Hand Gesture Control Media Player

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ABSTRACT

Motion is a most ideal approach to offer contribution to the gadget. Motion is a standout amongst the most distinctive and emotional method for correspondences amongst human and PC. Hence, there has been a developing enthusiasm to make simple to-utilize interfaces by straightforwardly using the common correspondence and administration abilities of people. This application contains a focal calculation module which portions the frontal area part of the edge utilizing skin discovery and inexact middle strategy. The acknowledgment of signal is finished by making a Decision Tree, which utilizes different components extricated from the fragmented part.

Keywords : Gesture, Decision Tree, Skin Detection, Recognition, Communication

I. INTRODUCTION

Image processing closely related to computer vision. PC vision is the development of unequivocal, significant depiction of unmistakable and noticeable element from their picture. Sub range of PC vision incorporates remaking, occasion location, motion acknowledgment, movement estimation, recognition and so on.Picture division is the way toward parceling of picture into its constituent segments and significant areas as indicated by their indistinguishable arrangement of properties or qualities. Division assume extensive part in motion acknowledgment. Gesture acknowledgment is in software engineering and dialect innovation with objective of translating human signal by means of strategy and calculations Hand motion acknowledgment is one of the exceptionally dynamic research regions in the PC vision field. Hand signal is a high useful esteem non-verbal communication that its particular significance is built up through our dialect focus by palm and finger position and shape. Customarily the applications proposed for signal acknowledgment for the most part requires confined foundation, set of motion summon and a camera for catching pictures.

Signal acknowledgment empowers people to speak with the machine (HMI) and connect normally with no mechanical gadgets. Utilizing the idea of motion acknowledgment, it is conceivable to point a finger at the PC screen so that the cursor will move appropriately. This could conceivably make routine information gadgets, for example, mouse, Keyboards and even touch screens excess. Signal acknowledgment can be directed with systems from PC vision and picture handling.

II. RELATED WORKS

Druva N.[1]in this paper they investigated the different conceivable methods for division utilizing distinctive shading spaces and models and gives most noteworthy precision. So the division depended on various shading spaces. In this paper authors compare RGB, Y'CbCr and

HSI color spaces. Pictures acquired from the camera in RGB shading spaces.

RGB shading space is primary color space since it primary colours red, green and blue as its color components.In digital cinematography is Y'CbCr color universe which contain Y' or luma component which depict splendor, Cb is portray blue distinction chroma and Cr is depict red contrast chroma part.

H or Hue portrays essential shading, S or Saturation describes as total amount of color and I or Intensity is described total measure of light intensity.Clearly seen from authors result that HSI model would greatly benefit so as to segment the hand and fingers. Future work include robust video processing algorithm to identify various gesture and keep memory of database minimal.

Jayshree R. Panesara[2] in this paper creators depict constant framework for HCI through motion acknowledgment for ISL. They characterize the mostly four phases-

1. Image pre- RGB shading space picture changed over into YIQ space pictures ,2.Utilizing dim edge to discovery the skin shading., 3. In area extraction, remove hand locale utilizing blob for getting ROI. 4. In highlight extraction, remove the component of ROI.

At long last correlation done amongst current and database picture utilizing Euclidian Distance.This system recognise skin color so, it neglects to separate the hand area if other body part is in flat nearer to camera. The framework was touchy to red shading.

Hanning[3]in this paper they spoke to hand signal acknowledgment framework in view of nearby introduction histogram highlight conveyance show. Skin shading based division calculations were utilized to discover a cover for the hand district, where the info RGB picture changed over into HSI shading space. To smaller elements representation, k-implies grouping has been connected. This framework depended on static hand signal and tedious. Creators just named a generally little arrangement of preparing pictures

Nasser H. Dardas[4]in this paper creators spoke to continuous framework which including recognizing and following hand in messed foundation utilizing skin

location and form examination calculation after face identification and subtraction and acknowledgment utilizing guideline part investigation (PCA).Authors Experiments show that system could achieve satisfactory real time performance as well as classification accuracy above 90% under variable space, orientation, and cluttered background. Feature work was achieving more accuracy.

Saad[5]in this paper creator proposed the procedure for recognizing, comprehension and interpretation communication through signing motion to verbal dialect. There were two mode copy and interpretation mode. In this technique call this gesture "Recording Translation Gesture" or "RTG". This method contains four steps:

1. Receiving joint of interest 2. Control the skeleton frame data 3. Manufacture interface rundown of transitory stockpiling information

Recognizing motion Dynamic TimeWrapping(DTW) calculation is utilized to analyze signals. It is give 91% precision. It was not reasonable for finger development.

