Gesture Controlled Virtual Mouse Documentation

Introduction: This code is a Python implementation of a gesture-controlled virtual mouse that tracks the user's hand movements using the MediaPipe library to control the cursor's position and perform mouse clicks. The mouse cursor can be moved by pointing the index finger, and the left-click function can be triggered by bringing the thumb finger close to the index finger, while the Thanos Snap function can be triggered by bringing the thumb and middle finger close to each other.

Requirements: This code requires the following libraries to be installed:

1. cv2
2. mediapipe
3. pyautogui

Usage:

1. Run the code and grant access to the camera.
2. Move the index finger to control the cursor position.
3. Bring the thumb finger close to the index finger to trigger a left-click.
4. Bring the thumb and middle finger close to each other to trigger the Thanos Snap function.

Code Explanation: The code starts by importing the necessary libraries, initializing the maximum number of hands to be detected, and setting up the video capture. The main function then starts with an infinite loop that captures the frames from the camera and processes them using the MediaPipe Hands library. The frame is then flipped and normalized before converting it to RGB format for further processing.

The position of the hand landmarks is then detected using the MediaPipe Hands library. The FPS is calculated and displayed on the screen. If a hand is detected, the position of the index finger, middle finger, and thumb finger are obtained. The cursor position is set to the middle finger's location, and the mouse is moved using the pyautogui library.

The code then checks if the thumb and index finger are close to each other. If they are, the left-click function is triggered using the pyautogui library. If the thumb and middle finger are close to each other, the Thanos Snap function is triggered, and the code breaks out of the infinite loop.

Finally, the processed frame is displayed on the screen, and the code waits for the user to press any key before capturing the next frame.

Conclusion: The gesture-controlled virtual mouse code is a simple yet innovative way to control the cursor's position and perform mouse clicks using hand gestures. The code can be easily modified to perform other functions or to detect multiple hands simultaneously.