



TEAM DEFENDERS

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Slogan-

PROBLEM STATEMENT



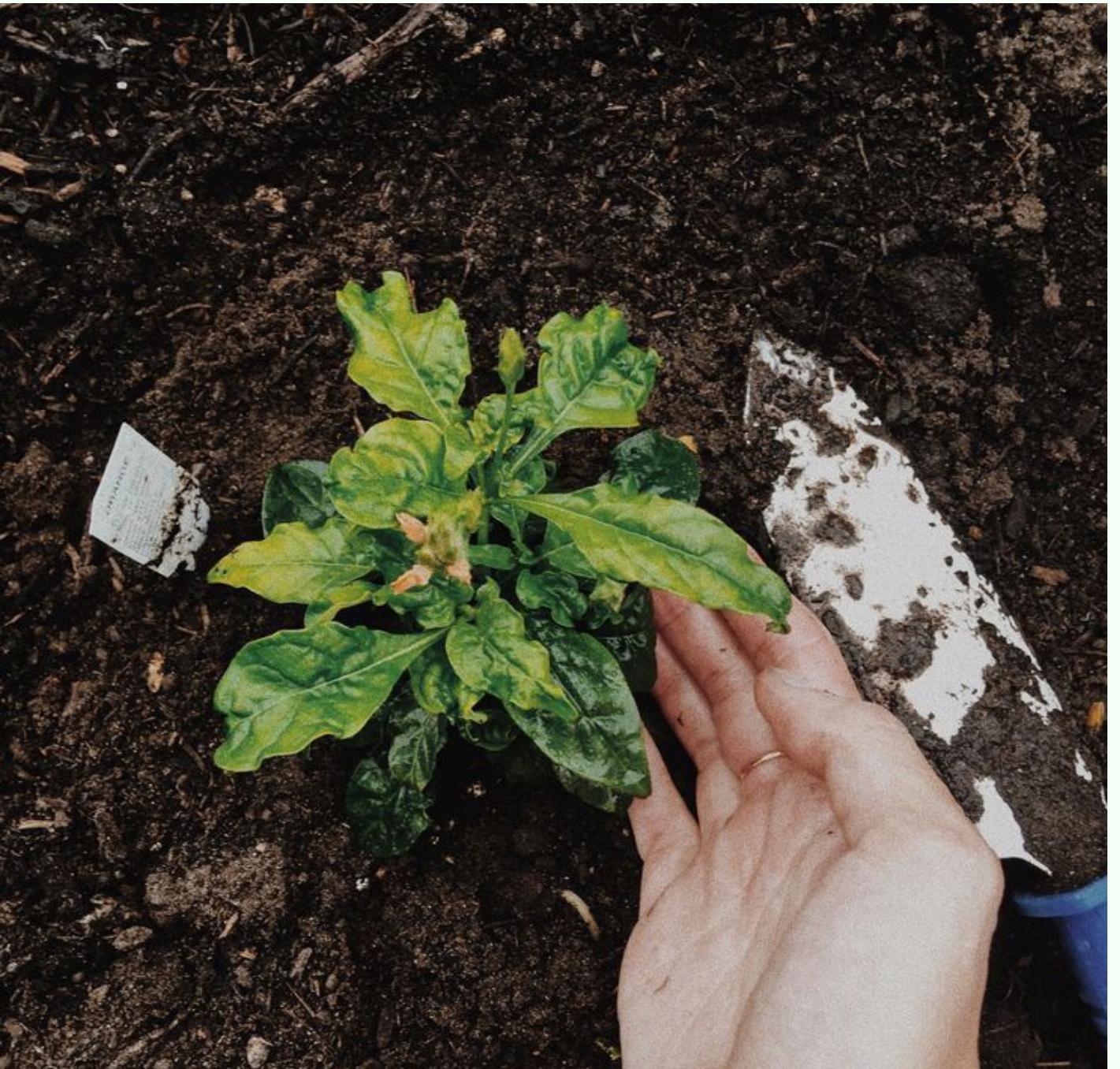
Description:

Plant diseases reduce agricultural yield, impact food security, and increase pesticide misuse.

