JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

SURVEY ON VIRTUAL MOUSE USING HAND GESTURE

[1]Prof. A.N.Mandale
Computer Science and Engineering
Dr. Daulatrao Aher College of Engineering, Karad
Maharashtra, India
anmandale.cse@dacoe.ac.in

[2]Ms. Namrata Shinde
Computer Science and Engineering
Dr. Daulatrao Aher College of Engineering, Karad
Maharashtra, India
namratashinde055@gmail.com

[3]Ms. Harshada Tapase
Computer Science and Engineering
Dr. Daulatrao Aher College of Engineering, Karad
Maharashtra, India
harshadatapase2018@gmail.com

[4]Ms. Pranali Gharge
Computer Science and Engineering
Dr. Daulatrao Aher College of Engineering, Karad
Maharashtra, India
pranaligharge162001@gmail.com

[5]Ms. Shreya Kadam
Computer Science and Engineering
Dr. Daulatrao Aher College of Engineering, Karad
Maharashtra, India
kadamshreya153@gmail.com

[6]Ms.Radhika Mane
Computer Science and Engineering
Dr. Daulatrao Aher College of Engineering Karad,
Maharashtra, India
rm6444216@gmail.com

Abstract : ***This project demonstrates a concept that has been explored in Human Computer Interaction studies: employing hand gestures to control a video display. This experiment shows how our fingertips may be used to move the cursor on a screen. The three primary algorithms mediapipe, OpenCV, and autopy are all that are required for this to happen, along with a working webcam. Autopy is used to control mouse movement and functionality, followed by OpenCV for drawing and image processing, and Media pipe for hand tracking.***

Index Terms -: OpenCV, Mediapipe, Autopy, Hand Gesture, HCI.

I. INTRODUCTION

Human-Computer Interaction (HCI) is a notable subfield of computing in the modern era. HCI may be an interdisciplinary field of study that focuses on engineering design and, more particularly, how people (users) interact with computers. One of the biggest difficulties in human-computer interactions is the development of more cooperative and realistic interfaces. We are compelled to use the pre-installed apps on our gadgets. Currently, computing environments must have access to high-resolution pointing systems with a single, solated, two-dimensional cursor. The modern algorithms provide the best solution of human interaction with computer day by day. Although computers have made tremendous advancements, the common human-computer interface (HCI) still uses keyboards and mice as input devices. Later as technology developed rapidly, wireless mice were produced to allow for the mouse's hassle-free movement and to improve precision. In contrast, no matter how much the accuracy of the mouse improves, there will always be hardware limitations and potential problems because the mouse is a hardware device like all other entities. The mouse will eventually reach the end of its functional lifespan, at which point we must change the mouse. When using our fingers to control a virtual mouse via hand gestures, there will be a positive development in technology. This innovation will improve computers [1]. The interaction reaches a new limit. Soon, this motion movement will be designed

utilizing open-source software to make it simple for each user. Sources include Python, Autopy, and OpenCV, etc. The virtual mouse will be able to recognize the fingers by using its own system's camera. The main goals of this project paper are to reduce costs and to have accuracy at a high level. In addition, we're attempting to assist those who are physically challenged and unable to use a physical mouse by providing them with a simple way to complete their tasks quickly and efficiently. [2]

II. EXISTING SYSTEM

The current system proposed an incredibly high demand on available resources. Due to this, there haven't been many users who could afford it. Many software or applications claim to be able to control the mouse without touching it, but when used in reality, they either use inappropriate colour monitoring techniques or coloured tape on the finger to control the mouse virtually. These methods are inappropriate for anyone to use to control that kind of equipment. Ultimately, no one can achieve a precise result or fail to smooth out the virtual mouse's movement, which makes it difficult to use and disturbs its motion. Additionally, the project's environment wasn't welcoming, which made certain users less equipped to handle it. The current system isn't very called its numerous flaws to examine that one.

III. PROBLEM IDENTIFICATION

Even now, despite the development of input devices over the years, many of us still find using computers and other technology to be an unpleasant experience. Computers and hardware should be tailored to our natural modes of communication: visual communication and speech. In our intended project, we have created a system that is free and simple to use, and that can control our display screen with the help of our hand movements. Virtually our intended A mouse can be used to overcome challenges in the real world, such as instances where there isn't enough room to use a physical mouse and for people who have hand issues and are unable to use a physical mouse. And speaking of the COVID-19 issue in the globe today, it is not safe to use the gadget by touching them because doing so could lead to a situation in which the fungus spreads or touches people.

IV. FLOW MODEL

The flow model depicts how the system operates with various functions. The system will initially receive an image from the system camera and convert web camera video collected footage into frames. The input image will then be resized so that segmentation can take place and the spots on the image can be detected. It will remove noise from the image and start by displaying the image's center radius for the given finger tips. The radius points will be positioned in the middle of the fingertip's image. Now that the fingers are moving, the fingertip movement will follow suit. The point of the radius will be detected; we will now move our fingers to manage the cursor. [3]

V. PROPOSED METHOD

In the suggested method, we obtain the crucial time-sensitive photos and videos from webcams so that they can be processed and converted into photographs. The next step is to extract those tips from the photographs since the transformed images will contain distinct finger tips. Once the extraction process is complete, the points will be located using the supplied id of the relevant fingertip. This procedure is known as the detection mode and point detection. After detecting the points, it will monitor how the pointer is travelling across the screen. Then we can accomplish the action of the muzzle.

