**Virtual Mouse Documentation**

**Overview**

The "Virtual Mouse" project uses a webcam to track hand movements and control the mouse cursor on the screen. It leverages the MediaPipe library for hand tracking, OpenCV for video processing, and PyAutoGUI for simulating mouse movements and clicks. This application allows users to move the mouse cursor and perform click actions by moving their hand in front of the camera.

**Dependencies**

Ensure you have the following libraries installed:

* OpenCV
* MediaPipe
* PyAutoGUI

You can install them using pip:

pip install opencv-python mediapipe pyautogui

**How It Works**

1. **Capture Video:**
   * The code starts by capturing video from the webcam using OpenCV.
2. **Hand Detection:**
   * It uses MediaPipe to detect hands in the video frame.
   * If hands are detected, it draws landmarks on the hands.
3. **Tracking Landmarks:**
   * For each detected hand, it calculates the position of the index finger tip (ID 8) and the thumb tip (ID 4).
4. **Mouse Control:**
   * If the distance between the index finger tip and the thumb tip is less than 20 pixels, it simulates a mouse click using PyAutoGUI.
   * If the distance is less than 100 pixels, it moves the mouse cursor to the position of the index finger.
5. **Display Video:**
   * The frame is displayed with the hand landmarks and circles indicating the index finger and thumb tips.

**Usage**

* Ensure your webcam is connected and working.
* Run the script.
* Move your hand in front of the webcam. The index finger controls the cursor position, and bringing the thumb close to the index finger will simulate a mouse click.

**Notes**

* The script uses the webcam as the input device. Ensure proper lighting and background conditions for accurate hand detection.
* The distances for clicking and moving the cursor can be adjusted by changing the threshold values in the code.

This should provide a comprehensive guide to understanding and using the "Virtual Mouse" code.