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Hand Gesture Based Virtual Mouse

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Abstract: ***Since the invention of the PC, a method for creating a connection cycle between humans and computers is currently being developed. A truly innovative piece of HCI(Human Computer Interaction), the mouse. There are still such gadgets around even though remote control or Bluetooth mouse technology is still in development. A Bluetooth mouse requires a dongle for connectivity and battery. The difficulty of using a mouse increases when it has additional devices. The suggested mouse framework goes beyond the point. This study suggest an HCI-based virtual mouse framework that makes use of computer vision and hand signals. Signals generated with a location method and shading division and captured using a built-in camera and webcam. The customer will be able to exercise partial control over.***
Keywords: open CV, Numpy, PyAutoGUI, Image Processing, Virtual Mouse

I. INTRODUCTION

The size of the devices is decreasing as result of the improvements. Some devices have become remote, while others have been inactive. The paradigm suggested in the paper could eventually lead to the dormancy of some HCI(Human - computer Interaction) devices.

The goal is to create a virtual mouse that utilises best recognition we will stop the idea is to use a simple camera as opposite to a traditional or standard mouse device to control mouse cursor capabilities. All that is required for a virtual mouse to function as a conduit between the user and the system is a camera. It permits mouse control and facilitates human interaction with a physical machine divide of a mechanical or physical mechanisms. It is definitely conceivable in this gesture detection system.

This framework utilises the openCV package, which is based on computer vision, and is created in the python programming language. This system may replace both the conventional moves and the remote machine controller. The lighting situation is the only hindrance. Because the majority of computers are used in low-light environments, For this reason, the framework can't be enough to replace the conventional mouse.

II. LITERATURE SURVEY

There are numerous ways to use hand signals to control cursor software, but most of the time, a data Glove is necessary. This results in less effective execution between the client and the framework. In present cycle, framework complexity is likewise a problem. Additionally, there are two forms of vision based hand gesture recognition: marker based and non marker based. In general, non marker based recognition has poorer accuracy than recognition that is. Even if the user must place a straight forward colour cap on the fingertip, marker based recognition is more accurate than other guest recognition systems. However, compared to the data Glove of the hardware based system, this method is far lighter and barely noticeable. Gesture recognition could be a cutting edge method for computers.

III. EXISTING SYSTEM

All of us are aware of the current state of PC control using the hands, which requires genuine labour. As a result, this may occasionally be difficult for people. We employee hand developments by coming into contact with the optical device to operate a simple force point show on the computer. For instance, using the mouse to go to the following slide or the scroll wheel to increase the out. We discuss the difficulties people have at home in addition to the PC connection. The current system is time- consuming, stressful, and also have a negative impact on one's health.

IV. PROPOSED SYSTEM

For mouse click events and mouse control for PC-based exercises like zoom in, zoom out, and preview, a PC, some colour caps, and a sensor (webcam) are necessary. The user makes a hand motion that the sensor recognises for the particular application. The sensor transmits this message to the computer, which then executes the signal's suggested action. Here, we will employ hand gestures to construct the virtual mouse.

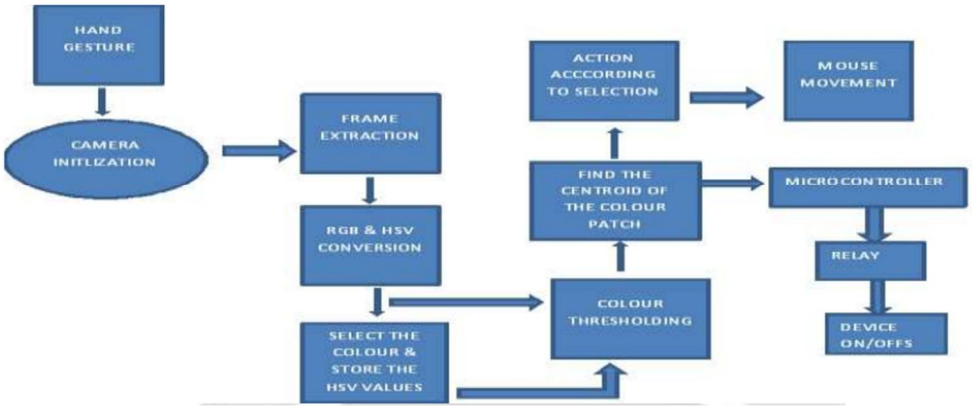
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V. WORKING METHODOLOGY

