

“GESTURE IDENTIFIRE TO REMOVE MOUSE AND KEYBOARD”

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ABSTRACT

Hand gesture recognition is very significant for human-computer interaction. In this work, we present a novel real-time method for hand gesture recognition. In our framework, the hand region is extracted from the background with the background subtraction method. Today onward computer vision has reached its pinnacle, where a computer can identify its owner using a simple program of image processing. In this stage of development, people are using this vision in many aspects of day to day life, like Face Recognition, Color detection, Automatic car, etc. In this project, computer vision is used in creating an Optical mouse and keyboard using hand gestures. The camera of the computer will read the image of different gestures performed by a person's hand and according to the movement of the gestures the Mouse or the cursor of the computer will move, even perform right and left clicks using different gestures. Similarly, the keyboard functions may be used with some different gestures, like using one finger gesture for alphabet select and four-figure gesture to swipe left and right. It will act as a virtual mouse and keyboard with no wire or external devices. The only hardware aspect of the project is a web-cam and the coding is done on python using Anaconda platform. Here the Convex hull defects are first generated and then using the defect calculations an algorithm is generated and mapping the mouse and keyboard functions with the defects. Mapping a couple of them with the mouse and keyboard, the computer will understand the gesture shown by the user and act accordingly.

Keywords: Eye tracing, finger counter, hand tracing, virtual mouse, AI virtual keyboard, AI virtual mouse.

INTRODUCTION

- I. The Computer webcam is capturing the video of the person sitting in front of the computer, there will be a small green box which will be generated in the middle of the screen. In that green box, the objects shown will be processed by the code and matched with it if it matches then a red colored border will be generated, which means the computer has identified the object and then by moving the object the mouse cursor can be moved. This will not only help in the security of the computer but also help in generating a virtual computational experience. Here in the place of different objects, using hand gestures and movements of eyes. Right and left movement of eyes will be moving the cursor, the different gesture will be used for right click and different for left click, similarly with a simple gesture can do the keyboard functions virtually that may have been done on some keyboard as a physical aspect. If the gesture does not match the box will show an only green box when the known gesture is observed a red border will occur.

I.

RELATED WORK

1. Research on the “Hand Gesture Recognition Based on Deep Learning” Developed by Jing-Hao Sun, Ting-Ting Ji, Shu-Bin Zhang with the rapid development of computer vision, the demand for interaction between human and machine is becoming more and more extensive. Since hand gestures are able to express enriched information, the hand gesture recognition is widely used in robot control, intelligent furniture and other aspects.
2. Dynamic and Personalized Keyboard for Eye Tracker Typing Implemented by Kadir Akdeniz¹, Zehra Çataltepe¹, 2. aim is to Patients who suffer from Amyotrophic lateral sclerosis (ALS) or stroke cannot talk and express their everyday basic needs and requests. They can communicate using eye trackers since they can still use their eyes and sometimes move their heads.

3. Fully Imaginary Keyboard on Touch Devices Empowered by Deep Neural Decoder” Implemented by Ue-Hwan Kim , Sahng-Min Yoo , and Jong-Hwan Kim , Fellow, IEEE. Text entry aims to provide an effective and efficient pathway for humans to deliver their messages to computers. With the advent of mobile computing, the recent focus of text-entry research has moved from physical keyboards to soft keyboards.
4. Virtual Mouse Control Using Colored Finger Tips and Hand Gesture Recognition Designed by Vantukala Vishnu Teja Reddy 1, Thumma SD hyanchand 2, Galla Vamsi Kr-ishna.

ALGORITHM ARCHITECTURE

Type of algorithm:

1. LR is a supervised machine learning algorithm. Linear regression algorithm shows a linear relationship between a dependent (y) and one or more independent (x) variables, hence called as linear regression. Since linear regression shows the linear relationship, which means it finds how the value of the dependent variable is changing according to the value of the independent variable.
2. Haar Cascade is a computer vision algorithm. Haar Cascade classifiers are an effective way for object detection. Haar Cascade is a machine learning-based approach where a lot of positive and negative images are used to train the classifier.
 - **Positive images** – These images contain the images which we want our classifier to identify.
 - **Negative Images** – Images of everything else, which do not contain the object we want to detect.

