recombination rates of photo generated electron–hole pairs. This deficiency hinders SnO_2 photocatalyst using widely and practically in the environmental application [8]. To overcome this problem doped with suitable metal ions can increase the photocatalytic activity. Many researchers have paid much attention

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Comparative investigation of $CuFe_2O_4$ nano and microstructures for structural, morphological, optical and magnetic properties

G. Raja [a,*], S. Gopinath [b,c], R. Azhagu Raj [d], Arun K. Shukla [e], Mansour S. Alhoshan [e], K. Sivakumar [f]

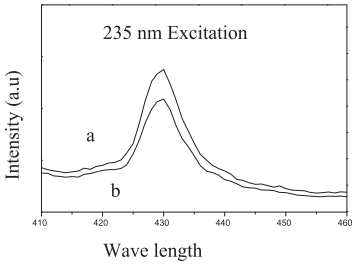
[a] Department of Chemistry, Paavai Engineering College, Pachal (Post), Namakkal 637018, Tamilnadu, India
[b] Department of Chemistry, K.S. Rangasamy College of Technology, Tiruchengode 637215, Tamil Nadu, India
[c] Research and Development Centre, Bharathiar University, Coimbatore 641046, India
[d] Department of Animal Science, Manonmaniam Sundaranar University Tirunelveli, 627012 Tamilnadu, India
[e] King Abdullah Institute for Nanotechnology, King Saud, University, P.O. Box 2455, Riyadh 11451, Saudi Arabia
[f] Department of Chemistry, Adhiyamaan College of Engineering, Hosur 635109, Tamil Nadu, India

HIGHLIGHTS

- Copper ferrite nanostructures were crystalline, spherical and average size of 19 nm.
- Copper ferrite were prepared by environmentally friendly process from fuel.
- The process of the oxygen vacancies/valence/conduction band was studied.

GRAPHICAL ABSTRACT

Photoluminescence spectra of (a) $CuFe_2O_4$-sample A prepared by microwave method (b) $CuFe_2O_4$-sample B prepared by sol–gel method.



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ABSTRACT

$CuFe_2O_4$ nanocrystals were synthesized by the sol–gel method (SGM) and microwave method (MM) by using sucrose as a fuel. The structural, morphological, optical and magnetic properties of the products were determined and characterized in detail by X-ray diffraction (XRD), high resolution scanning electron microscopy (HR-SEM), photoluminescence (PL) spectroscopy and vibrating sample magnetometer (VSM). The XRD results confirmed the formation of cubic phase $CuFe_2O_4$. The formation of $CuFe_2O_4$ nano and microstructures were confirmed by HR-SEM. Photoluminescence emissions were determined by PL spectra, respectively. The relatively high saturation magnetization (78.22 emu/g) of $CuFe_2O_4$-MM shows that it is ferromagnetic and low saturation magnetization (35.98 emu/g) of $CuFe_2O_4$O-SGM confirms the super paramagnetic behavior.

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1. Introduction

Spinel ferrites have attracted excessive attention because of their shape, size, and structure of the materials have great inspirations on their chemical and physical properties when the dimension is reduced to the nanometer scale, nanostructured

* Corresponding author.
E-mail addresses: genuineraja@gmail.com, genuineraja2015@gmail.com (G. Raja).

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Effect of glycine and L-arginine as processing fuels in the synthesis of $ZnFe_2O_4$ nanostructures prepared via a facile microwave combustion method

G. Raja [a,*], S. Gopinath [b,c], K. Sivakumar [d]

[a] Department of Chemistry, Paavai Engineering College (Autonomous), Pachal (Post), Namakkal 637018, Tamil Nadu, India
[b] Research and Development centre, Bharathiar University, Coimbatore 641046, India
[c] Department of Chemistry, Chettinad College of Engineering & Technology, Karur 639114, Tamil Nadu, India
[d] Department of Chemistry, Adhiyamaan College of Engineering, Hosur 635109, Tamil Nadu, India

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ABSTRACT

One-pot syntheses of size and shape controlled spinel ferrite, $CuFe_2O_4$ nanocrystals (NCs) larger than 20 nm in size are achieved by the microwave combustion method. Two different fuels, glycine and L-arginine, along with metal nitrates have been used to prepare nanophase ferrites powder. This usually occurs when size of nanostructures (nanoparticles) becomes comparable with a characteristic nanoscale factor (path length, scattering, acoustics, optical and spin waves, and others). A facile cost-effective microwave combustion method to syntheised $ZnFe_2O_4$ nanocrystals has been developed. The morphology, structure and optical properties of the samples were characterized by employing X-ray powder diffraction, transmission electron microscopy, scanning electronic microscopy and optical properties measurements. Magnetic properties of the product were investigated using vibrating sample magnetometer. The particle size obtained from TEM, the crystallite size calculated from XRD and the magnetic domain size estimated from magnetization measurements are all in good agreement, manifesting the significant role of the confinement in the growth and fabrication of crystalline, single magnetic domain, nanoparticles with super-paramagnetic behavior at room temperature. Results demonstrate that magnetic properties of the as-prepared samples can largely be modified just by manipulating the particle size. The results obtained would be useful to design desired novel magnetic materials.