Any framework sensors are a basic requirement. So a sensor (webcam) is also used in this framework to connect with the environment. Its function is to capture life footage that the user contributes by way of a hand signal Before passing this information to openCV, it is analysed. In this case, CV creates a code that is utilized to turn the live video into picture frames. The term "cutting of video" truly refers to this action. Then, only the images with colors specified in the code are maintained after this frames have been processed for color recognition. The framework get rid of any left over pictures. The speed that output images are displayed corresponds to the speed.

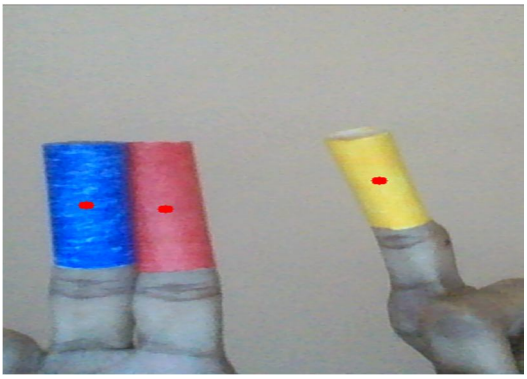
VI. BLOCK DIAGRAM



VII. RESULTS



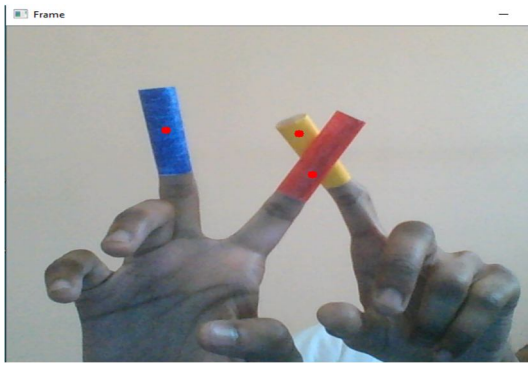
1.FOR MOUSE MOVEMENT, YELLOW



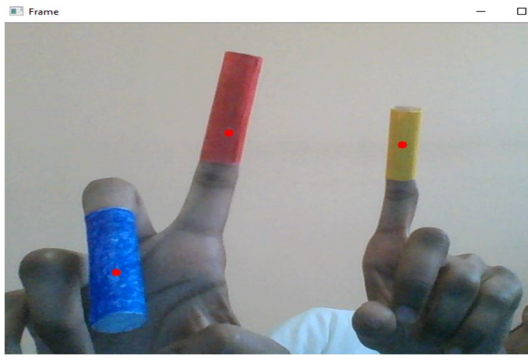
2. LEFT CLICK (TOUCHES RED AND BLUE)

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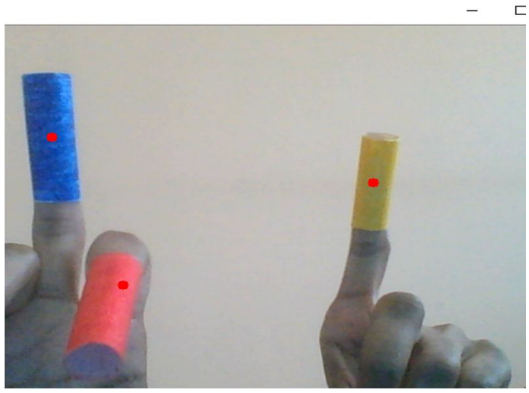
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3. RIGHT CLICK (YELLOW, RED TOUCHED)