SYSTEM ARCHITECTURE

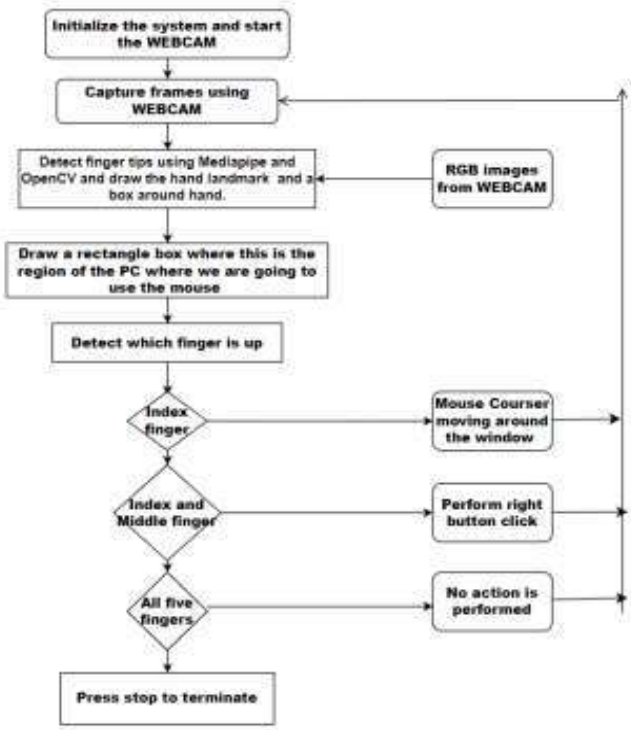

FIGURE 1: SYSTEM ARCHITECTURE

VI. LITERATURE SURVEY

[1] "Hand Tracking and Hand gesture Recognition for Human Computer Interaction" [Dejon Chandra Gope, Vol.4 No.6. Nov. 2012]

The problem of hand tracking and hand gesture recognition for human-computer interaction is significant in the field of HCI. The implementation and analysis of a technique for estimating static hand poses based on vision are presented in this study. Using image processing in a 3D pointing interface is presented to estimate the pose of a with a finger motion. The vision community has investigated many methods for background-subtraction or skin-color segmentation to isolate human skin patches. However, this approach has a number of limitations in real-world applications because it uses a preset threshold for picture binarization and pre-set values for finger length and thickness. Despite achieving great speed and precision when measuring hand postures, this method is unsuitable for several applications because to the restricted range of motion that the linked wires produce. As a result, we were unable to clearly discern the hand's shape from the video streaming. The scrolling result, however, indicated that the time was unsteady

[2] "A Real Time Hand Gesture Recognition System Using Motion History Image" [Chen-Chaung Hsieh and Dung Hua Lieu, icsps, 2010]

This system lacks a hand gesture system and instead relies on the generic mouse and trackpad method of monitor control. It is not possible to remotely view a monitor's screen using hand gestures. Although it is primarily attempting to implement, the scope is merely limited to the field of virtual mice. The hand recognition system is solely used for simple mouse actions in this project. This has few clearly defined activities and a lot of confusion.

[3] "Virtual Mouse Using Hand Gesture" [Swapnil Mathane, Prof. Shital Pawar, Kunal Chandak, Varad Deshpande, Firdaus Naseem,2022]

In this research, a unique camera vision-based cursor control system is proposed, which makes use of hand motions recorded from a webcam utilizing a color detection method. The technology will allow users to move the entire cursor by using their hands to make distinct hand motions for the left click and dragging. In this study, an efficient hand gesture segmentation method based on pre-processing, background subtraction, and detection techniques is proposed. This project will focus on straightforward actions like clicking. And other hand gesture actions like transferring files between computers using complex socket programming and carrying out straightforward tasks that can be handled by hand recognition. System operates mouse functionalities by detecting red and performing mouse actions. This project's one limitation is that it cannot be completed in environments with many complicated backgrounds or lighting conditions. More precise hand detections must be made, though.

[4] "Mouse Cursor Control System Based on Hand Gesture" [Horatiu-Stefan, Grif Cornel, Cristian Farcas,2015]

A prominent problem in computer science is gesture recognition, which entails creating systems that translate user gestures so that anyone can interact with a device without actually touching it. The process of identifying, representing, and translating a gesture into a specific intended instruction is known as gesture recognition. A map is the intended output of hand gesture recognition software, which aims to recognize from a specific hand movement that is provided and process this gesture representation on the devices. [4]

VII. CONCLUSION

In the end, we draw the conclusion that learning a lot of things throughout project development, including how to work with dynamic apps, databases, and the Python language. In a word, it can be said that the project circles' future focus is on giving students who are physically challenged and those who desire to do away with the physical mouse access to virtual mouse.

VIII. ACKNOWLEDGMENT

I would like to express my gratitude to Professor A. N. Mandale for his helpful advice in doing my research. This research would not have been possible without the intellectual impact and encouragement of the Computer Science and Engineering Department at the Aher College of Engineering

IX. REFERENCES

[1] Chen-Chiang Hsieh and Dung-Hua Lieu, "A Real Time Hand Gesture Recognition System Using Motion History Image" icsps,2010.

[2] Abhik Banerjee, Abhirup Ghosh, Koustuv moni, Bharadwaj, "Mouse Control using a web camera on color detection", IJCTT, vol.9, Mar2014.

[3] Bai yu, Sang-Yun Park, Yun-sik Kim, In-Gab Jeong, Soo-Yol Ok, Eung-Joo Lee, Vol.14.February 2011, "Hand Tracking and Hand Gesture Recognition for Human Computer Interaction".

[4] Ashwini Patil, Sneha Dudhane, Monika Gandhi,Nilesh Uke, "Cursor control system using hand gesture recognition," *IJARCCE*, vol.2,no.5,2013.Viewat:GoogleScholar.

[5] Bankar RT, Salankar SS. "Head gesture recognition system using gesture camera" Fifth International Conference on Communication Systems and Network Technologies, Gwalior, MP, India, 2015,p.535-538.