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(57) Abstract :
Accurate detection of plant diseases is essential for maintaining global food security and promoting sustainable agricultural practices. This article offers an in-depth examination of employing machine learning, particularly Convolutional Neural Networks (CNNs), for precise and prompt classification of plant diseases. The study investigates the amalgamation of varied datasets, pre-processing methodologies, and CNN architecture to develop a resilient disease detection model. The dataset, which includes diverse crops and diseases, serves as the basis for model training, while pre-processing guarantees optimal data quality. The CNN architecture, carefully constructed, advances through convolutional and pooling layers to extract hierarchical features from input images. The trained model attains an accuracy of 92.23% in disease classification, demonstrating the promise of this technology in agricultural advancement. The article emphasizes the crucial significance of machine learning in transforming

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