Parul Hardeep[6] in this paper authors provide method for identify sign language. It has three steps:

1. Pre-processing: To begin with info sign picture in RGB to change over into Labcolour space where L is lightness a and b are two colour channel. 2. Feature Extraction: It was done utilizing Area, tallness, Euclidance separate, Average stature. 3. Order: Feed forward back proliferation calculation was utilized for preparing and characterization.

Feed forward back spreadtraining algorithm was managed learning algorithm. In this input and output vector were provided for training network. It was provide 85% accuracy. It was not recognize dynamic gesture.

Mohanmmad I. Khan[7] in this paper authors proposed the HGR utilizing as a part of 3D environment utilizing profundity camera. Division it was utilizations YCrCb shading space for exact skin location.

It was utilize encoded nonlinear RGB. In the wake of identifying hand expel commotion from picture. For form location or discover limit area of identified hand then draw rectangular box around the shape and discover focal

point of hand. " Three components were adequately used to perceive the signal:

1. Introduction , 2. Zone of hand , 3. Edge of Box.

After discover region of hand, discover edge of box by utilizing draw box around hand form zone. Grouping was done utilizing Hidden Markov Model (HMM). Here likelihood of every class arrangement can be processed and most noteworthy likelihood was considered as yield. After that surveying strategy is utilized for arrange motion. So this proposed technique was giving 80.67% precision. It was not more dynamic.

AnanyaChodhury[8]in this paper creators spoke to preparatory stride of signal acknowledgment handle. Characterize hand division of signal in complex foundation. Here hand division was done utilizing RGB shading space changed over into HSI shading space. HSI is autonomous of luminance and reflectance. In shape coordinating use for containing pixel that were edge of protest is place on all conceivable position in the hunt picture and looking at match esteem for each position. Characterize biggest shape having biggest zone close by signal. For right signal characterize limit estimation of distinction. Comes about demonstrate the adequacy of the framework. Just concentrate on preparatory strides of motion acknowledgment and discovery of hand under complex foundation.

III. Methodology

A. K-Means Clustering[3]

The K-implies issue is to decide k focuses called focuses in order to minimize the grouping mistake, characterized as the entirety of the separations of all information focuses to their particular bunch focuses. K-Means bunching procedure is then rehashed until a ceasing condition is met. The halting condition may either be a most extreme number of cycles or a resistance edge which assigns the littlest conceivable separation to move group focuses before ceasing the iterative procedure. In this method prediction of K is difficult in fixed cluster.

B. Principal Component Analysis (PCA)[4]

PCA input frame capture frame, the detection then little picture that contains the identified hand motion is anticipated. PCA based methods normally contain two stages:

1. Training:- :- an eigenspaces is set up from the hand act preparing pictures utilizing PCA and the hand act preparing pictures are mapped to the eigenspaces for grouping.

2. Testing:-a hand motion test picture is anticipated to the eigenspaces and ordered by a proper classifier in view of Euclidean separation PCA lacks the detection ability.

C. Dynamic Time Warping (DTW)[5]

DTW has been utilized to locate the ideal arrangement of two signs. The DTW calculation figures the separation between every conceivable combine of focuses out of two signs and that flag is as characterized as their related component values. Utilizing these separations to ascertain a cummulative separation network and locate the slightest costly way through this grid and speak to perfect twist of synchronization of the two flags that causes the element remove between their synchronized focuses to be minimized.

D. Artificial Neural Network (ANN)[6]

An Artificial Neural Network is a data handling framework and has performance features in common with organic neural networks. It is produced as speculations of scientific models of human acknowledgment or neural science in view of the suppositions that At numerous straightforward components Information handling happens called neurons

1. Over association joins signs are passed among neurons.
2. Weight is connected with every association interface, which in a run of the mill neural net, increases the flag diffused
3. applies an initiation work (normally nonlinear) on every neuron to its net info (entirety of weighted information signals).

