



AN EFFICIENT HAND GESTURE CONTROL OF MEDIA PLAYER USING SVM AND YCbCr

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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.

Keyword: 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, 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 instruments. Utilizing the idea of movement acknowledgment, it is possible to point a finger at the PC screen so that the cursor will move suitably. This could conceivably make routine information machines, for example, mouse, Keyboards and even touch screens excess. Signal acknowledgment can be directed with systems from PC vision and picture handling.

II. METHODOLOGY

2.1 K-Means Clustering^[3]

The K-means 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. The calculation begins by haphazardly finding k groups in ghostly space. 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.

2.2 Principal Component Analysis (PCA)^[4]

PCA input frame capture frame, the detection then little picture that contain the identified hand motion are anticipated. PCA based approaches normally contain two parts:

1. **Training:-** an Eigen spaces is set up from the hand act preparing pictures utilizing PCA and the hand act preparing pictures are mapped to the Eigen spaces for grouping.
2. **Testing:-** a hand motion test picture is anticipated to the Eigen spaces and ordered by a proper classifier in view of Euclidean separation PCA lacks the detection ability.

2.3 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 cumulative separation network and locate the slightest costly way through

this grid and speak to perfect twist of synchronization of the two banners that causes the component evacuate between their synchronized concentrations to be limited. This technique is done after the signs are institutionalized and smoothed. DTW is useful in various applications, for example, discourse acknowledgment, information mining and development acknowledgment.

2.4 Artificial Neural Network (ANN)^[6]

An Artificial Neural Network is a data handling framework and has performance characteristics in mutual with fundamental neural networks. It is produced as speculations of scientific models of human acknowledgment or neural science in view of the suppositions that

1. At numerous straightforward components Information handling happens called neurons.
2. Over association joins signs are passed between neurons.
3. Weight is connected with every association interface, which in a run of the mill audible net, increases the flag transmitted
4. applies an initiation work (normally nonlinear) on every neuron to its net info (entirety of weighted information signals).

2.5 Hidden Markov Model (HMM)^[7]

In describing hidden Markov Models it is appropriate first to take up Markov chains. Markov chains are essentially limited state machine in which every state move circular segment has a related likelihood esteem; the likelihood estimations of the curves leaving a solitary state entirety to one. Markov chains force the confinement on the limited state robot that a state can have one and only 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.

