

Plant Disease Prediction

A Smart Approach to Modern Agriculture

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Introduction to Plant Disease Prediction



Agriculture

Foundation for global economies and livelihoods.



Impact of Diseases

Crop losses deeply affect farmers' income.



Early Detection

Timely intervention prevents widespread damage.



AI-Based Detection

Accurate analysis through leaf image processing.

Market Survey Highlights

Market Size

Global agri-tech to exceed \$22B by 2025

Crop Loss

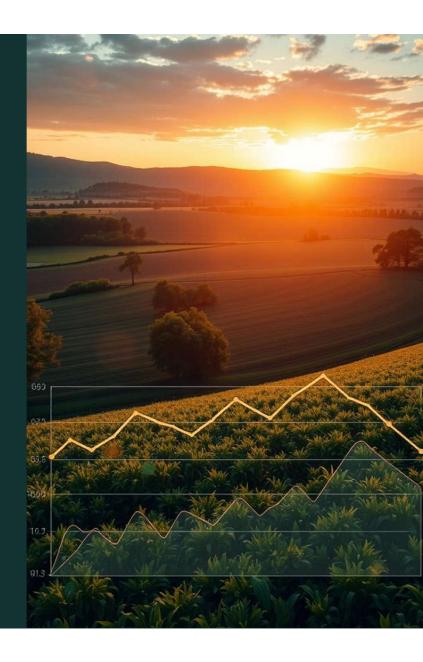
30-40% loss globally due to diseases

Demand

Growing need for smart farming tools

Farmer Needs

Fast, affordable, accurate detection





Proposed Solution Overview



CNN Model

Image-based disease classification



FastAPI Backend

Prediction and advice API (using Gemini)



React Frontend

Interactive and responsive UI



Weather Integration

Holistic plant health support

Project Phases

Requirement Analysis

User needs & disease types

Data Collection

2

Leaf image datasets from PlantVillage

Model Building

Custom CNN training

3

4

5

6

Backend Development

API with FastAPI

Frontend Development
React UI, Image Upload

Testing & Deployment(If required)

Dockerized, cloud ready

Model Architecture & Backend

CNN Model Details

- Input: RGB leaf images (resized)
- Conv + ReLU + MaxPooling layers
- · Dense & Dropout for regularization
- · Output: Softmax disease prediction
- Accuracy: -95%

FastAPI Backend

- · Processes images, normalization
- · Runs CNN for predictions
- · Uses GPT for mitigation advice
- · Returns prediction & confidence JSON

Frontend Features

React + Bootstrap

Elegant and responsive design

Image Upload

Preview and process leaf images

Loading Spinner

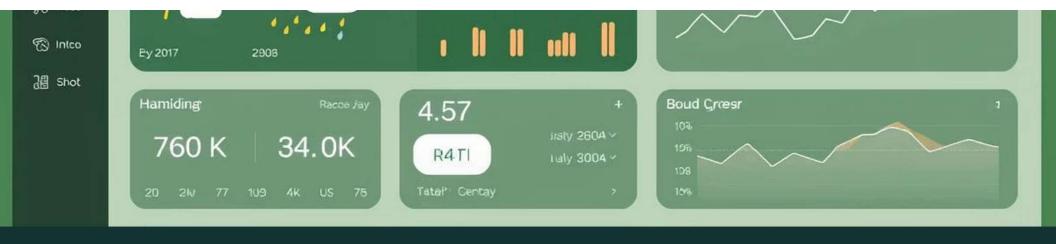
Animated predictor feedback

Weather Widget

Live climate data integration

GPT Chat Advice

Natural-language disease guidance



Additional Features

Weather-based Forecast
Proactive Plant Health Insights

Environmental Data

Rainfall, humidity, wind speed displayed

Responsive UI

Supports Dark Mode for Usability

5-day Forecast

Short-term climate outlook

Technology Stack



Frontend: React & Bootstrap

Interactive user interface built with React and styled with Bootstrap.



Backend: FastAPI with Python

High-performance API built with FastAPI for handling predictions.



Model: TensorFlow/Keras CNN

Convolutional Neural Network trained with TensorFlow/Keras for image analysis.



