Hand Gesture Recognition System for Daily Information Retrieval

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ABSTRACT: The aim of this paper is to develop interface that can be connect to digital world to physical world. Now people are used keyboard and mouse to get daily information from internet such as daily news, financial news, weather etc. To improve these situations proposed system user can interact with system by using hand gesture. System can give hand gesture as input. Once system get particular hand gesture as input, the system will report information from internet as a output from system to user. It takes video stream as input and system having predefined hand gestures. When it recognizes the gesture, system stimulates the appropriate action associated with particular gesture.

KEYWORDS: hand detection, Hand gesture recognition, hand tracking, information retrieval.

I. INTRODUCTION

Nowadays people usually have daily information from newspaper, elevation and Internet. As Internet is more developed and widely available elsewhere, the future of Internet must be major source to access the vast amount of information. Daily information such as weather, news and fortune information are most common ones. Though, these daily information has to repeat the same mouse and keyboard actions, and consequently, it wastes time and many inconvenience are present. In order to improve all these situations, we present in this paper the design of a system that can easily access daily information without mouse and keyboard actions and making people's life convenient.

Today in the information age computer has become an integral part of every body's life. We use a computer to hear songs, read something, accessing information from the internet.The computer handling and accessing information has to be done with the mouse and keyboard. Everything has to be told to it by using keyboard and mouse which makes the information access part a tedious one and a lot of time is wasted on just telling it how an information can be retrieved if it is retrieved daily which it tiresome and boring. Today hand gestures or any gesture used in information access can make a system intelligent enough to perform the task given to it by just a gesture and not by using keyboard and mouse.

This kind of human machine interface would allow a human user to control remotely through hand gesture a wide variety of devices. Different applications have been suggested, such as contactless control or house appliances for welfare improvement. A new vision based framework is presented in this method, which allows the users to interact with computers through hand gesture, being the system adaptable to different light conditions and backgrounds. Its efficiency makes it suitable for real time applications.

The aim of proposed system daily information accessed from internet by using hand gestures. These hand gestures captured by camera. The data recorded from camera send to pc for image processing. Hand gesture is recognized in pc and it is coupled with internet. So user can access information by using hand gestures. Gesture recognition is technology that achieves human machine interactions that do not require contact based input mechanisms like remote, mouse, keyboard etc.

II. RELATED WORK

In hand gesture and recognition system there are three phases hand detection, hand gesture recognition and information retrieval from internet

A. Hand Detection:

For hand detection image is taken from camera. System takes a video stream as input. This image processed in system. The operators used for image processing must be kept low time consuming in order to obtain the fast processing rate needed to achieve real time speed.

There are many approaches for hand detection. The simple way to detect hand is capture image and find for skin color region in the image but skin color region detection is difficult because it can also detect background color and other body parts from image. The camera is used to track the hand movements. So we use the skin color detection algorithm for skin color detection.

B. Hand Gesture Recognition:

In hand gesture recognition two phases are important, firstly features detection which relates with the extraction of useful features from input video or input image, Secondly, relates with calculation of parameters estimation model from the extracted features.

Hand gesture can be localized by detecting the hand gesture from the image and segmenting hand from the background which is the unwanted other objects. Skin color provides an effective and efficient method for hand localization. Segmentation based skin color method applied for hand locating. Recognition process affected with the proper selection of gesture parameters of features and thus the accuracy of the classification. For example edge detection and counter not suitable for gesture recognition since it might lead to misclassification. Edge detection algorithm is applied on the image captured by camera. These algorithms detect which gesture is selected. Once you select hand gesture system retrieves the information from internet with respect to hand gesture.

C. Information Retrieval:

When request for data, information retrieval process is used to collection of data from internet. Once particular hand gesture is recognizes then query is enters into system. The URL for accessing information is predefined by the user. For different hand gesture different URL's are save in the system. Once URL is selected for first time then information is retrieved from internet using hand gesture.

III. ARCHITECTURE

The environment of this proposed system is built in home environment and provides daily information. A camera is the major hardware component of system. Camera is used to captures the hand movements. These images are sending to PC for image processing. Image is processed in PC i.e. hand is detected and gesture is recognized from the image. With respect to hand gesture information is retrieved from the internet. These information displays on the PC. If hand gesture does not identified then camera captures the images until gesture recognizes.
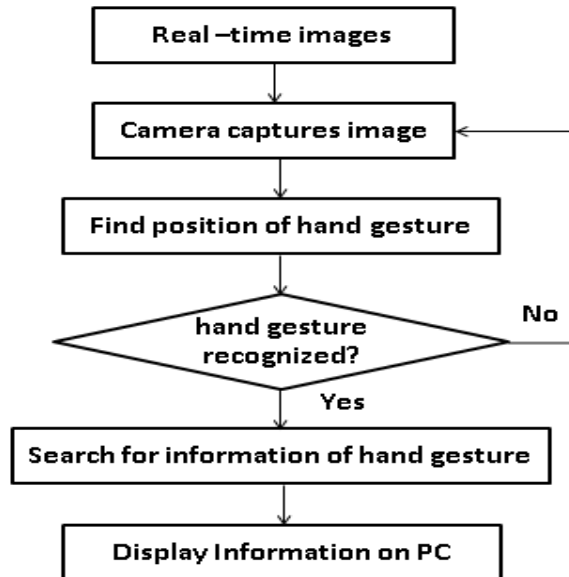
Fig. Proposed System

