Hand Detection & Finger Count Project

Project Overview

This project implements a real-time hand detection and finger counting system using computer vision techniques. It detects a hand in the camera frame, identifies the number of extended fingers, and displays the count dynamically. The system can be used for gesture recognition, human-computer interaction, and educational purposes.

Features

- Real-time hand detection using a webcam.
- Finger counting with visual feedback (bounding box around hand, count displayed).
- Robust detection for multiple hand positions.
- Optionally, display frame information for performance monitoring.

Requirements

- Python 3.x
- Libraries:
  - opencv-python
  - mediapipe
  - numpy

Install required libraries via pip:

```
pip install opencv-python mediapipe numpy
```

Installation & Usage

1. Clone the repository:

```
git clone https://github.com/yourusername/hand-finger-count.git
cd hand-finger-count
```

2. Run the main script:

```
python hand_finger_count.py
```

3. Point your webcam at your hand and extend fingers to see the count appear on the screen.

Code Overview

- hand_finger_count.py ? Main script that captures video from the webcam, detects hands, counts fingers, and displays the result.

How it Works

1. Hand Detection ? Detect the hand and landmarks using MediaPipe.
2. Finger Counting ? Analyze landmark positions to determine which fingers are extended.
3. Display Output ? Draw a bounding box around the detected hand and display the finger count.

Potential Improvements
- Multi-hand detection and counting.
- Integration with mobile or web apps.
- Gesture-based commands for controlling devices.

Author
[Your Name]
Date: [Insert Date]
Contact: [Your Email / GitHub]