Mobile Disease Detection App - Project Documentation

Project Overview

The Mobile Disease Detection App is an innovative AI solution designed to assist humanitarian efforts in agriculture by enabling early detection of crop diseases. This tool aims to empower farmers and agricultural workers, particularly in regions where resources and expertise may be limited.

What this AI solution does for humanitarian work: The app uses advanced computer vision techniques to analyze images of crops and identify potential diseases. By providing timely information, it helps farmers take preventive measures, ultimately improving food security and livelihoods.

Who it's designed to help: The primary users are farmers, agricultural extension workers, and NGOs involved in agricultural development. It is particularly beneficial in rural areas where access to agricultural expertise is scarce.

Key capabilities and limitations:

Capabilities:

- Detects various crop diseases from images.
- Provides immediate feedback to users.
- Supports multiple crop types.

Limitations:

- Requires a smartphone or device with a camera.
- Accuracy may vary based on image quality and lighting conditions.
- Limited to the diseases included in the training dataset.

How It Works

The app leverages computer vision, a field of artificial intelligence that enables computers to interpret and understand visual information.

Simple explanation of the AI approach: The app analyzes images of crops using a trained model that recognizes patterns associated with specific diseases. When a user uploads an

model that recognizes patterns associated with specific diseases. When a user uploads an image, the model processes it and identifies any potential diseases.

What data it needs: Users need to provide clear images of the crops they wish to analyze. The app does not require any personal data from users.

What results it provides: The app returns a diagnosis of the crop's health, indicating whether a disease is present and suggesting possible actions to take.

Getting Started

To test the Mobile Disease Detection App, follow these steps:

Prerequisites for testing:

A smartphone or tablet with a camera.

Basic understanding of how to install and use mobile applications.

Initial setup requirements:

Download the app from the designated source (link to be provided).

Ensure your device has internet access for optimal performance.

First steps for humanitarian users:

Open the app and follow the on-screen instructions to take a picture of the crop.

Submit the image for analysis and wait for the results.

Testing the Prototype

To effectively test the prototype, use the following guidelines:

How to test with sample data:

Use the app to capture images of healthy and diseased crops.

Compare the app's diagnosis with known outcomes.

What results to expect:

The app should provide a clear indication of whether a disease is detected, along with a confidence score.

How to interpret outputs:

A high confidence score indicates a strong likelihood of disease presence, while a low score suggests that the crop is healthy or that the disease is not recognized.

Ethical Considerations

The Mobile Disease Detection App is designed with ethical considerations in mind:

Built-in protections for beneficiaries: The app does not collect personal data, ensuring user anonymity and protection.

Privacy and data handling: All images are processed locally on the device, and no data is stored or shared without user consent.

Bias prevention measures: The model is trained on diverse datasets to minimize bias and improve accuracy across different crops and conditions.

Technical Overview

This section provides insight into the technical components of the project:

Files included in the project:

`app.py` : Main application file.

`model.py` : Contains the AI model for disease detection.

`preprocessing.py` : Handles image preprocessing tasks.

`inference.py` : Manages the inference process for predictions.

`assets/disease_metadata.json` : Contains metadata about diseases.

`requirements.txt` : Lists necessary libraries and dependencies.

`README.md` : Provides an overview and instructions for the project.

System requirements:

Compatible with Android and iOS devices.

Requires a camera and internet connection for optimal functionality.

Integration possibilities: The app can be integrated with existing agricultural management systems or platforms for enhanced functionality.

Next Steps

To transition from prototype to production, consider the following:

Moving from prototype to production: Conduct further testing and gather user feedback to refine the app.

Technical team requirements: A team of developers and data scientists will be needed to maintain and update the app.

Scaling considerations: Plan for scalability to accommodate more users and additional crop diseases in future versions.

Support and Resources

For assistance and further information, refer to the following resources:

Troubleshooting common issues: Check the FAQ section in the app for common problems and solutions.

Where to get help: Contact the support team via the app or email for technical assistance.

Additional documentation references: Access further documentation and resources through the project repository or website.