CropCare — Plant Disease Prediction & CropCare Platform

By

1. Aarya Patil UCE2023653
2. Riya Nalmwar UCE2024020
3. Snehal Jagtap UCE2024023

Problem Statement

- Small farmers face crop losses due to late or wrong disease diagnosis.
- Lack of accessible tools for quick detection in rural areas.
- Chemical misuse due to poor recommendations harms soil and yield.
- Visiting agricultural experts is time-consuming, expensive, or not available in rural regions.

Objectives

- Build a smart AI-based web application that predicts plant diseases from uploaded images.
- Provide clear, farmer-friendly guidance: disease name, symptoms, precautions, organic and chemical treatment options.
- Provide dos and don’ts for safe pesticide use.
- Maintain a supplement marketplace with fertilizers, nutrients, and plant-care products.

Features

- Instant disease prediction from leaf images using a trained CNN model.
- Detailed disease report including: symptoms, causes, prevention, and treatment.
- Healthy vs. Diseased detection to avoid false alarms.
- Supplement/Product suggestions tailored to the disease.
- User-friendly interface designed for students, farmers, and agriculture workers.

System Architecture

Components:

- Frontend: HTML-CSS
- Backend: Flask
- Model server: TensorFlow ,PyTorch saved model
- Database: PlantVillage
- Hosting: Local

Methodology

Data Preprocessing

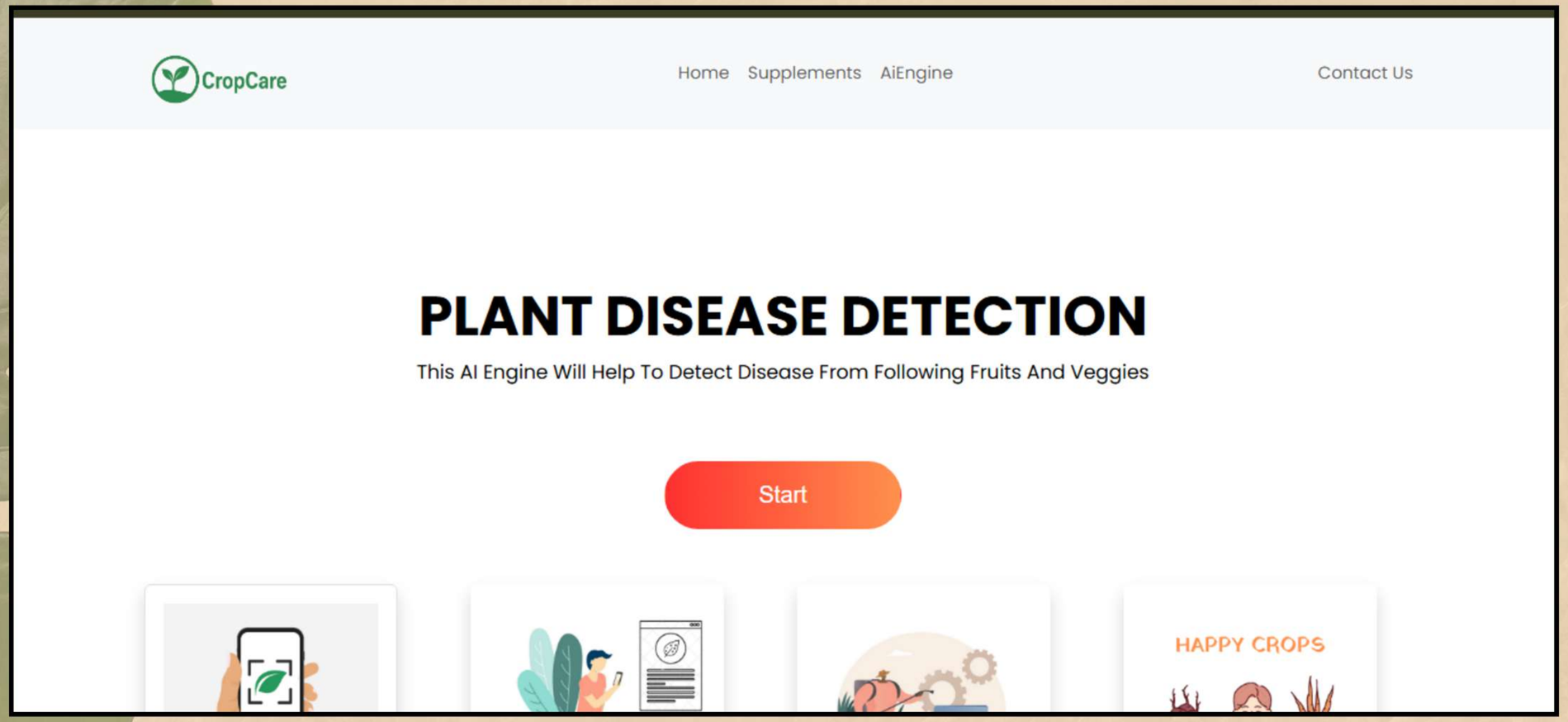
- Before giving images to the model, they must be cleaned.
- Steps
- Resizing all images to a fixed size (e.g., 224×224)
- Normalization (scale pixel values between 0–1)
- Noise removal using filters
- Data augmentation to increase dataset size:

1. Rotation
2. Flipping
3. Cropping
4. Brightness/contrast adjustment

Output

Home Page

- Steps to demo:
- Open app
- Upload leaf image
- Wait for model inference
- Show report and recommended products



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Detect Disease

Why is it necessary to detect disease in plant ?

Plant diseases affect the growth of their respective species. In addition, some research gaps are identified from which to obtain greater transparency for detecting diseases in plants, even before their symptoms appear clearly. diagnosis is one of the most important aspects of a plant pathologist's training. Without proper identification of the disease and the disease-causing agent, disease control measures can be a waste of time and money and can lead to further plant losses. Proper disease diagnosis is necessary.

Simply upload your plant's leaf image and then see the magic of AI.

Choose File t2.jpg

Submit

Image upload

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Tomato : Septoria Leaf Spot

Brief Descritpion :

Septoria leaf spot is caused by a fungus, Septoria lycopersici. It is one of the most destructive diseases of tomato foliage and is particularly severe in areas where wet, humid weather persists for extended periods.Septoria leaf spot usually appears on the lower leaves after the first fruit sets. Spots are circular, about 1/16 to 1/4 inch in diameter with dark brown margins and tan to gray centers with small black fruiting structures. Characteristically, there are many spots per leaf. This disease spreads upwards from oldest to youngest growth. If leaf lesions are numerous, the leaves turn slightly yellow, then brown, and then wither. Fruit infection is rare.

Prevent This Plant Disease By follow below steps :

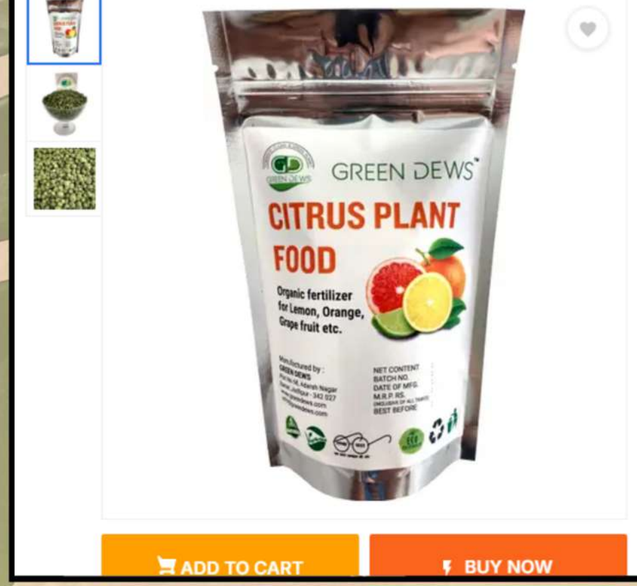
Remove diseased leaves. Improve air circulation around the plants. Mulch around the base of the plants. Mulching will reduce splashing soil, which may contain fungal spores associated with debris. Apply mulch after the soil has warmed. Do not use overhead watering. Overhead watering facilitates infection and spreads the disease. Use a soaker hose at the base of the plant to keep the foliage dry. Water early in the day. Control weeds. Nightshade and horsenettle are frequently hosts of Septoria leaf spot and should be eradicated around the garden site. Use crop rotation. Next year do not plant tomatoes back in the same location where diseased tomatoes grew. Wait 1–2 years before replanting tomatoes in these areas. Use fungicidal sprays.

Supplements :

Roko Fungicide

Buy Product

Supplements



Model Training

Process

- Dataset split:
  - 70% Training
  - 20% Validation
  - 10% Testing
- Hyperparameter tuning:
  - Learning rate
  - Batch size
  - Epochs
- Loss function: Categorical Cross Entropy
- Optimizer: Adam

Output

The model learns:

- Patterns on leaves
- Disease symptoms
- Differences between healthy and infected leaves

Conclusion

- CropCare is designed to support farmers, students, and agricultural workers by providing fast, accurate, and easy-to-understand plant disease diagnosis.
- It bridges the gap between technology and agriculture, giving users a reliable tool for early detection of plant diseases.
- By using AI-powered image prediction, CropCare helps reduce crop losses that happen due to late identification or incorrect diagnosis.
- The system also prevents misuse of chemical pesticides by giving proper treatment steps, including organic and safe alternatives.

Thank You