Small-scale farmers and home gardeners often struggle to identify plant diseases accurately.

Manual diagnosis is time-consuming and error-prone.

Objective: Build a deep learning-based system that can identify plant diseases from leaf images and provide intelligent, real-time treatment recommendations.



What we can put on the table....



Our solution:

- Automated plant disease detection from leaf images
- Fast and accurate diagnosis
- Accessible through a simple web interface

Objective

- Build a CNN-based deep learning model (PyTorch)
- Deploy via Flask backend + Web UI
- Provide real-time disease prediction with confidence score
- Help in early treatment → reduce crop loss

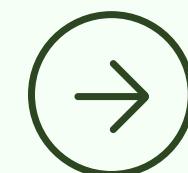
PROPOSED SOLUTION



SDG'S GOALS WE ALIGN WITH

- SDG 2: Zero Hunger → Healthy crops = better food security
- SDG 3: Good Health & Well-being → Prevent harmful pesticide misuse
- SDG 8: Decent Work & Economic Growth → Higher yield = higher farmer income

- SDG 9: Industry, Innovation & Infrastructure → AI-driven smart farming
- SDG 12: Responsible Consumption & Production → Reduced farm wastage
- SDG 13: Climate Action → Sustainable farming, less environmental damage



KEY FEATURES



- User-friendly Web Interface (HTML, CSS, JS).
- Flask-powered API for predictions.
- PyTorch-trained deep learning model.
- Disease + Confidence Score.

- Early-stage disease detection can reduce crop loss by up to 40%
- CNNs outperform traditional ML in leaf disease classification
- PlantVillage dataset: 54,000+ images, 14 crops, 26 diseases
- Transfer Learning (ResNet / EfficientNet) boosts accuracy on small datasets

METHODOLOGY

- **Data Collection** → PlantVillage dataset & field images
- **Preprocessing** → Resize, augmentation (flip, crop, brightness)

- **Model Training** → Transfer Learning (ResNet / EfficientNet)
- **Evaluation** → Accuracy, Precision, Recall, F1-score

- **Deployment** → Flask backend + Web UI
- **Prediction** → Upload leaf → Model outputs disease + confidence



FUTURE SCOPE AND USE

Deforestation

Large-scale tree removal disrupts ecosystems, reduces biodiversity, and contributes to climate change by decreasing carbon absorption and altering habitats.

Pollution

Air, water, and soil pollution harm wildlife, poison ecosystems, and degrade natural resources essential for survival.

Climate Change

Rising temperatures, extreme weather, and melting ice caps threaten ecosystems, causing habitat loss and endangering species worldwide.

Overexploitation

Excessive hunting, fishing, and resource extraction deplete nature's reserves, endangering species and disturbing ecological stability.



TECH STACK USED



Front-End → HTML,CSS,JAVASCRIPT
Back-end → Python , Flask
Machine-Learning Model → Deep Learning ,Pytorch

Used multiple Dataset to train Model->
PlantVillage Dataset
<https://share.google/1AXexijYoxNtFSxWo>
New Plant Diseases Dataset
<https://share.google/FD2f9RlRnXIVUh2Zi>