IV. WORKING

In this concept the information is retrieved from internet using by hand gesture. An input is taken from camera. Camera captures the images and captured images are taken to processing. Processing means to identify hand gesture. For identifying hand gesture various algorithms are used. In this first we use skin color detection algorithm for detecting hand but it difficult to detect hand because sometimes this algorithm detects background color or background in the image as a skin color. Another algorithm is to detect edge from the image to identify gesture. Counting algorithm is used in gesture recognition process. If gesture is recognized then system goes for further processing i.e. collecting information from internet displays them on user's pc. If hand gesture does not recognize then system goes for capturing images until system recognize gesture.
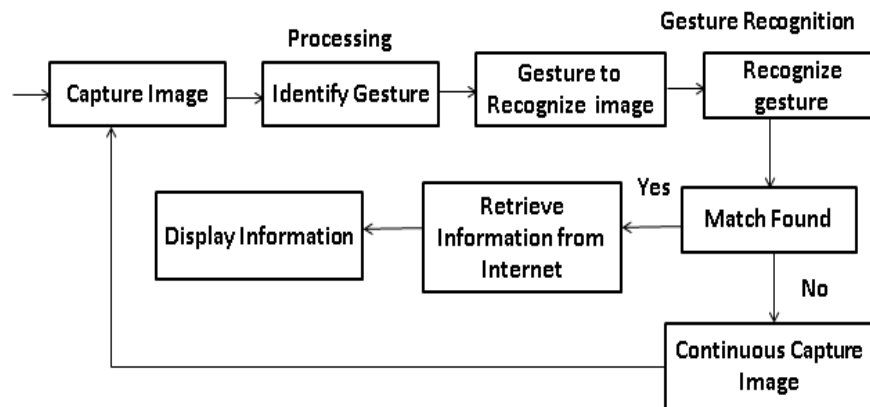

Fig. Working of System

V. EXPERIMENTAL RESULTS

The equipment's include a laptop. Configuration of laptop is intel dual core processor with 2 GB RAM memory. The Web Cam is used to capture image. The captured image size is 640 x 480 resolution. Our system interface provides five links that can be choose by hand gesture. The links are i.e. news, election news, gmail, cricket score, weather information retrieval.

The normalised image isdown sampled from the original from the original image by using skin detection. We can find biggest skin region. In our project five defined hand gesture. Our hand gesture are one, two, three, four, five. User can use any hand gesture to choose function. The one, two, three, four, five correspond to news, election news, gmail, weather, cricket score. On hand gesture picture test accuracy rate is good in static environment.

We start to test hand gesture recognition accuracy rate in real time environment. In our experiment hand gesture has 100 frames to recognize. The total time for processing a single frame is between 0.2 to 0.4 seconds. About 50ms to 1 seconds for hand detection and 10ms to 80ms for hand gesture recognition. Total hand recognition accuracy rate is 86.5.

	One	Two	Three	Four	Five	Total
Accuracy Rate	90.5	86	93.8	81.9	80.4	86.5

VI. APPLICATIONS AND FUTURE WORK

Applications of a sophisticated temporal-gesture detection and recognition system are myriad: we enumerate some of the more salient areas of research and development.

A. Sign Language Recognition

Sign language recognition plays an important role in deaf and mute individual's life. So gesture recognition system translates sign language into text. By using gesture recognition system these peoples easily interact with digital work.

B. Robotics

Hand gesture recognition system also used in robotics. Using gesture recognition system and sensors movements of robot takesplace. Hand gesture also used for to give command to the robot.

C. Remote Control for Games and Hardware

Gesture can be used to control interaction within video games to try and make the game players experience more interactive.

D. Home Environment

For daily information retrieval which is efficient way to get information using hand gesture. Different applications suggested such as contactless control or home appliances

We are also interested to work in lip reading technology to make life easier. Lip reading and gesture recognition is helpful for deaf-mute people.

VII. CONCLUSION

In this paper we have implemented how to interact with physical world using hand gestures. The system provides an interface that can easily get daily information by hand gesture recognition. The system is not only can apply in family environment, but also can apply in public. In public, every user can get information from this system by hand gesture, and the cost will cheap than touchpad.We are successfully retrieve daily information from web using hand gesture recognition system.

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