AI Integration: Gemini/GPT API

Natural language processing via Gemini/GPT API for intelligent advice.



Weather: OpenWeatherMap API

Real-time weather data integration using OpenWeatherMap API.



Future Scope

Expand Crop/Disease Support

Broader plant coverage

SMS Integration

Direct farmer notifications

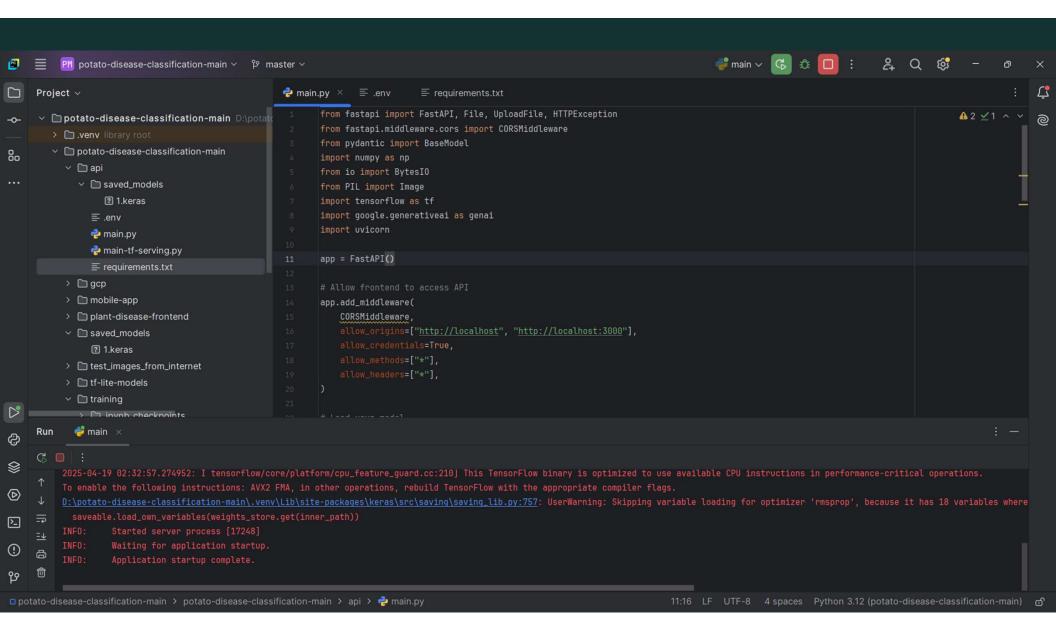
Mobile Real-time App

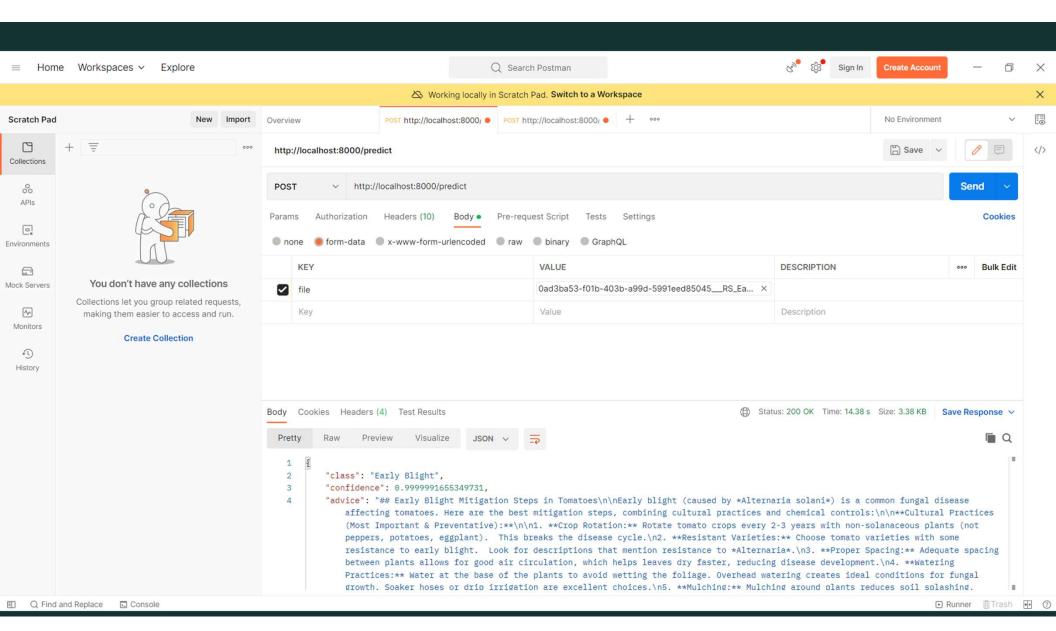
Camera capture and instant prediction

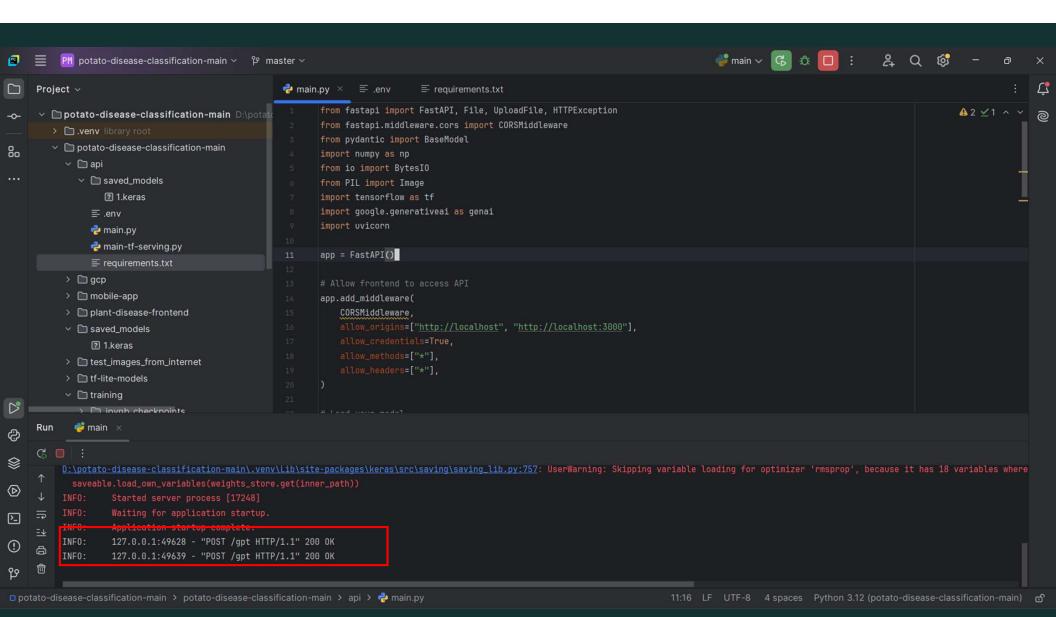
Satellite & IoT Sensors

