MOUSE CONTROL USING HAND GESTURE
"Confidence to Continue"

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ABSTRACT:

Hand gesture recognition based man-machine interface is being developed vigorously in recent years. Due to the effect of lighting and complex background, most visual hand gesture recognition systems work only under restricted environment. An adaptive skin color model based on face detection is utilized to detect skin color regions like hands. To classify the dynamic hand gestures, we developed a simple and fast motion history image based method. Moreover, our method shows better performance than a state-of-art method on another data set of hand gestures.

Keywords:- Computer vision, Hand gesture, mouse controller.

INTRODUCTION:

In today's day and age, a better user interface can majorly contribute to the success of a product. Industries are working on making the computer-user interaction as smooth as possible. Smartphone has lost their buttons to make way for touch screen and we think that the time for replacing mouse has also come. We think that there is no need to use a separate mouse or touchpad to control the cursor. In this project, we are using hand gestures to eliminate the need for a mouse. We are simply using real-time hand detection to detect the user's hand and with the help of certain hand gestures, we are controlling the cursor. Firstly, the webcam provides input that is processed. The complete process is divided into 4 steps which are frame-capturing, image-processing, region-extraction, feature-matching. We have implemented gestures for moving cursor, right-click, left-click, scrolling, and for changing volume. These types of gestures are already used in the automobile industry to control the central entertainment system. The advantage of this system is that you no longer need to use the uncomfortable trackpad and buy a mouse which decreases the setup cost. This project is also very helpful in places where the use of a mouse is not possible. There is no extra component needed to use this project, you just need a webcam which is available on most of the laptops. This project has various applications such as TVs, speakers, games, etc.

Features:

- One finger hand gesture to control the cursor.
  Movement of the index finger from it's previous position is detected, and cursor is moved.
- Two finger hand gesture to right click
- Three finger hand gesture to left click
- Pinching action between index finger and thumb to increase and decrease volume. The distance between thumb and index finger is calculated and volume is adjusted according to it.
- Five finger hand gesture to scroll down and four finger hand gesture ton scroll up.

LITERATURE REVIEW:

1. In "Virtual Mouse Control Using Hand Class Gesture" published in December 2020, Written by the authors Vijay Kumar Sharma, Vimal Kumar, Sachin Tawara and Vishal Jayaswal, This paper proposes a way to control the position of the cursor with the bare hands without using any electronic device. While the operations like clicking and dragging of objects will be performed with different hand gestures. The proposed system will only require a webcam as an input device. The software's that will be required to implement the proposed system are OpenCV and python. The output of the camera will be displayed on the

system's screen so that it can be further calibrated by the user. The python dependencies that will be used for implementing this system are NumPy, math, wx and mouse.

2. In "Virtual mouse using hand gesture and colour detection" published in October 2015 and written by Amardip Ghodichor, Binitha Chirakattu wrote, In today's technological era, many technologies are evolving day by day. One such promising concept is Human- Machine Interface. For example, in a wired mouse there is no provision to extend limit. In wireless mouse, one should have Bluetooth hardware installed in the computer and Bluetooth dongle attached. The proposed technology will have no such limitations and will instead depend on gesture recognition. In this project, three technologies are mainly used: object detection, image processing and color recognition using 'Sixth sense technology'. Sixth sense technology is a set of wearable devices that acts as a gestural interface between the physical and digital world. The aim is to move the mouse cursor on the screen without using hardware such as a mouse and only by moving the cursor through finger movements i.e. the process of gesture recognition. In this paper, we present a novel approach for Human Computer Interaction (HCI) where cursor movement is controlled using a real-time camera.

3. In "Virtual Mouse Using Hand Gesture Recognition" by Kishor Prabhahar which was published in July 2017,he wrote: As the computer technology is growing up, the importance of human computer interaction is rapidly increasing. Most devices use touch screen technology which cannot be affordable to all the applications. A virtual human computer interactive module such as virtual mouse, can be an alternative way for the traditional touch screen. The objective is to create an hand tracking application to interact with system, and develop a virtual human computer interaction module. This module can be used for creating an interface between computer and human using hand gestures. This module is expected to gain abundance of attention because of its applications for human machine interface and its most futuristic design.

