Employing nonverble communication as a synthetic mouse and keyboard

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ABSTRACT: Today, computer vision has advanced to the point where a machine can recognise its owner by running a straightforward picture processing application. People use this vision in many parts of daily life at this stage of development, including face recognition, colour detection, automatic cars, etc. In this project, an optical mouse and keyboard are created utilising hand motions and computer vision. The computer's camera will capture images of various gestures made.

The computer's Mouse or cursor will move in response to a user's hand movements and gestures, even if the user is not using a computer.Use various movements to click to the right and left. Similarly, a variety of gestures, such as the one-finger gesture, can be used to access keyboard features.

KEYWORDS: Defects, Image Processing, Frame Extraction, Convex Hull

I.   INTRODUCTION

A small green box will appear in the centre of the screen while the computer webcam records video of the person using it while they are seated in front of it. The objects displayed there will be processed by the code and compared with it in that green box. If they match, a red border will appear, indicating that the computer has located the object. The mouse pointer can then be moved by dragging the object. This will contribute to the computer's security as well as the creation of a virtual computing environment.

Using hand motions, move the mouse and other items here in the places of various things.Right and left clicks will each require a distinct motion, and vice versa.A quick motion can perform keyboard operations virtually that would have been performed ona real keyboard is one example. If the gesture is incongruous, the box will indicate that.

II . PROPOSED SYSTEM

The Mouse uses a convex hull process for its working, defects are captured or read,using this defects the functions of the mouse are mapped. The process of this imagerecognition process solely focuses on defects and conditional statements, the convexhull takes the gap of the fingers as defects, so it can be used for multiple gestures andmapping commands.

The method employed for this keyboard function is slightly different from the Convex hull method; here, the hand position system is used, which means that the computer uses video to record the hand position. A tiny virtual keyboard is allocated to the active video window. Using the hand position technique, the keyboard functions that have been mapped can be chosen and then executed. A math function is then used to determine the hand's position and convert it to a matrix location that the computer can recognise.

III .SYSTEM ARCHITECTURE
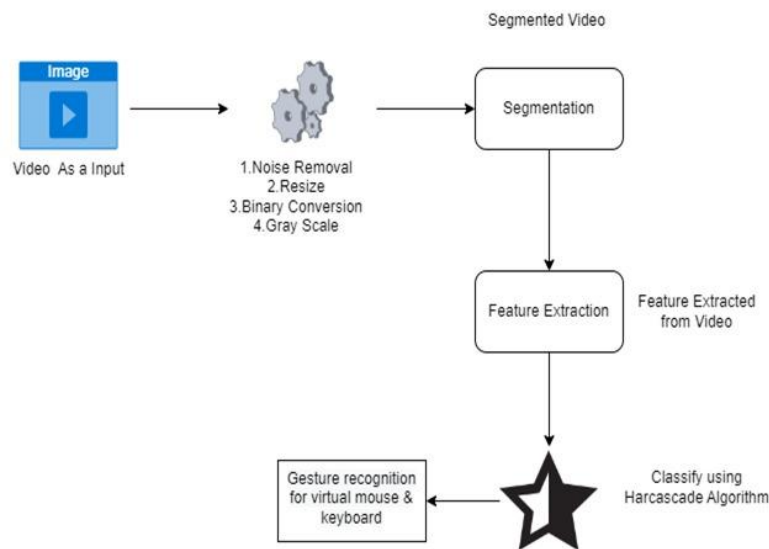
• Pre-processing

Data that has undergone preliminary processing in order to be ready for primary processing or for analysis. The phrase can be used to describe any initial or preliminary processing step when preparing data for the user requires numerous steps. Preprocessing procedures could include, for instance, extracting data from a bigger collection, filtering it for specific criteria, and combining data sets.

• Segmentation

The division of a video sequence into discrete groups of consecutive frames that are homogeneous in accordance with predetermined criteria is known as video (temporal) segmentation. The most popular segmentation techniques divide video into shots, camera-takes, or scenes.

• Feature Extraction

The technique of turning raw data into numerical features that can be handled while keeping the information in the original data set is known as feature extraction. Compared to using machine learning on the raw data directly, it produces better outcomes.

• Classification

The classifier is trained using a large number of both positive and negative images in the Haar Cascade technique, which is based on machine learning. Positive images - These pictures include the pictures that we want our classifier to be able to recognise. Negative images are pictures of everything else that don't include the thing we're trying to find.

IV. CONCLUSION

This proposal suggests a system that would recognise hand gestures and take the place of the keyboard and mouse. This covers mouse cursor movement, keyboard drag-and-click actions, and other keyboard functionality like printing alphabets. The skin segmentation technique is used to isolate the hand's colour and picture from the background. Remove-arm technique, which successfully addresses the issue of putting the entire body in front of the camera.

The suggested method can generally detect and understand hand gestures, allowing it to control keyboard and mouse functions and produce a real-world user interface. 3D printing, architectural renderings, and even performing medical procedures remotely. This project is simple to construct, and it has a wide range of potential applications in the field of medicine where computing is necessary but has not yet been completely realised due to a lack of human-computer connection.

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