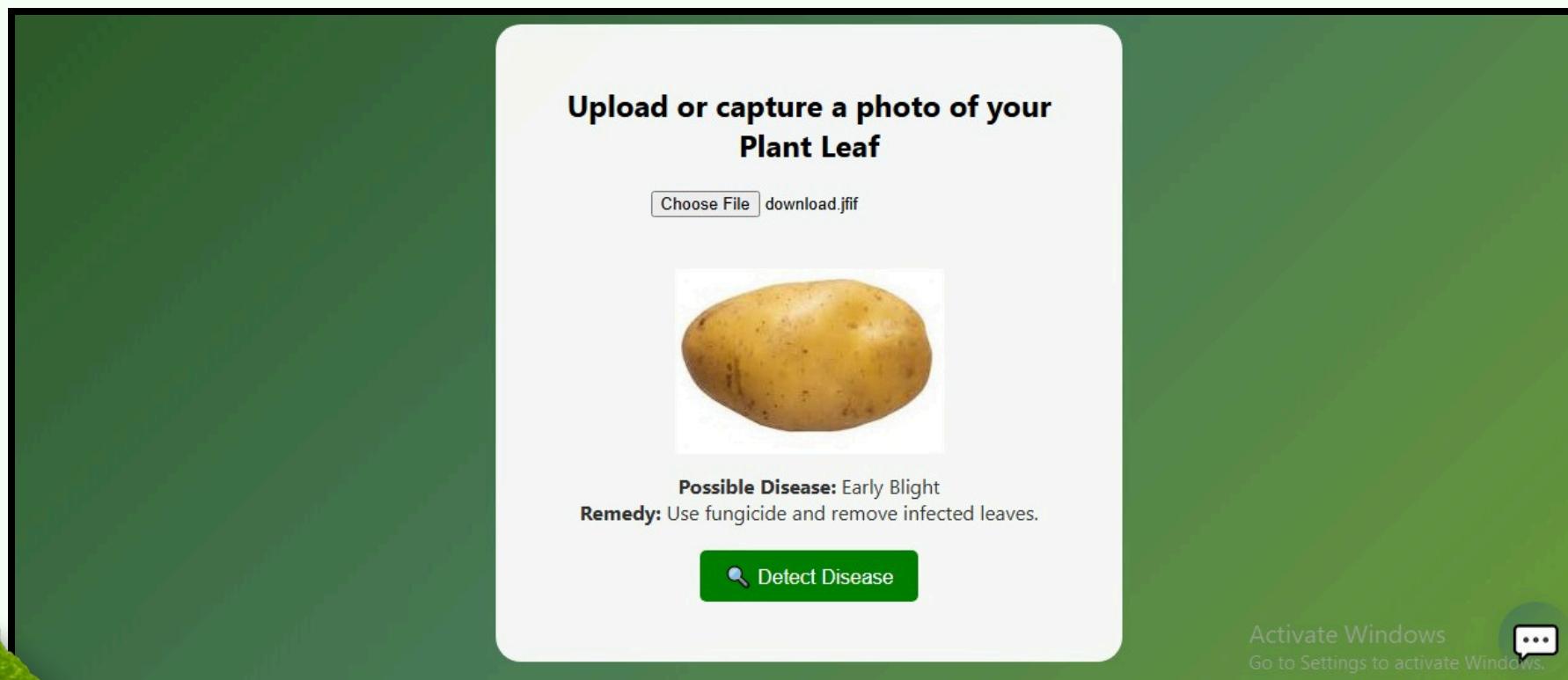
A screenshot of a website titled "PlantCare AI". The main heading is "Why It Matters" with the subtitle "Understanding the global impact of plant disease detection". Below this are three cards: "Global Food Security" (with a globe icon), "Environmental Protection" (with a leaf icon), and "Economic Impact" (with a coins icon). Each card contains a brief description of its respective topic.

A screenshot of a browser window showing the "GreenGuard" website. The page features a large green circular logo with a stylized plant icon. The title "GreenGuard" is prominently displayed, followed by the tagline "Detect plant diseases instantly with AI-powered vision". A green "GET STARTED" button is visible. Below the button are three icons: a magnifying glass for "Instant Detection", a robot head for "AI Powered", and a smartphone for "Mobile Ready". The browser's DevTools interface is visible at the top, showing tabs for "What's new in DevTools, Chrome" and "Sent Emojis".

SCREENSHOTS



SCREENSHOTS



The Problem

Farmers worldwide struggle with crop diseases that devastate harvests

Devastating Crop Losses

Every year, plant diseases destroy 20-40% of global crop production, causing billions in losses and threatening food security. Traditional disease detection methods are often too slow, requiring expert knowledge that many farmers lack. By the time visible symptoms appear, it's often too late to save the crop. Farmers need early detection tools that are accessible, accurate, and affordable to protect their livelihoods and feed the world.

Late detection leads to excessive pesticide use, environmental damage, and reduced crop quality - problems that affect everyone from farmers to consumers.



CONNECT WITH US



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Thank You