Training:

1. LR requires a training dataset with labeled data to train the model.
2. Haar Cascade requires a training dataset with positive and negative samples to train the classifier.

Input and output:

1. LR takes a set of input features and produces a numerical output.
2. Haar Cascade takes an input image or video and produces a set of detected objects.

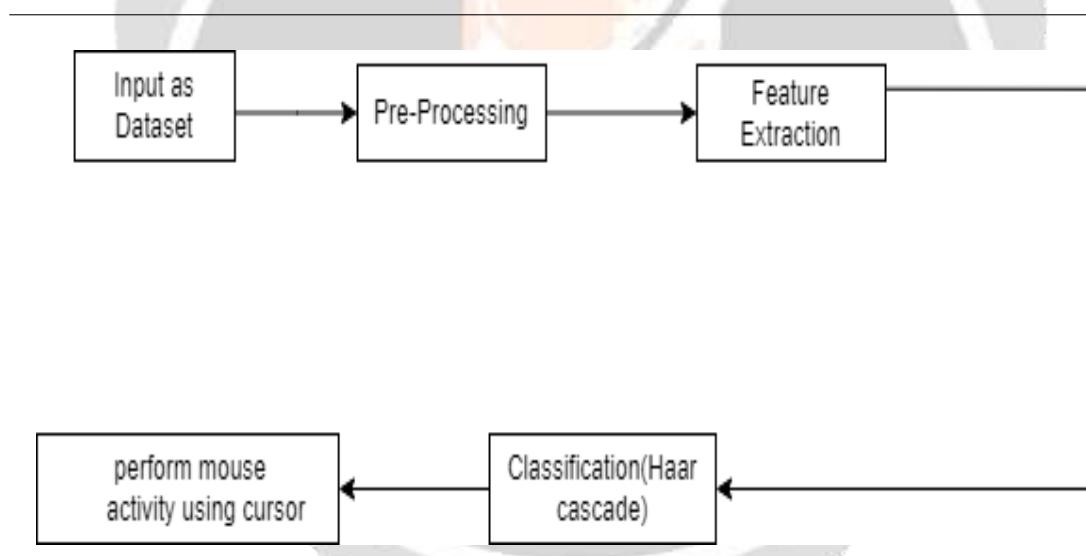


Fig. Flow Chart

METHODOLOGYS

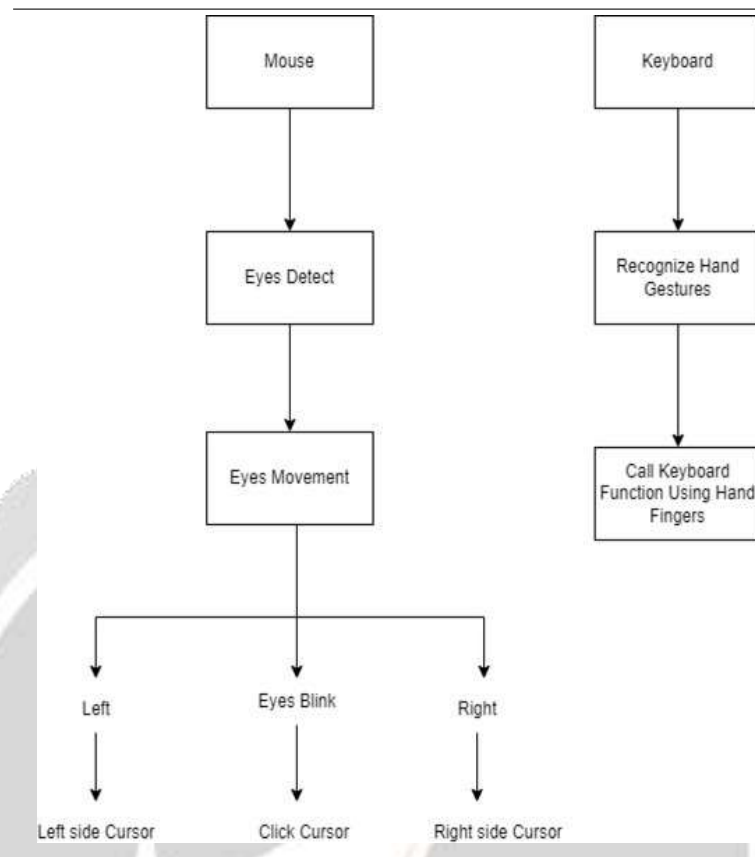


Fig. System Architecture

The proposed methodology for this project will involve the following steps:

Let S be the Whole system $S = \{I, P, O\}$ where,

I-input

P-procedure

O-output

Input (I)

$I = \{\text{Live Camera}\}$

Where,

Images -> live captured images

Procedure (P),

$P = \{I, \text{we take input from live camera and processing that data.}\}$

Output (O)-Detect hand gesture

RESULT AND DISCUSSION

The result of the study showed that all two machine learning algorithms (L.R. and Haar Cascade) were able to predict hand gesture and eyes movement with reasonable degree of accuracy.

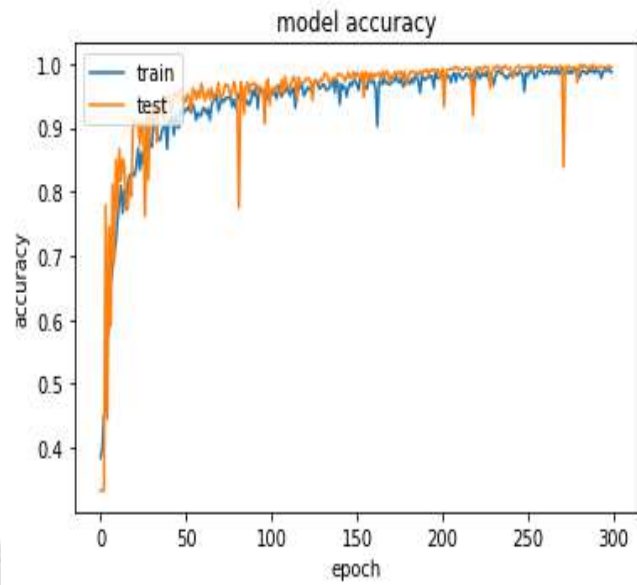


Fig. Accuracy Model

Based on these accuracy result we recommended that the use of our model is to removing keyboard and mouse due to its superior performance as compared to other models.

