AGROHEALTH

ChatBot for Farmers with Plant Disease Detection

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The Challenge in Agriculture

- Farmers often struggle to correctly identify plant diseases at early stages.
- Manual inspections by experts are costly, time-consuming, and not always accessible.
- Delayed diagnosis leads to severe crop damage, lower yields, and economic losses.
- Need: A quick, reliable, accessible, and affordable system for early disease detection and guidance.

Our Smart AI Solution

- We have developed a user-friendly web application where farmers or gardeners can upload an image of a plant leaf.
- An AI model instantly analyzes the image and detects the disease if present.
- The platform offers suggested questions and a chatbot for detailed guidance on symptoms, treatment, and prevention.
- It aims to save crops, improve productivity, and make plant healthcare accessible to everyone.

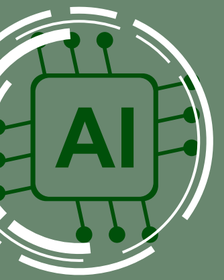
TECH STACK

- FRONTEND:
  - STREAMLIT
- MODEL:
  - TENSORFLOW KERAS CNN
- BACKEND LOGIC:
  - PYTHON LIBRARIES
    - OPENCV
    - PIL
    - NUMPY
- CHATBOT INTEGRATION:
  - GROQ API (USING LLAMA-3 MODEL)
- HOSTING/LOCAL DEPLOYMENT:
  - STREAMLIT SERVER

INTELLIGENT CHATBOT ASSISTANCE

- Integrated a large language model (LLama-3) through GROQ API.
- Provides natural conversation for users to ask any plant-care related questions.
- Suggests specific questions automatically after disease prediction (e.g., treatment methods, symptoms, fertilizers).
- Ensures the user gets expert-level guidance in simple language without needing professional help.
- Dynamic – not hard-coded responses; it understands and answers new queries too.

AI MODEL FOR DISEASE PREDICTION



- Built using a Convolutional Neural Network (CNN) architecture.
- Trained on PlantVillage dataset containing over 38 classes (healthy + diseased leaves).
- Preprocessing includes image resizing (224x224), normalization, and augmentation.
- Achieved >90% validation accuracy ensuring highly reliable predictions.
- Can detect multiple plant diseases like Common Rust, Apple Scab, Tomato Blight, and more within seconds.

WORKING OF AGROHEALTH

- Users interact through a Streamlit-based web application.
- The home screen displays a chat interface and options to type messages or upload plant images.
- When a user uploads an image, the system analyzes it and predicts the plant disease.
- After disease detection, suggested questions are displayed to guide users toward further queries.
- Users can chat with an intelligent plant-care chatbot powered by a Groq AI model to receive detailed advice and treatment methods.
- The conversation is dynamic and interactive, ensuring a smooth and friendly user experience.

Impact and Future Enchancements

- AgroHealth offers an accessible, affordable, and accurate way to diagnose plant diseases instantly.
- Reduces dependency on manual inspections and improves crop management.
- Future Enhancements:
  - Building a mobile app version for farmers in remote areas.
  - Adding voice support and regional languages for better accessibility.
  - Expanding detection to include pest attacks, nutrient deficiencies, and soil-related problems.
  - Real-time weather-based disease prediction integration.

THANK YOU