

Convenience Improvement for Graphical Interface Using Gesture Detection

Dnyandev Sopan Musale¹, Prof. Shaikh I.R.²

¹Student ME, Department of Computer Engineering, SND College of Engineering and Research Center, Yeola.

²HOD, Department of Computer Engineering, SND College of Engineering and Research Center, Yeola.

Abstract - the way for getting data from web such as weather condition, market condition, sports news, financial information and other information from different newspaper, Television and Internet. Now a day people interact with the system through graphical user interface which uses input devices like keyboard and mouse which is inconvenient and time consuming. To overcome this issue we design convenient GUI using hand gesture for getting data or information without using input devices like mouse and keyboard. The main aim of the proposed system reduce the disadvantages of existing system for accessing data or information from World Wide Web (internet) using hand gesture. In this we passes trainee images data captured by web cam to the system for processing then hand gesture get recognized by the system and our system also tied with world wide web so we are able to access required information or data from web and our system cant required input mechanism

Key Words: Gesture Recognition, Hand Gesture, Hand Segmentation, Image Acquisition, and PCA.

1. INTRODUCTION

Gesture recognition is nothing but Human computer interaction (HCI) [7]. We can also define Gestures to convey meaningful information by the body or physical action from user and process of recognition of body or physical action called Gesture recognition. Gestures are divided in two types static and dynamic [8]. Hand gesture is used in wide area by computer vision and machine eye with development of different tools and realization of virtual environment. in this paper we present human computer interaction through convenience graphical interface using gesture detection. When we study the hand gesture recognition it is changes from person to person so result may be changed with different as texture and skin tones changes. It is universally accepted that every person has same hand and figure count as normal consideration. The main aim of the proposed system reduce the disadvantages of existing system for accessing data or information from World Wide Web (internet) using hand gesture. In this we passes trainee images data captured by web cam to the system for processing then hand gesture get recognized by the system and our system also tied with world wide web so we are able to access required information or data from web and our system without keyboard and mouse.

2. LITERATURE SURVEY

In early days Gesture Recognition becomes very prevail process. For determining hand gesture different gesture recognition technique are used. And every technique has its own positive and negative consequences. The old technology is wired technology in which user get connected with computer system through wire. But this technology has several limitation of the length of wire that's why user cannot freely move in room. The data gloves or instrumented gloves also called electronics gloves is the example of wire technology [1][2]. Sensors are required for creating electronics gloves for tracking Finger position orientation and hand location. These instrumented gloves provide best result but because of expensive cannot use in common application. So we get replace electronics gloves by optical markers this is one way to overcome expensiveness. Optical markers produce infra-red light and this light reflect on screen to getting information about tips of finger or hand location. Optical marker also provides good result but again it has some pros and cons i.e. complex configuration. After that advanced technique get introduce called image based technique in which image features like color, texture get processed. We work with these features of the image for hand gesture recognition. For Study Hand gesture and recognition system can be divided into different parts hand detection, hand recognition and data retrieval from web.

2.1. Hand Detection

In Hand detection phase input is taken in the form of images or video stream captured by webcam after that these images are passed to the system for image processing and then with take precaution of time consuming. For hand detection multiple methods or approaches are used. The easy way is taking image as input and finding skin color region, but it is a difficult task as it has background color detection and another body parts as image skin color is detected by using skin color detection algorithm.

2.2. Hand Recognition

Hand gesture recognition deals with features detection and Second parameter estimation model calculation. In features detection extract features from images which are useful after that from this features calculate parameter by parameter estimation model. In Hand gesture recognition segmentation is done as there are unwanted background objects. For hand locating segmentation based skin color method is applied.

In this accuracy can be maintained because of gesture parameter features are properly selected by recognition process. After selection of hand gesture system is able to get data from web or internet from respective gesture.

2.3. Data Retrieval

In information or data retrieval phase the data can be retrieved from internet according to provide gesture. User fixes URL for per gesture in a database and when gestures are recognized according that gesture users call that URL from database. In this way information can be accessed using gestures from web.