OUTPUT AND SCREENSHOTS

Registration page



Fig.9.1 Registration page

Login Page



Fig.9.2 Login Page

Output Page



Fig.9.3 Output page

Output Page

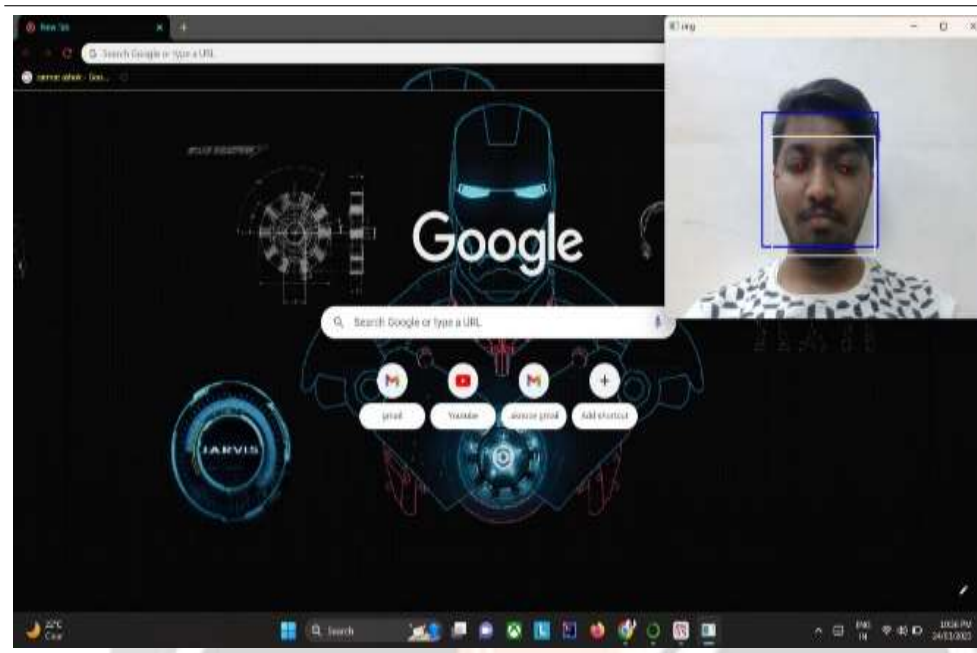


Fig.9.4 Output page

Output page

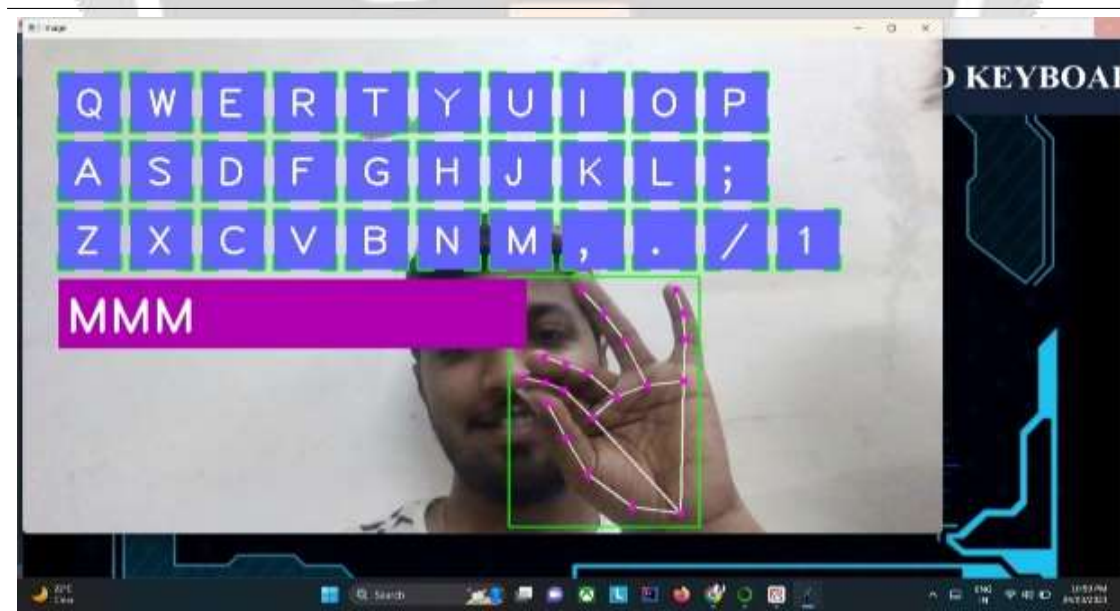


Fig.9.5 Output Page

CONCLUSION

This project is proposing a system to recognize the hand gesture and replace the mouse and keyboard function. That

includes the movement of the mouse cursor, the drag and click with the keyboard features like printing alphabets and other keyboard functions. The process of skin segmentation is utilized to separate the colour /image of hand with its background. Remove arm method, which effectively solves the situation of taking into the whole body into the camera. In general, the proposed algorithm can detect and recognize hand gesture so that it can operate mouse and keyboard features and also create a real world user interface. 3d printing, Architectural drawings and even doing medical operations from anywhere to everywhere. This project can be easily applied and its application can be very vast in medical science where computation is required but couldn't fully be implemented due to lack of human computer interaction.

FUTURE SCOPE

- Immediate and powerful interaction
- Unlike traditional buttons and menus, gestures do not interrupt the user's activity by forcing him to move his hand to the location of a command. Instead, they can be performed directly from the current cursor position.
- Hand Geometry is Simple and relatively easy to use for handle virtual mouse and keyboard.
- Inexpensive.
- Save time.
- Environmental factors are not an issue, such as, dry weather that causes the drying of the skin.
- Gestures feel very natural to perform since they mirror our experiences in the real world.
- To this project will Design and create a system which can identify Specific human gestures and use them to control.
- To in gesture recognition technology a camera reads the movements of the human body and communicates the data to a computer that uses the gestures as input to control devices of application.

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