

# Prediction of Plant Leaf Diseases using Drone and Image Processing Techniques

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**Abstract:** *Plant diseases are one of the major threats to global food production. Efficient monitoring and detection of plant pathogens are instrumental in restricting and effectively managing the spread of the disease and reducing the cost of pesticides. Traditional, molecular, and serological methods that are widely used for plant disease detection are often ineffective if not applied during the initial stages of pathogenesis, when no or very weak symptoms appear. Moreover, they are almost useless in acquiring spatialized diagnostic results on plant diseases. On the other hand, remote sensing (RS) techniques utilizing drones are very effective for the rapid identification of plant diseases in their early stages. Currently, drones, play a pivotal role in the monitoring of plant pathogen spread, detection, and diagnosis to ensure crops' health status. The advantages of drone technology include high spatial resolution (as several sensors are carried aboard), high efficiency, usage flexibility, and more significantly, quick detection of plant diseases across a large area with low cost, reliability, and provision of high-resolution data. Drone technology employs an automated procedure that begins with gathering images of diseased plants using various sensors and cameras. After extracting features, image processing approaches use the appropriate traditional machine learning or deep learning algorithms. Features are extracted from images of leaves using edge detection and histogram equalization methods. Drones have many potential uses in agriculture, including reducing manual labor and increasing productivity. Drones may be able to provide early warning of plant diseases, allowing farmers to prevent costly crop failures.*

**Keywords:** Plant health monitoring, Remote sensing, Sensor networks, Agricultural monitoring, Spectral analysis

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