Crop Disease Detection and Pesticide Recommendation System for Farmers

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Introduction

- Farmers often struggle to identify crop diseases early due to limited access to experts, leading to lower yields and financial loss.
- With the rise of smartphones, AI can be used to detect crop diseases from leaf images and recommend suitable treatments, making farming more efficient and productive.

Motivation

- 🌾 Agriculture is vital for the economy and food security.
- 👨‍🌾 Rural farmers lack expert access.
- 📉 Crop losses due to disease can reach 20–40%.
- Android/Mobile Phone support

Objectives

- Detects crop diseases from leaf images using AI.
- Provide pesticide/treatment recommendations.
- Develop a simple, multilingual interface for farmers.
- Optimize system for low-resource rural environments.
- Interaction in preferred language.

Current Features

- 📸 Image Upload (leaf photos).
- 🤖 Disease Detection (classification).
- 💊 Pesticide Suggestion.
- 🗂️ Small Disease Database.

Technology Stack

- **Frontend:** React (Web) / Android (optional)

- **Backend:** FastAPI (Python)
- **AI Model:** TensorFlow / PyTorch (CNN, MobileNet/EfficientNet)
- **Database:** PostgreSQL
- **Deployment:** Render/Heroku (backend), Vercel (frontend)
- **Dataset:** PlantVillage + local crop images

Features to Add Later

- 🔬 Multi-label disease detection.
- 📡 Offline model support.
- 🌦️ Context-aware recommendations (weather/soil).
- 📊 Explainable AI (visual explanations).
- 👫 Community farmer forum.
- 📱 Dedicated mobile app.
- 🛒 **Nearest Shop Suggestion:** Show nearby shops where the recommended pesticide is available (using location + local vendor database).
- 🗣️ **Interactive Farmer's Preferred Language (Bangla) Support:** Farmers can interact using Bangla (text/voice) and receive responses in Bangla (text/voice) for maximum accessibility.

Conclusion

- This project will provide farmers with an easy-to-use tool for detecting crop diseases and finding treatments.
- The initial version will focus on image-based detection and pesticide recommendation.
- Future extensions will make the system more advanced by adding **shop locator** and **interactive Bangla support**, making it both practical and research-oriented.

Team members

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