Hand Gesture Recognition using Webcam

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Abstract— In Human-machine interfaces are playing a role of growing importance as computer technology continues to evolve. Keyboards have been replaced by handwriting recognition in Palm and Pocket PC PDAs. Motivated by the desire to provide users with an intuitive gesture input system, we developed a system Human Gesture Recognition to recognize hand gestures representations. Gesture refers to a particular pose and/or movement of the body parts, such as hand, head, face etc., so as to convey some message. Accordingly, one important direction of research in gesture recognition is concerned with hand gestures formed by different hand shapes, positions, orientations and movements. While static hand gestures are modeled in terms of hand configuration, as defined by the flex angles of the fingers and palm orientation, dynamic hand gestures include hand trajectories and orientation in addition to these. So, appropriate interpretation of dynamic gestures on the basis of hand movement in addition to shape and position is necessary for recognition.

Key words: Human-machine, Human Gesture Recognition, handwriting recognition

I. INTRODUCTION

A. *Problem Statement:*

Human Gesture Recognition is designed in order to cater the need of fast growing world to minimize the hardware caring burden. It is basically prevents from carrying desktop, laptop or any other devices without any carrying load.

B. *Problem Solution:*

Sixth sense technology can able to provide the wearable digital device which can able to solve the problems faced by present technologies.

C. *Need of Project:*

User must have to wear the color bands on finger tips. It is crucial for working of the project. And also camera, projector and smart phone are required.

D. *Project Objectives:*

There are following objectives meet by project.

1) To provide user wearable device which can fulfill all the requirements of the desktop, laptop and any other communicative device.
2) To avoid traditional machine seat out system.
3) For this surface does not matter.
4) To provide user more portable device.
5) If you are using the sixth sense technology then, you can get any information of anything around you.

II. EXISTING SYSTEM

Now a days the Microsoft surface, sticky notes, touch screen, multi touch screen etc. technologies are present but, then cannot fulfill all the requirements of the user means the Microsoft surface have no portability, as sticky notes also fails when we want to take out some image .In market there are the touch screen devices are present but, they are not as fast as the sixth sense, they requires the more time for the processing. So that, these devices are less user-friendly.

III. PROPOSED SYSTEM

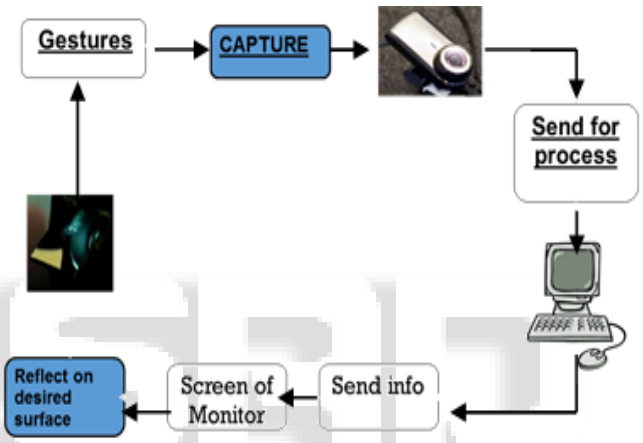

Fig. 1: Block Diagram of project Working

1) Hand gestures are given by the user to the web camera
2) Werb camera captures the gestures and process them to match with the database
3) Appropriate action is stored for each gesture
4) Result is shown on the screen

EX. Suppose programmer stored gesture 'M' for media player then Media player will open.

A. *Initial Process:*

The information domain consists of three different views of the data and control and each is processed by computer program. Information content and relationships for this we collected specific need about the requirements of the customer, jotting down the field names and functionalities of the system.

1) Human-Machine:

Human-machine interfaces are playing a role of growing importance as computer technology continues to evolve. Keyboards have been replaced by handwriting recognition in Palm and Pocket PC PDAs. Motivated by the desire to provide users with an intuitive gesture input system, we developed a system to recognize hand gestures representing letters of the alphabet. Previous attempts to develop hand gesture recognition systems employed geometric feature-based methods, template-based methods, and more recently active contour and active

statistic models. The hand gesture is captured in a video stream. Each video sequence is composed of 25 frames. Skin colour segmentation based on a YUV colour space is applied to locate the hand. Pre-processing (morphological) operations is used to smooth the image and remove noise before tracking the hand with a modified Camshift algorithm . After segmenting the hand, we calculate image moments to find the hand centroid in each frame.

B. Information Domain:

Body language is an important way of communication among humans, adding emphasis to voice messages or even being a complete message by itself. Thus, automatic posture recognition systems could be used for improving human-machine interaction. This kind of human-machine interfaces would allow a human user to control remotely through hand postures a wide variety of devices. Different applications have been suggested, such as the contact-less control or home appliances for welfare improvement. Moreover In order to improve the lip-reading efficiency Dr. Cornett developed the Cued Speech. He proposed to add manual gestures to lip shapes so that each sound has an original visual aspect. Such a "hand & lip-reading" become as meaningful as the oral message.

IV. CONCLUSION

This project presents a system for hand gesture trajectory estimation and letter gesture recognition. An efficient segmentation and smoothing method is used to extract the trajectory of the hand movement. The Blob algorithm used for applications for the detection of the pixels around COG of color tips. Due to the sixth sense user can be always touch up with digital system. A fast processing process and a robust matching carried out through this approach; visual memory system and resolution of non-rigid distortions have been presented for hand posture detection and recognition problem. Different light conditions, backgrounds and human users have been tested in order to evaluate system's performance.

The recognition rates show that the system is robust against similar postures. Even more, the runtime behavior allows the use in real-time video applications with a simple personal computer and a standard USB camera. Future research will concentrate on investigating efficient hierarchical N-template matching and studying other robust and efficient methods about face and hand location in order to integrate the components of the system into a gesture interface for an anthropomorphic autonomous robot with an active vision system and into virtual environment applications.

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