

Project Title: Automated Early Detection of Crop Disease Using Drone-Based Hyperspectral Imagery

Abstract: Current methods for detecting crop diseases are often reactive, relying on visible symptoms that appear late in the infection cycle, leading to significant yield loss. This proposal outlines a novel, proactive system for the early detection of common agricultural diseases before visible symptoms manifest.

Our proposed solution leverages autonomous drones equipped with hyperspectral imaging sensors to capture detailed data from crop fields. We will develop a machine learning model, specifically a Convolutional Neural Network (CNN), to analyze these hyperspectral signatures. The model will be trained to identify the unique spectral changes in plants that are under stress from specific pathogens.

The project's feasibility is supported by a three-phase plan: data acquisition, model development, and field validation. Successful implementation will provide farmers with a powerful tool for early intervention, reducing crop loss and minimizing pesticide use.