Enhanced data for precision monitoring

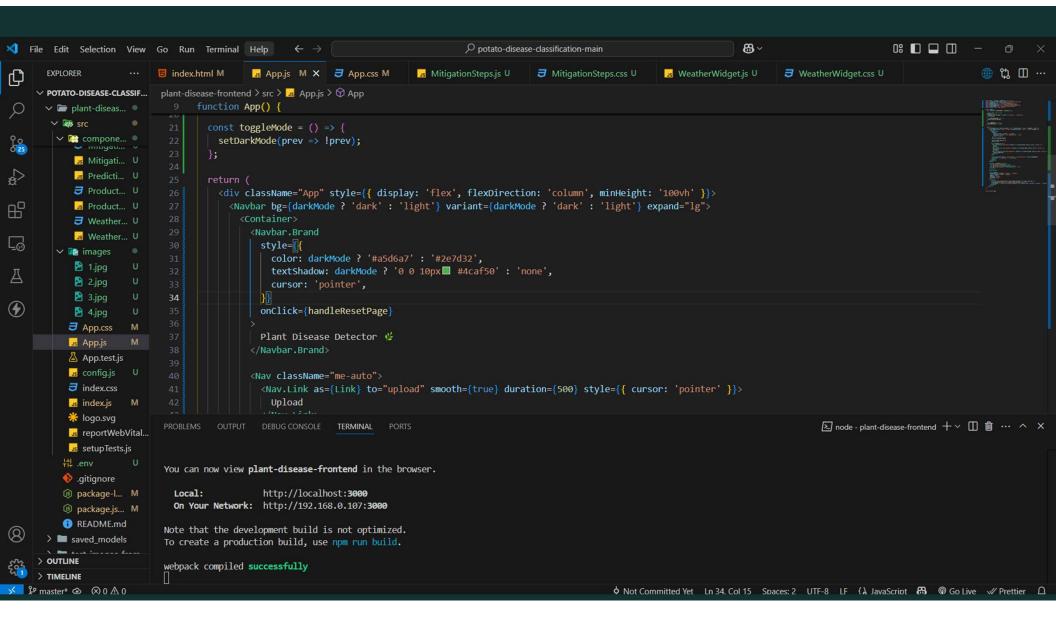


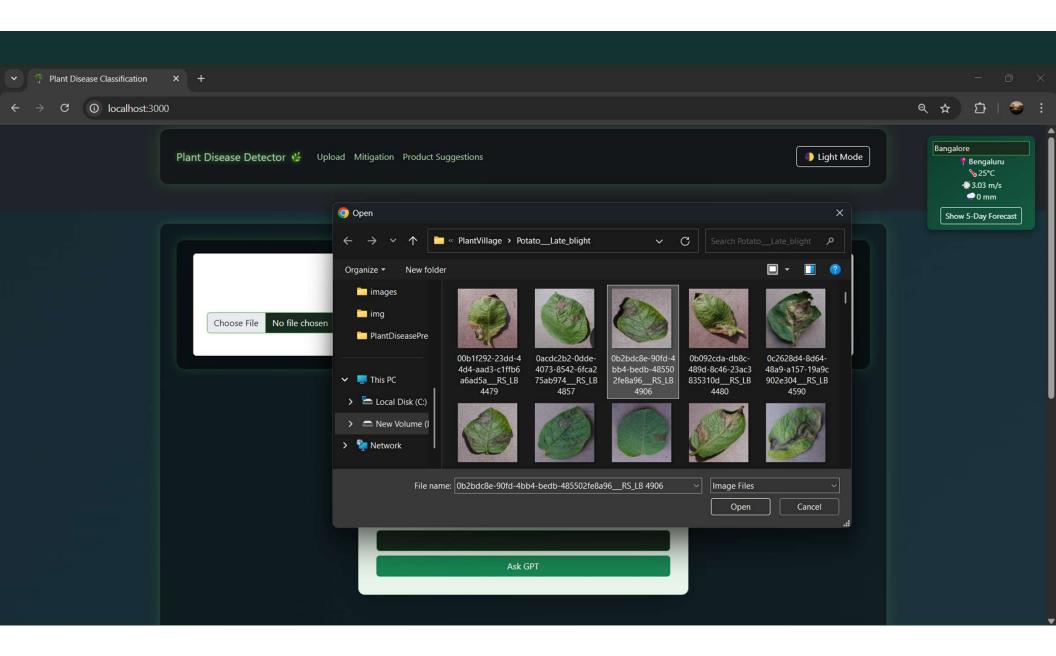


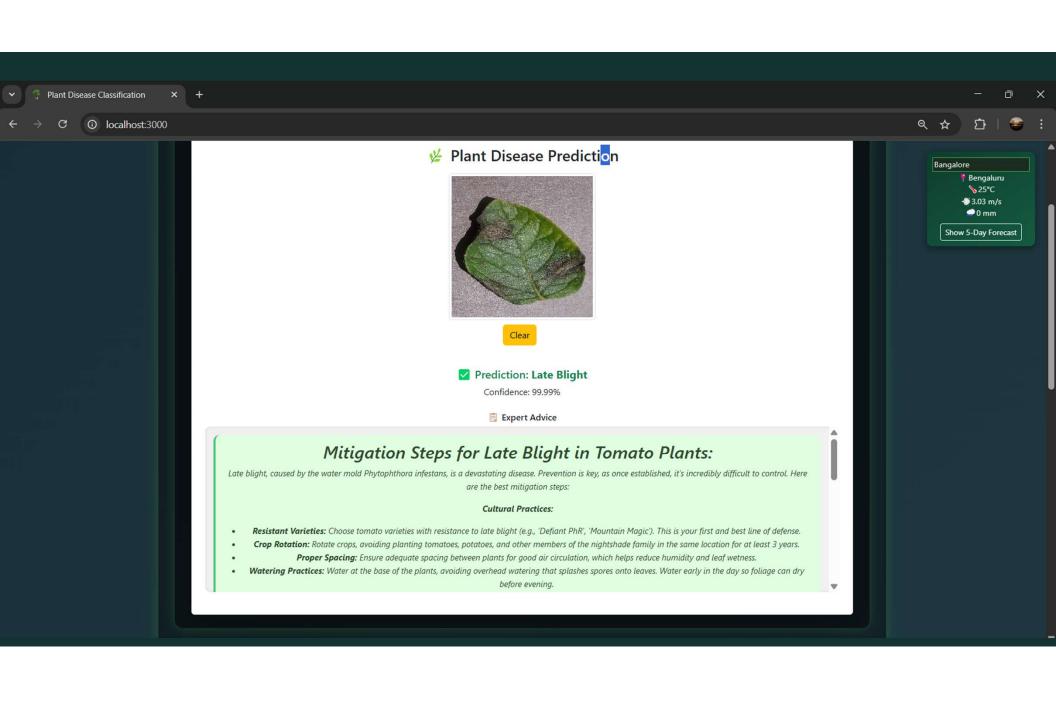


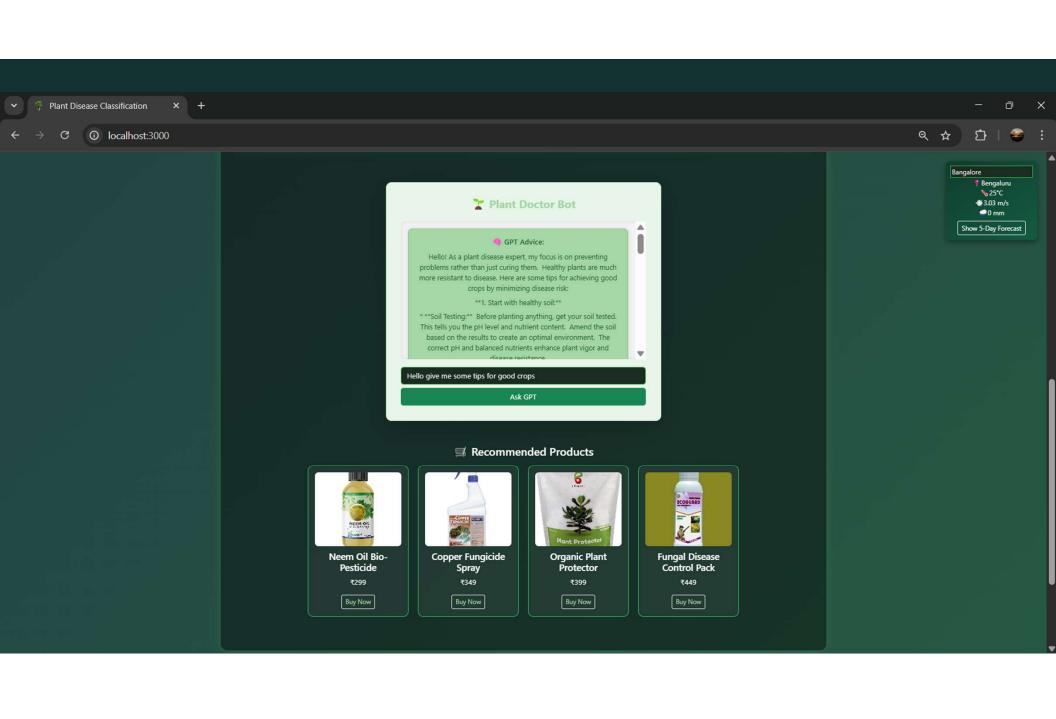












Thank You!

We appreciate your time and interest in our project.

For questions or collaboration, please reach out via email or GitHub.

1 Questions?

We welcome your inquiries and feedback.

2 Contact

Email: kamilperwez@gmail.com

GitHub

Explore code & updates at github.com/kamilperwez