Final

User Manual for the Field-Based Computer Vision System for Anthracnose Detection and Severity Estimation in Mango (Mangifera indica L.) Leaves Prototype Interface

I. Introduction

This user manual serves as a guide for operating the Field-Based Computer Vision System for Anthracnose Detection and Severity Estimation in Mango (Mangifera indica L.) Leaves prototype interface developed using the Kivy framework. The prototype offers users an intuitive way to interact with the system, primarily for scanning, storing, and managing mango leaf images for disease detection purposes. The interface is designed for a **480x800 touchscreen display**, optimized for ease of use and clarity in field operations.

II. System Overview

The interface contains **five main screens**, each serving a specific function in the prototype workflow:

1. Home Screen
2. Scan Screen
3. Capture Result Screen
4. Records Screen (and Gallery Screen)
5. Help Screen

Each screen provides buttons and controls for navigating between system functions.

III. System Requirements

- **Display Resolution:** 480 × 800 pixels
- **Platform:** Kivy Framework (Python-based GUI)

- **Hardware Components:**
    - Camera module for leaf scanning
    - Raspberry Pi 4b
    - Touch display
    - Storage module for saving images and data records
- **Optional Connectivity:** Wi-Fi or Bluetooth (for sharing via QR code)

IV. Interface Guide

1. Home Screen

The Home Screen is the starting point of the prototype. It provides access to the main system functions through four buttons:

- **Scan Button:** Opens the Scan Screen, where you can use the camera module to capture an image of a mango leaf.
- **Records Button:** Opens the Records Screen to view and manage saved records.
- **Share Button:** Opens the Share Screen, displaying a QR code for sharing data and captured images.
- **Help Button:** Opens the Help Screen containing detailed information and guidance on using the prototype.

2. Scan Screen

After clicking the **Scan Button** on the Home Screen, you will be directed to the Scan Screen.
This screen displays the live camera feed and three main buttons:

- **Cancel Button:** Returns you to the Home Screen.

- **Scan Button:** Initiates the leaf scanning and image capture process.

- **Guide Button:** Displays a pop-up guide with scanning instructions and tips for optimal image capture.

3. Capture Result Screen

Once the image is captured, the interface transitions to the Capture Result Screen.
Here, you can view the captured image and perform the following actions:

- **Result Button:** Proceeds to the Result Screen, where detailed analysis and leaf classification data are displayed.

- **Retake Button:** Returns to the Scan Screen to capture a new image.

- **Save Button:** Opens the Save Screen, allowing you to store the image and its corresponding data.
  After saving, the system prompts you to either:

    - Scan another leaf, or

    - Return to the Home Screen.

4. Records Screen

Accessible via the **Records Button** on the Home Screen.
This screen displays all saved entries, including scanned images and their corresponding results.

You can:

- **View Records:** Open an entry to display all captured images within that record.

- **Edit or Delete Records:** Modify or remove specific entries as needed.

Selecting **View Records** navigates to the **Gallery Screen**, where all images within the chosen record are displayed.
In the **Gallery Screen**, you can:

- **Click on an Image:** View the image and its detailed result.

- **Filter Photos:** Use filter options to organize or locate specific images easily.

5. Share Screen

The Share Screen allows you to transfer scanned data and images to another device via a QR code. By scanning the QR code using a mobile device, you can instantly share records from the prototype system for further analysis or archiving.

6. Help Screen

The Help Screen provides additional information for user reference, including:

- **Anthracnose Disease Description** – details about mango anthracnose, symptoms, and the importance of early detection.
- **System Specifications** – hardware and software details of the prototype.
- **Guidelines and Precautions** – safe and proper use of the system.
- **About Us** – information about the developers and project background.

V. Safety and Usage Guidelines

- Ensure proper lighting when scanning leaves to improve detection accuracy.
- Keep the camera lens clean for clear image capture.
- Avoid shaking the device during scanning to prevent blurred results.
- Do not expose the prototype to water or extreme temperatures.
- Regularly back up records to prevent data loss.

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III. System Requirements

- **Display Resolution:** 480 × 800 pixels
- **Platform:** Kivy Framework (Python-based GUI)
- **Hardware Components:**
    - Camera module for leaf scanning
    - Microcontroller or embedded system board (e.g., Raspberry Pi)
    - Touch display

    - Storage module for saving image and data records

- **Optional Connectivity:** Wi-Fi or Bluetooth (for sharing via QR code)

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