IMPLEMENTING CONVOLUTIONAL NEURAL NETWORK (CNN) FOR CLASSIFYING DISEASE TYPES IN CHILI PLANTS

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ABSTRACT

Chilli plants hold significant economic value due to their increasing demand. However, their production is frequently threatened by pests and diseases. Consequently, a classification system for chilli plant diseases utilizing Convolutional Neural Networks (CNNs) is essential. This study compares four CNN architectures: Vanilla CNN, VGG16, ResNet50, and DenseNet201. The dataset comprises 500 images, which are divided into training, validation, and test sets. All four architectures were evaluated using identical parameters, including learning rate, batch size, and number of epochs, and received similar treatment during the training process. The results revealed varying levels of accuracy among the architectures. The Vanilla CNN achieved an accuracy of 0.7775 with a validation accuracy of 0.7200. The VGG16 architecture attained an accuracy of 0.9425 and a validation accuracy of 0.7200. In contrast, the ResNet50 architecture recorded an accuracy of 0.4175 and a validation accuracy of 0.4000. The highest accuracy was obtained using the DenseNet201 architecture, with an accuracy reaching 0.8325 and the highest accuracy validation at 0.9000. Consequently, DenseNet201 demonstrates optimal performance in the classification of chilli plant diseases through the utilization of CNN.

***Keywords**: Chili Plants, Disease Classification, Convolutional Neural Network (CNN), DenseNet201, Vanilla CNN, VGG16, ResNet50*