**Leaf Disease Detection (GUI-based Deep Learning)**

Abstract:

This project implements an AI-powered Leaf Disease Detection System with a user-friendly Graphical User Interface (GUI) built using Tkinter. The system leverages a pre-trained Convolutional Neural Network (CNN) model to classify leaf images into different disease categories such as Powdery Mildew, Downy Mildew, Bacterial Blight, Rust, and Healthy Leaves.

The user can upload an image of a leaf, and the model processes it to predict the disease along with a confidence score. The GUI provides a seamless experience by displaying the uploaded image and predicted results. This tool is crucial for early disease detection in plants, enabling farmers and agricultural experts to take timely actions, thereby reducing crop losses and enhancing yield.

Prerequisites:

* Python (for scripting)
* TensorFlow/Keras (for deep learning model)
* Tkinter (for GUI development)
* PIL (Pillow) (for image handling in the GUI)
* NumPy (for numerical computations)
* Pre-trained CNN Model (trained on a leaf disease dataset)
* Matplotlib/Seaborn (optional, for visualizing dataset statistics)