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Cashew Diseases Classification using Concatenate of Models

Anand Kumar Jain
Department CSE MNIT Jaipur, India

Neeta Nain
Department CSE MNIT Jaipur, India

Abstract:

This paper introduces a novel deep learning-based approach for cashew leaf disease classification using a MobileNet-VGG19 concatenate model trained on the CCMT cashew disease dataset. Identifying cashew leaf diseases is challenging due to variations in texture, color, and structural patterns. To address these challenges, we propose a hybrid model that leverages the efficiency of MobileNet for lightweight feature extraction and the deep representational power of VGG19 for detailed feature analysis. By integrating these architectures, our approach achieves an optimal balance between computational efficiency and feature richness. Extensive experiments demonstrate that the proposed model surpasses individual architectures, achieving a test accuracy of 96.23%, training accuracy of 98.20%, precision of 96%, recall of 95%, and an F1-score of 96%. Furthermore, the model exhibits enhanced robustness, making it highly suitable for real-world applications in precision agriculture and automated disease management. The findings highlight the potential of deep learning in improving plant disease diagnosis, ultimately contributing to sustainable and technology-driven agricultural practices.

Keywords:

Cashew, Agriculture, Plant, Disease, Leaf, MobileNet-VGG19 Con.