3. Proposed System

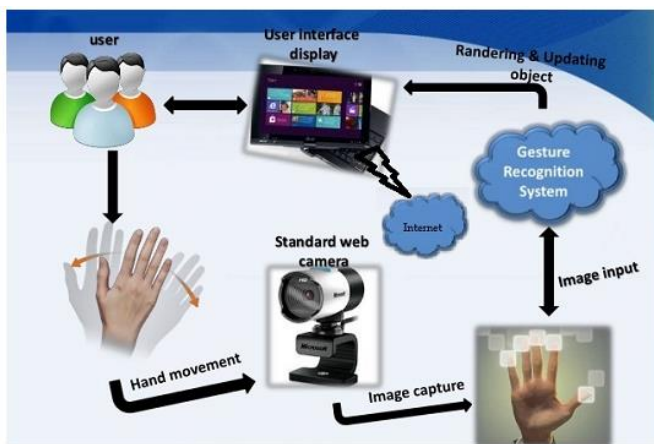


Fig -1: System architecture

3.1. Image Acquisition

Images are acquired using the 13 megapixel real-aperture camera in controlled background as well as by varying the lightning conditions.

3.2. Hand Segmentation

The main and basic step in hand gesture recognition is to segment the hand from the whole image so that it can be utilized for recognition. In our proposed color skin color segmentation is applied to segment the hand. As skin color of different person can vary and background image can also contain the skin pixels so after skin color model Otsu Thresholding is applied to remove the background. Conversion from RGB to YCbCr: The proposed skin color segmentation in applied to YCbCr color space.

3.2. Gesture Recognition

One of the important technique of recognition is template matching in which a template to recognize is available and is compared with already stored template. In our approach PCA method for feature extraction and matching is used. Principal Component Analysis: PCA is used to reduce the

dimensionality of the image while preserving much of the information. It is the powerful tool for analyzing the data by identifying patterns in the dataset and reduces the dimensions of the dataset such that maximum variance in the original details visible in reduced data. PCA was invented by Karl Pearson in 1901. It works by converting set of correlated variables to linearly uncorrelated variable called principal components. Principal components are calculated by computing Eigen vectors of covariance matrix obtained from the group of hand images. The highest M eigenvectors contains the maximum variance in the original data. These principal components are orthogonal to each other and the first component is in the direction of greatest variance.

4. SYSTEM ANALYSIS

We required laptop with dual core having 2GB RAM with webcam. Using webcam images are captured with resolution 640 x 480. We tested proposed system with 10 URLs with 10 different hand gestures. We determine 10 gestures, 10 images taken for each gesture means we have 100 images with eliminating background disturbance and tested the accuracy rate in real time environment as shown in following tables

Table -1: Hand Reorganization Result for data retrieval

Hand Reorganization Result			
Gesture	Input images	Successful cases	Recognition Rate %
1	10	8	80
2	10	9	90
3	10	9	90
4	10	10	100
5	10	8	80
6	10	10	10
7	10	9	90
8	10	9	90
9	10	10	90
10	10	9	90
ALL	100	90	90%

3. CONCLUSION

The proposed system implemented convenience graphical interface using hand gesture detection which is used to getting data from web. It is cheaper as compare to touchpad. We are getting data from web successfully by this system. As we tested the accuracy rate in real time environment is also good i.e. 90% and good fluency of controlling the system. For future work we can increase the hand gesture recognition accuracy rate.

ACKNOWLEDGEMENT

I have great pleasure in expressing my sincere thanks to Dr H. N. Kudal Principal, S. N. D. College of Engineering, Yeola for providing all the necessary facilities. I wish to express my great thanks to my guide Prof. I. R. Shaikh Head of Computer Engg. Department, encourage me throughout the project. I wish to express my sincere thanks to Co-ordinator, post graduate programme Prof. V.N. Dhakane Computer Engg. Department for his valuable suggestions and guidance. I am grateful to the staff members of the Department of Computer Engg. for their stretching hands of the successful completion of this paper work. At the last but not least, I am thankful to my parent who had encouraged inspired me with their blessings.

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