Title: Virtual Mouse using Hand Gestures

Abstract:

The idea of virtual mouse using hand gesture is to have a special mode with authentication called mouse mode to be available in laptops so that the user can enable and disable it anytime. At times we/users forget to carry a mouse and we have this mode switching option it will be more convenient. This can be achieved using Computer Vision technology so that it can detect and recognize the gestures so that the user can use the computer hand free. By using algorithms we can track the hand and recognise gestures in such a way that the if the user makes specific gesture it should correspond to specific mouse action like pointing (moving the on-screen cursor), clicking (pressing and releasing a button, usually the left one), double-clicking, right-clicking (to open context menus), scrolling (using the wheel), and dragging (holding a button down to move items, known as drag-and-drop).

The project's main goal is to develop an accessible mouse instead of having a physical mouse carrying all the time. By using technologies like Python, OpenCV, Tensor Flow & MediaPipe to detect and recognize hand movements in real time using a camera. The recognition of gesture is based on movement of the hand by using pre-defined motion patterns, so that the system can respond instantly to the user action. There are various applications of virtual mouse Human-Computer Interaction by Controlling devices or applications with hand gestures, Sign Language Recognition to interpret sign language in real-time, Gaming to use hand gestures for interactive gameplay, Accessibility to provide alternative input methods for individuals with disabilities.