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1. Introduction

Spinel ferrites have witnessed excessive consideration by the research community through the globe since their shape, size and structure have a great influence on the chemical and the physical properties when reduced to the nanometer scale. The nanomaterials show exceptional optical, electrical, magnetic and catalytic properties compared to that of the bulk counterpart [1]. Magnetic nanoparticles have many technological applications including magnetic data storage, ferro fluids, medical imaging, drug targeting, biomedicine and catalysis [2–4]. Therefore, the composition, crystalline size, surface morphology and structure of oxide semiconductors play a vital role in influencing the optical properties.

In general, the spinel ferrites can be denoted by the formula AB_2O_4, where A and B represent divalent and the trivalent cations, respectively. The exceptional magnetically directing nature of zinc ferrite is due to the fact that the divalent cation A (Zn^{2+}) and the trivalent cation B (Fe^{3+}) are dispersed at both the tetrahedral (A -sites) and the octahedral (B -sites) coordination sites, however retaining the basic crystal structure [5].

Therefore, the development of a synthesis technique by the nanosized materials are produced with superior magnetic performance compared to that of bulk materials is desired. Different methods are available for the synthesis methods have been applied for $ZnFe_2O_4$, such as, co-precipitation, sol–gel, hydrothermal, solvothermal, thermal decomposition and microwave combustion methods [6,7].

This method depends on exploiting the combustion reaction enthalpy by the rapidly heating the aqueous solution containing the precursor metal nitrates, oxidizing agents and various nitrogen containing organic compounds that the act as reducing agents and fuels. The extreme exothermic property of the reaction ensures self-propagating combustion process. Moreover, under certain conditions the temperature released during the reaction is

* Corresponding author.
E-mail addresses: genuineraja@gmail.com, genuineraja2015@gmail.com (G. Raja).

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A STUDY ON FACTORS AFFECTING THE EXPORT PERFORMANCE OF HOME TEXTILE INDUSTRY IN KARUR DISTRICT

Dr. M. Gurusamy

Associate Professor, Department of Management Studies, Paavai Engineering College, Pachal, Namakkal, India.
Email: gurusamyphd@yahoo.com

Abstract— *The Indian textile industry is one of the largest industries in the world with a massive raw material and textiles manufacturing base. Our economy is mainly depending on the textile manufacturing and trade in addition to other major industries. Textile Industry in India is the second largest employment generator after agriculture. The home textile products are bed linen, kitchen linen, toilet linen, table linen, curtains, and furnishing articles etc. Karur home textile industry is playing a vital role in boosting the economy of the country, how sustainable is the industry with a potential competition. It has been observed that Karur home textile industry is in same line with Cambodia, Singapore, Malaysia and Philippines, where the low cost labour is the comparative advantage. Therefore, this study examines factors affecting export performance of home textile products in Karur District with regard to firm characteristic factors, firm competency factors, economic factors, market factors and contextual environment factors. The sampling of this study is the home textile products exporting companies in Karur District. Stratified random sampling plan was adopted for selecting the home textile products exporters (mainly three types – large, medium and small) within the cluster. The sample size of this study is 254. A structured questionnaire was developed to collect data from the home textile export units who are involving in the international marketing of textile products. Structural Equation Modeling and Path Analysis are used to analysis of research data. The hypothesis related to impact of factors like Firm Characteristics, Firm Competency, Economic Factor, Market Factor and Contextual Environmental Factor leads to the export performance. The firm competency factor of the firm is the only dimension having a positive sign on the mediating dimension of economic factor leads to positive impact (0.578) on overall export performance. Based on the GFI and CFI indices, it can be concluded that there is a relatively good fit between the model and data. Correlation between the structural paths in the mediation model indicates a degree of less multicollinearity and positive relationship between the items supposed to be measuring different constructs and dimensions.*

Keywords— *Firm Characteristics, Firm Competency, Economic Factor, Market Factor and Contextual Environmental Factor*

INTRODUCTION

The Indian textile industry is one of the largest industries in the world with a massive raw material and textiles manufacturing base. Our economy is mainly depending on the textile manufacturing and trade in addition to other major industries. About 27 percentage of the foreign exchange earnings are on account of export of textiles and clothing alone. The textiles and clothing sector contributes about 14 percentage to the industrial production and 3 percentage to the gross domestic product of the country. Around 8 percentage of the total excise revenue collection is contributed by the textile industry. The textile industry accounts for a large i.e., 21 percentage of the total employment generated in the economy. Around 35 million people are directly employed in the textile manufacturing activities. Indirect employment including the manpower engaged in agricultural based raw-material production like cotton and related trade and handling could be stated to be around another 60 million.

HOME TEXTILE INDUSTRY IN INDIA

Textile Industry in India is the second largest employment generator after agriculture. It holds significant status in India as it provides one of the most fundamental necessities of the people. Home is the place where you spend the most of your time. So a lot of care and effort is needed while decorating or furnishing your home. Home furnishings don't have to be an expensive endeavour as there are various inexpensive and attractive items are available that can make your home very beautiful and attractive. Couches, chairs, roll top desks, lamps, etc. and many more items are here for your home furnishing. There are various different materials used to give the desired effect and look to your home. Home textiles are available in various colours, materials and textures. There is hand printed and special creations made from chiffon, embroidered fabrics with lace. Synthetic material is appropriate for kitchen as it is easier to clean. The utility