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Virtual mouse implementation with hand gesture recognition using OpenCV and VNC

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By enabling users to remotely operate another computer or virtual machine over a network connection and applying to real-world elements, Virtual Network Computing (VNC) plays a vital role in enhanced remote access. Virtual remote control is the ability to use software with a graphical user interface to remotely manage a computer or virtual machine. The system's core functionality is built on computer vision techniques, employing OpenCV to process live video streams from a webcam and detect the user's hand gestures in real-time. Various preprocessing steps, such as background subtraction, thresholding, and contour detection, are applied to isolate and track the hand region accurately. A custom hand gesture recognition algorithm is designed to interpret the detected hand movements and recognize different gestures, such as open hand, closed fist, pointing, and scrolling, among others. These recognized gestures are then mapped to corresponding mouse actions, including cursor movement, left-click, right-click, and scroll. This paper presents a novel approach to implement a virtual mouse system through hand gesture recognition using OpenCV and VNC (Virtual Network Computing). The proposed system aims to provide an intuitive and hands-free interaction with a computer, eliminating the need for a physical mouse or touchpad. The proposed virtual mouse system offers numerous advantages, such as increased accessibility for users with physical disabilities and a more natural and intuitive interaction paradigm. The system's effectiveness and performance are evaluated through extensive experiments,

demonstrating its robustness and accuracy in various usage scenarios.

Topics

Image processing, **Artificial intelligence**, **Graphical user interface**, **Telemetry**

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