E. Hidden Markov Model (HMM)[7]

In telling hidden Markov Models it is suitable first to consider Markov chains. Markov chains are essentially limited state automata in which every state move circular segment has a related likelihood esteem; the likelihood estimations of the curves leaving a solitary state entirely to one. Markov chains force the confinement on the limited state robot that a state can have unique move circular segment with a given yield; a limitation that makes Markov chains deterministic. A concealed markov display (HMM) can be viewed as a speculation of a Markov chain without this Markov chain limitation. Gee is characterized as an arrangement of conditions of which one state is the underlying state, an arrangement of yield images, and an arrangement of state move.
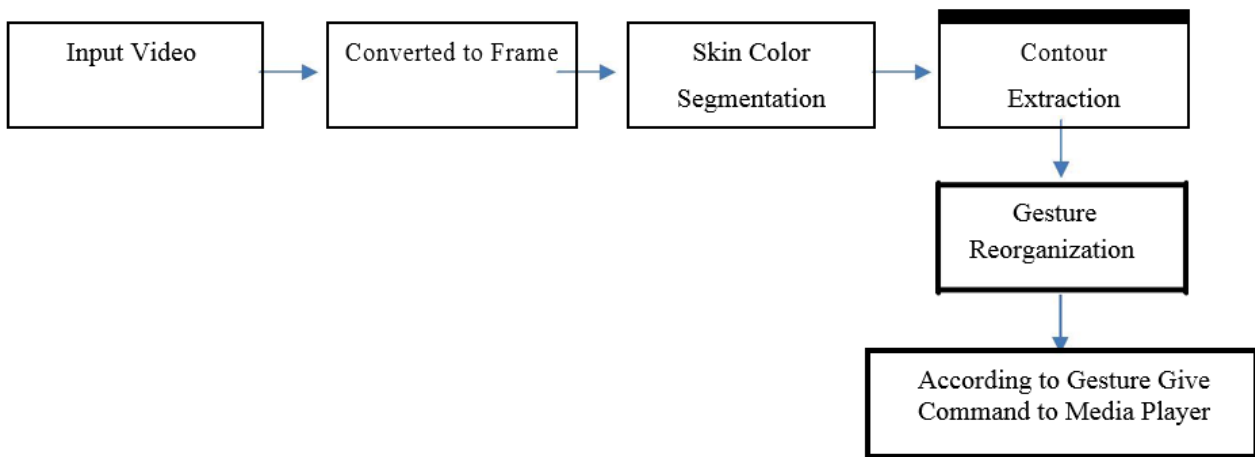
IV. PROPOSED SYSTEM FLOW

Figure 1 : Proposed System Flow

1. Input Video:

Select an appropriate video from a host machine playlist and open in hand gesture control media player. video can be in any format like mp4,avi,etc. otherwise you can record a real time video using the webcam and give them as a input to your player.

2. Converted to Frame

The selected video is converted into the frames to identify a particular gesture on two specific frame of the video.

3. Skin Color Segmentation

There are different types of techniques used in skin detection model for detection of hand region.Theyare:

✓ Approximate of background
✓ HIS(hue,saturation, intensity)
✓ YCbCr
✓ Morphology

4. Contour Extraction

Canny edge detector is used for detect the proper edges of gesture effectively and efficiently. Here proper procedure is follow to occupy the result.

In this module Classification Algorithms are use. Classification is an ordered set of related categories used to group data according to its similarities. It consists of codes and descriptors and allows survey responses to be put into meaningful categories in order to produce useful data.. In our Application we use Support Vector Machine (SVM) or Decision Tree Classifier Based upon Accuracy.

V. COMPARISON OF METHODS

Table 1: Comparison of methods

Reference paper	Segmentation	Classifier or Recognition	Recognition Rate or Accuracy	Pros	Cons
1	RGB, YCbCr and HSI	-	90%	HSI classical would greatly advantage in order to division the hand and fingers dissimilar hand shapes and sizes produce more accuracy	Database Require more memory
2	YIQ	Euclidian Distance	-		sensitive to red colour.
3	HIS	K-means cluster	86%	Produce tight Cluster	Time consuming, static hand.
4	HSV	PCA	90%	achieve satisfactory real time performance	Lack of detection ability
5	Depth Data	DTW	91%	Detect all gesture, good result	Uniform background
6	L*a*b	Neural Network	85%	Efficient and simple method	Less recognition Rate
7	YCbCr	HMM	80.67%	Easy to Understand	Long assumptions about data, Huge number of parameter need.
8	Combination of HSI and Frame differing	-	-	Working under complex back ground	Only detect hand.

VI. FUTURE WORK

In future work for this system proposed a combine model so it will detect the hand gesture effectively and efficiently which can be applicable to music player and we can also implement this system for online player like youtube or other websites.

Here our virtual media player implemented for windows based application so in future we can also implement our player for different operating system like ios, linux, Ubuntu, etc.

VII. CONCLUSION

Gesture recognition is very active area of research. The surrounding of the hand gesture itself dictates the degree of difficulty hand detection for dynamic hand gesture recognition.

In existing system skin segmentation using HSI. Only HSI not detect proper hand in dynamic hand gesture because of in dynamic hand gesture motion in hand not detect proper hand and noises also create.

In Proposed dynamic hand gesture recognition, combination of HSI, YCbCr and morphology for skin segmentation, Euclidian distance methods is proposed for feature extraction provide to SVM for classification. SVM provides classification with good recognition rate static hand gesture as well as same and better recognition rate in dynamic hand gesture.

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