International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 04 Issue: 04 | April -2020 ISSN: 2582-3930

ACCESING MOBILE HARDWARE STATE USING HAND GESTURE

V.Pushpalatha, Department of Computer Application,
Mr.R. Sathish kumar, MCA,M.Phil., Assistant Professor,
Krishnasamy College of Engineering and Technology, Cuddalore

ABSTRACT

Hand gesture recognition is a technology that is becoming increasingly relevant, given the recent growth and popularity of Virtual and Augmented Reality technologies. It is one key aspect to HCI, allowing for two-way interaction in virtual spaces. However, many instances of such interaction are currently limited to specialized uses or more expensive devices such as the Kinect and the Oculus Rift. In this paper we explore the methods for hand gesture recognition using a more common device – the laptop web-camera. Specifically, we explore and test 3 different methods of segmenting the hand, and document the pros and cons of each method. We will also cover one method for hand gesture recognition.

Our algorithm works as follows:

- Webcam video is captures using mobile camera capture
- It is broken up into continuous image frames
- Each frame is converted to grayscale
- Each frame is now scanned to check five finger design pattern
- Once detected it is flagged as an object
- System now tracks its movement within particular frame
- This is tracked in terms of x,y coordinates

These x, coordinates are now mapped to access mobile hardware and change their state. For eg, if Bluetooth state is ON, it will be changed to OFF.

MODULES

1. **Skin Detection**
2. **Hand Contour Extraction**
3. **Hand Tracking**
4. **Gesture Recognition**

Module Description

➢ Skin Detection:

Skin detection can be defined as detecting the skin color pixels in an image. It is a fundamental step a wide range of image processing application such as face detection, hand tracking and hand gesture

recognition. Skin detection using color information has recently gained a lot of attention, since it is computationally effective and provides robust information against scaling, rotation and partial occlusion. Skin detection using color information can be a challenging task, since skin appearance in images is affected by illumination, camera characteristics, background and quality.

➢ Hand Contour Extraction:

After getting the skin segmented binary image, following step is to perform edge detection to get the hand contour within the image. There are many edge detection strategies like, laplacian edge detection, canny edge detection and border finding The Open CV function cvFindContours() uses a order findig edge detection technique to search out the contours within the image. The main advantage of the border finding edge detection technique is that each one the contours found within the image is keeping in an array.

➢ Hand Tracking:

The movement of the pointer was controlled by the tip of the finger. so as to spot the tip of the finger, the centre of the palm should first be found. the strategy used for locating the hand centre was adopted from and it has the advantage of being straightforward and easy to implement. The shortest distance between every point inside the inscribed circle to the contour was measured and the point with the largest distance was recorded as the centre. The space between the center of hand and the hand contour was taken as the radius of the hand. The hand centre was calculated for every consecutive frame and using the hand centre, the tip of the finger would be known and used for hand tracking.

➢ Gesture Recognition:

The gesture recognition technique used in the proposed design is a combination of two methods, proposed by Yeo and also the method proposed by Balazs. The convexity defects for the hand contour must first be calculated. The convexity defects for the hand contour was

calculated using the OpenCV inbuilt function "cvConvexityDefects". The parameters of the convexity defect (start point, end point and depth point) are kept in a sequence of arrays. When the convexity defects are obtained, there are two main steps for gesture recognition:

1. Finger tip identification
2. Number of fingers.

TES TING

In this application it was done by using IP Web Cam Android application. The application uses the camera present in the phone for continuous image capturing and a simultaneous display on the screen of the testing frame in server. The image captured by the application is streamed over its Wi-Fi connection (or WLAN without internet as used here) for recognition. The program access the image by logging to the devices IP, which is then showed in the GUI. Basic resize of original image is carried out in original image.

Training database

Existing System

Computer technology has enormously grownup over the past decade and has become a necessary a part of everyday live. The first accessory for Human Computer Interaction (HCI) is that the mouse. The mouse isn't appropriate for HCI in some reality things, like with Human Machine Interaction. There are several researches on different ways to control the Personal Computer mouse for HCI. The foremost natural and intuitive technique for HCI, that's a viable replacement for the Personal Computer mouse, is with the utilization of hand gestures.

Disadvantages

- It requires a lot of memory.
- The alarm it has limited accuracy.

Proposed System

The proposed system is vision based, that uses image processing techniques and inputs from a computer or laptop camera. The input frame would be captured from the digital camera and system is broken down into four stages, skin detection, hand contour extraction, hand the skin region would be detected victimization skin detection. The hand contour would then be found and used for hand trailing and gesture recognition. Hand trailing would be used to navigate the Personal Computer pointer and hand gestures would be used to perform mouse functions like right click, left click, scroll up and scroll down. The scope of the project would thus be to design a vision based CC system, which can perform the mouse function previously expressed.

Advantages

- The system is easy to install.
- It can be used as easy mouse control for users.
- It is not an electronic based system so one can easily make use of laptops to install this system.
- It is cost-effective.
- It maximizes accuracy and reduces energy usage.

Conclusion

This system a hand free interface, based only on human gestures, where no devices are attached to the user, will naturally immerse the user from the real world to the virtual environment. It is useful for communicating with a deaf and dumb person. The system database has sign gestures of size of 176X144 pixe ls so that it takes less time and memory space during pattern recognition. Android camera helps in capture of image and is stored in mobile database. In server database a collection of hand gesture is images are stored for future recognition. The project opens up the possibility of intuitively indicating objects and locations, e.g., to make changes in direction of robot movement or to simply mark some object. This is particularly useful in combination with speech recognition and can be used to specify parameters of location in verbal statements. This work briefly describes the schemes of capturing the image from android device, image detection, processing the image to recognize the gestures as well as few results.

REFERENCES

[1] Zhiyuan Lu, Xiang Chen, Qiang Li, Xu Zhang **" A Hand Gesture Recognition Framework And Wearable Gesture-BasedInteractionPrototypeForMobileDevices"**IEEETransactionsOnHuman-MachineSystems,Vol. 44, No. 2, April2014.

[2] Ankita Saxena,Deepak Kumar Jain,Ananya Singhal**"Hand Gesture Recognition Using An Android Device"** Fourth International Conference On Communication Systems And Network Technologies,2014.

[3] Jonghwa Kim, Stephan Mastnik, Elisabeth André **"EMG-Based Hand Gesture RecognitionFor Realtime Biosignal Interfacing"** IUI'08, , Maspalomas,, Spain, January 13-16,2008.

[4] Ming Ki Chong, Ga ry Marsden, Hans Ge llersen **" Gesturepin: Using Discrete Gestures For Associating Mobile De vices"** Mobilehci'10, Lisbon, Portugal September2010.

[5] Ruize Xu, Shengli Zhou, And Wen J. Li" **MEMS Accelerometer Based Nons pecific-User HandGesture Recognition"** IEEE Sensors Journal, Vol. 12, No. 5, May 2012.