4. SCROLL UP (BLUE IS DOWN AND RED IS UP)



5. SCROLL DOWN (RED IS DOWN AND BLUE IS UP)

VIII. CONCLUSION

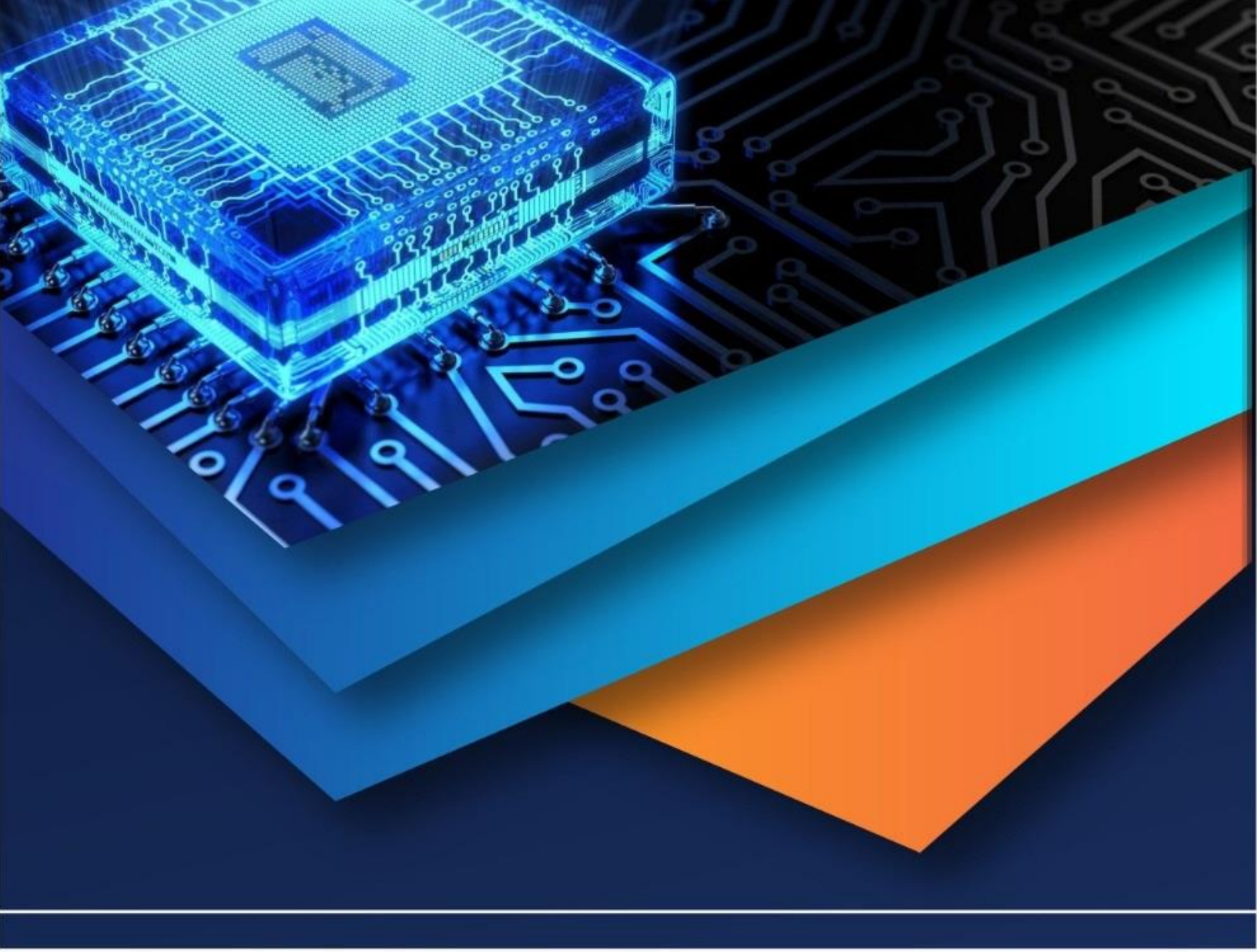
A real-time camera is used to guide the mouse cursor and carry out its tasks with the help of this virtual gesture control mouse. We practise Mouse movements, Symbol selection, and most actions like left, right, double clicking, and scrolling. To track mouse movements and identify symbols, this system relies on picture comparison and motion detection. Examining the outcomes, it is generally believed that, on the off chance that we provide adequate lighting and a decent camera, it can operate in any location. That's that when we are going to organise our structure better. In the future, more functions will be integrated using the palm and other fingers, including association in multiple windows windows, expansion and contraction, window closure, and so on. This project may help reduce the amount of workspace and the weight on extra equipment. Since this project is more agile than any other contemporary framework looking for PC association, it will actually want to withstand itself in the majority of circumstances. It makes the user and the workspace closer than before because it removes the weight of gadgets.

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