IDENTIFYING RICE PLANT DISEASES USING CONVOLUTIONAL NEURAL NETWORK ALGORITHM BASED ON LEAF IMAGES WITH RESNET-101 MODEL

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ABSTRACT

Diseases in rice plants are among the major factors contributing to reduced productivity and crop quality. If not managed properly, they can result in significant economic losses for farmers. Early detection is crucial, yet manual identification by experts is time-consuming and prone to human error. To address this issue, this study proposes the application of a Convolutional Neural Network (CNN) with the ResNet-101 architecture to automatically classify rice plant diseases based on leaf images. The research steps include data collection of rice leaf images, data preprocessing, dataset splitting, CNN model training, model evaluation, and web-based system implementation. The experimental results show that the ResNet-101 CNN model achieved a validation accuracy of 76.05% in classifying four rice leaf conditions (healthy, brown spot, leaf blast, hispa). This system is expected to assist farmers in early and accurate disease detection, enabling timely preventive and corrective actions.

Keywords*: Rice Plant Diseases, Convolutional Neural Network, ResNet-101, Image Classification, Early Detection.*