

Multi-Disease Detection in Paddy and Jackfruit Plants Using Image Processing Techniques

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Abstract

Plant diseases pose a major threat to agricultural productivity, particularly in staple crops such as paddy and fruit crops like jackfruit. Early and accurate disease detection is critical for ensuring food security and minimizing economic losses. This study proposes an image-processing-based system for the multi-disease detection of paddy and jackfruit plants. Initially, Convolutional Neural Networks (CNNs) were employed to classify disease categories, achieving a limited accuracy of approximately 45%, highlighting the challenges of training deep models with small datasets. To enhance performance, further experiments are planned using MobileNetV2, a transfer learning architecture well-suited for limited data scenarios. The study emphasizes image preprocessing to reduce noise, effective feature extraction, and rigorous evaluation of classification performance. Expected outcomes include improved disease detection accuracy, a comparative analysis of CNN and MobileNetV2 performance, and the development of a scalable framework that can be extended to other agricultural crops.

Keywords: Plant disease detection, CNN, MobileNetV2, Paddy, Jackfruit