

Identification of Plant Leaf Disease by CNN Learning Techniques

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Abstract: *Plant diseases are one of the most important factors that seriously threaten agricultural production. These diseases on plants lead to a significant reduction in both the quality and quantity of agricultural products. Hence, Early detection and identification of these diseases can effectively reduce the agricultural and economic losses. Detection of these diseases depended on manpower; however, automatic detection of diseases has been advanced to reduce human efforts and errors. In this paper, plant leaf images are used to detect the diseases present. This is done by using images of plant leaves with disease and studying the visually observable patterns in the images. This study uses various image processing techniques to detect and classify the disease. The proposed model uses Contrast stretching to enhance the contrast in an image to improve image quality. The model Converts the RGB image to a grayscale image. Filters (Gaussian, canny edge detector, median) are used to pre-process and enhance the images. Image segmentation is done with the help of K-Means clustering. Feature extractions using algorithms such as Discrete wavelet transform, Principal component analysis, and grey level co-occurrence matrix are used to extract the informative features of the images and for image classification, a CNN classifier is applied.*

Keywords: Plant Disease, Discrete Wavelet Transform, Principal Component Analysis, Grey Level Co-occurrence Matrix, CNN Classifier, K-Means Clustering, Gaussian, Canny Edge Detector, Median Filters, Feature Extraction, etc.

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