4. In august 2015, Abdul Khaliq and A. Shahid Khan wrote in "A Review on Virtual Mouse Using Hand Gesture and Color Detection", Now a day"s intelligent machine which can be used along with the computer are being developed, which helps in friendly Human Computer Interaction (HCI). Mouse & keyboard are unnatural and cumbersome to use at times by disabled people. Virtual mouse or keyboard is the solution for the disabled people to handle the computer system. In the recent years different technologies are used for developing the virtual mouse. In this paper, we have tried to provide a review on different technologies for the virtual mouse.
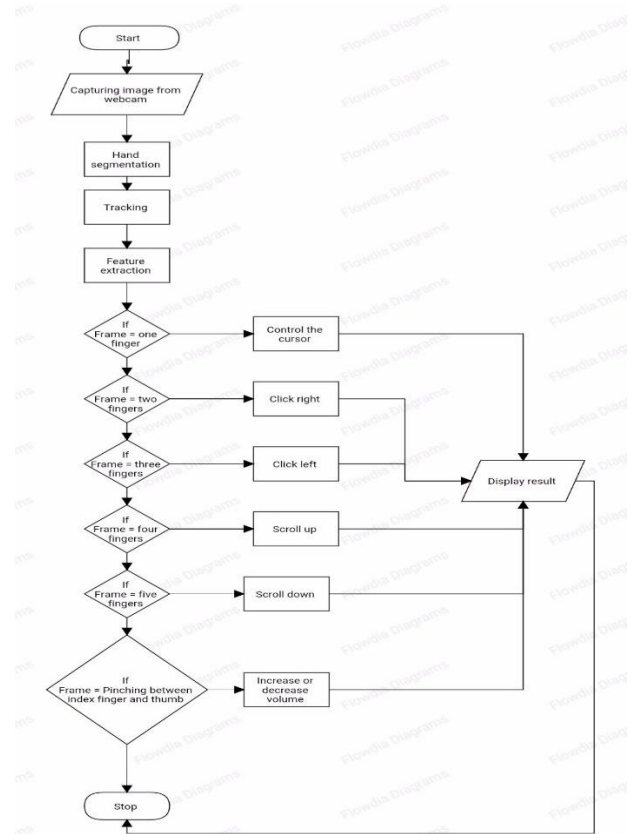
FLOWCHART:-

Fig. Flowchart

RESULT:

In this , we tried to implement all the mouse functionality and control using hand gesture.Our motive was to create this technology in the cheapest possible way and also to create it under a standardized operating system.The   system controls the functions of mouse pointer by detecting red, and perform the mouse functions such as left click, dragging, cursor movement, and the file transfer between two systems in a same network. Then the dropped file will be copied to the destination or the reciever system. This system is mainly aimed to reduce the use of hardware

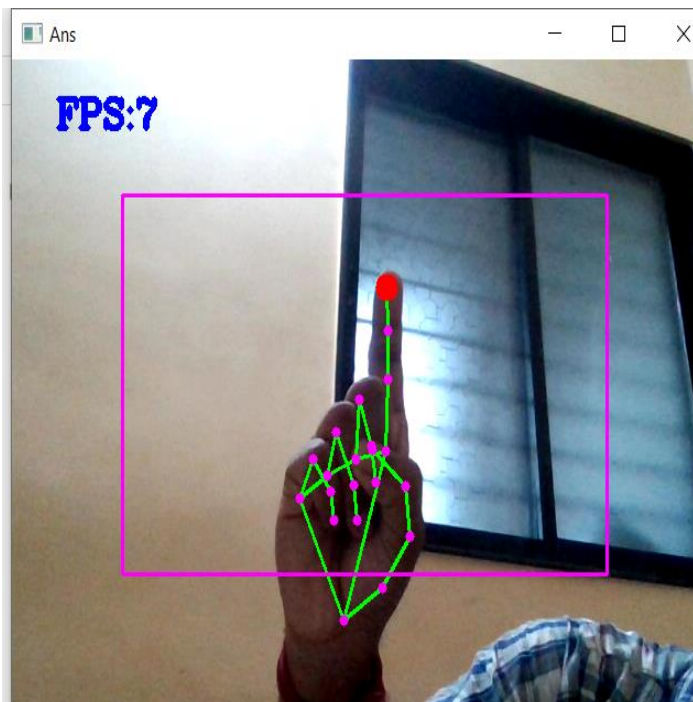components attatched with the computer. The application can be run in a ordinary computer having a web camera.
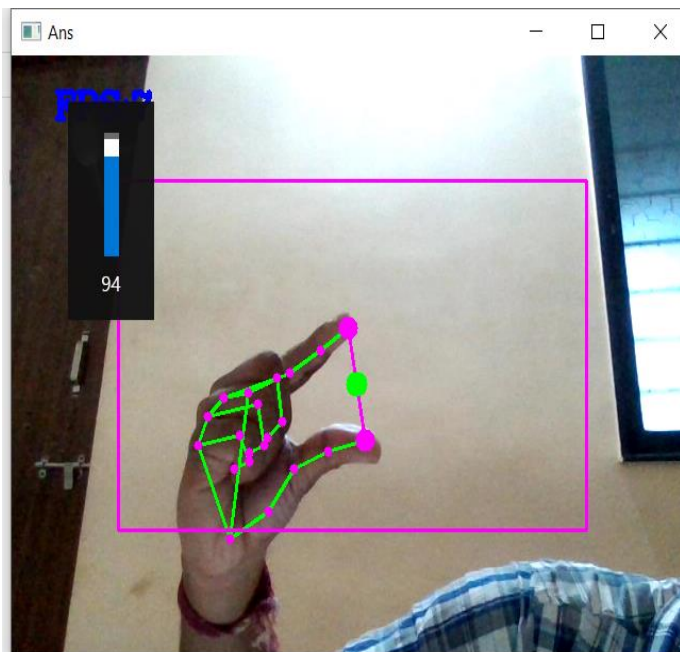

Fig. Control Mouse Cursor movement .

Fig. Volume control using thumb and index finger.

CONCLUSION:

From this project we can come up with an alternate solution for touchpads and traditional mouse. Using this model we have developed an application where we can control mouse with the hand movement and gestures for tasks such as mouse clicks, scrolling, zoom etc. The framework may be useful for controlling different types of games and many other applications dependant on the control of user like presentations, computers with multiple displays, media player control etc.

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