Papaya Plant Leaf Disease Detection Using Machine Learning

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Abstract- Production of papayas, one of the most popular tropical fruit crops, is significantly decreased by a variety of leaf diseases, especially Anthracnose, Leaf Curl, and Papaya Ringspot Virus. Decreasing crop loss and boosting production depend on early detection of these diseases. Farmers' traditional manual checks might be unreliable and time-consuming. Machine learning using AI can be used to automatically categorize plant diseases from leaf images. Several machine learning techniques for leaf disease in papaya plant are compared in this research work. A wide range of models, such as CNN, Random Forest, KNN, SVM, ANN are studied and related using performance criteria like accurateness, recall, correctness and F1- score. According to results of experiments, CNN- based models and additional deep learning methods perform more correctly than ancient machine learning techniques. The suggested comparative study offers recommendations for choosing appropriate algorithms for automated systems that detect papaya leaf disease.

This study analyzes different machine learning techniques to identify papaya leaf disease. CNN models are evaluated on an image dataset using Random Forest, SVM, K-Nearest Neighbor, and other traditional machine learning methods. CNN had the maximum classification precision, according to the outcomes of the study.

Keywords: Papaya Plant Leaf Detection, Machine Learning, Random Forest, SVM, K-Nearest Neighbors.

I. Introduction - A lot of developing countries rely heavily on agriculture for their economies. Papaya (Carica papaya) is a major fruit harvest that is widely grownup in humid and subtropical regions. However, plant diseases significantly affect both the number and quality of papaya crops. Early illness detection and diagnosis enable farmers to take appropriate preventive measures.

Experts have traditionally used eye inspection to identify plant diseases, which is laborious and more vulnerable to human mistake. Because of developments in computer vision and machine learning automated systems are able to analyze leaf pictures and identify disease patterns. Recent studies have shown that the accuracy of identifying plant illnesses can be significantly increased by employing artificial intelligence techniques to analyze image data obtained from plant leaves. Machine learning algorithms based on leaf image datasets may effectively classify healthy and sick leaves.

The key goal line of this study remains to compare different machine learning approaches for finding diseases on papaya plant leaves.