III. PROPOSED SYSTEM FLOW

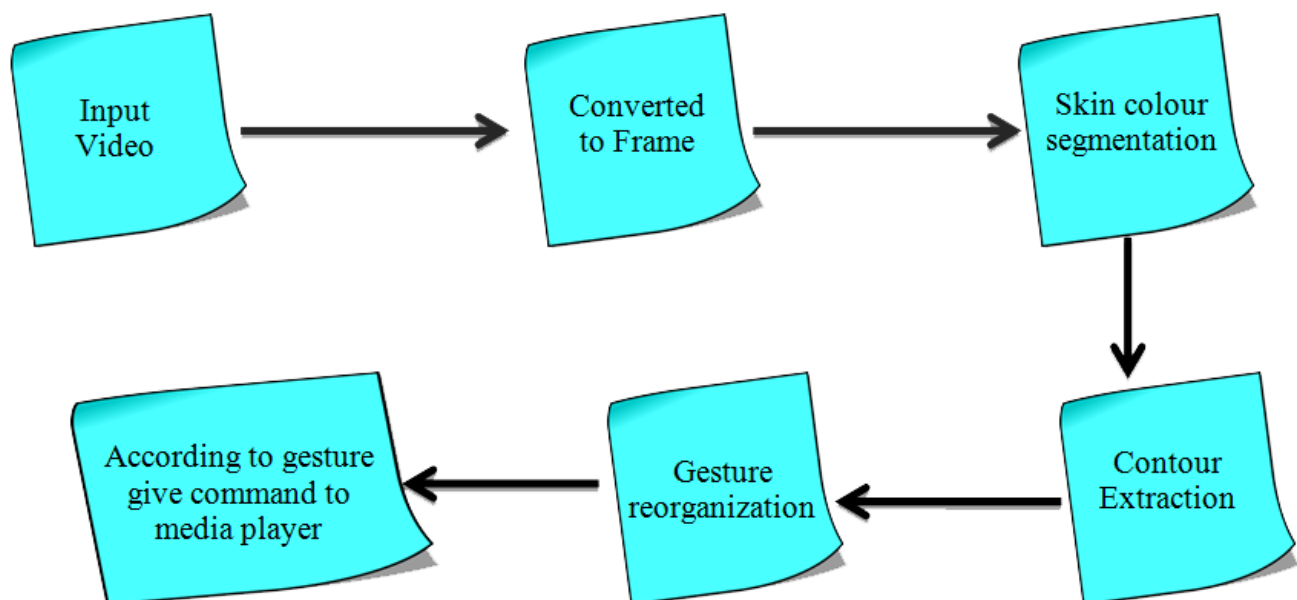


Figure 1. Proposed system flow

Description:

In our Proposed System first we give input to our player by browsing file directory from the system then video is converted into frames after that we have use YCBCR Model for Skin color segmentation and for classification of gesture here SVM is used with HOG feature. After detect the gesture, according to gesture give command to media player to operate.

Scope of system:

- Avoid the use of physical device indirectly.
- Increase the volume by particular hand gesture.
- Decrease the volume by particular hand gesture.
- Play the video in defined manner using particular hand gesture.
- Pause the video in defined manner using particular hand gesture.
- Play next video using specific hand gesture.
- Play previous video using specific hand gesture.
- In future ,use this method in many other devices like Television ,Air Conditioner ,Music Player etc.

IV. IMPLEMENTATION RESULTS

From the below figure , we conclude that when thumbs up gesture is applied to our hand gesture control media player , and video or audio is selected from the file via browse feature and it is played , so our system working properly.

Table 1. Video Capture Configuration

Video	RGB
Frame rate	30
Distance	2-5m
Resolution	640X480
Process time	0.22sec

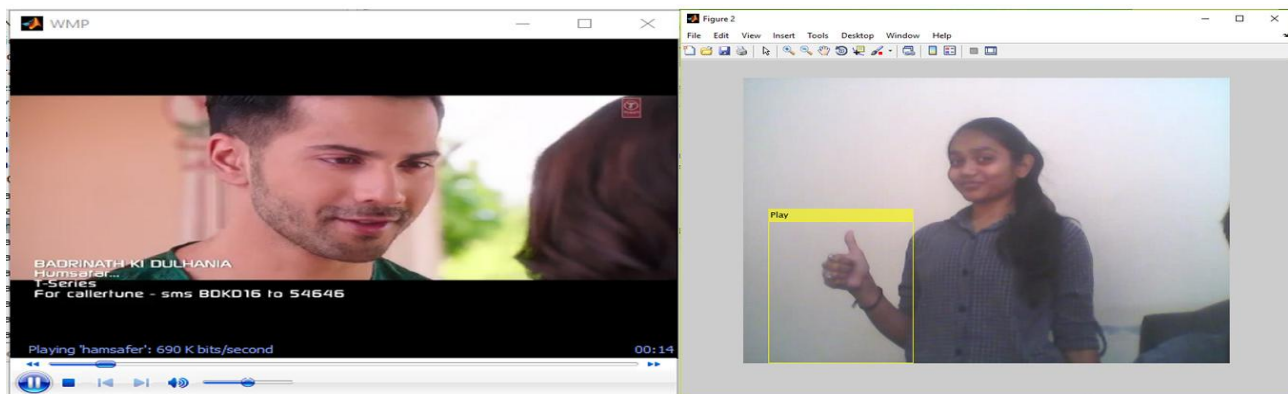


Figure 2. Result of play

From the below figure , we conclude that when palm gesture is given to the hand gesture control media player , and currently playing video or audio is paused.

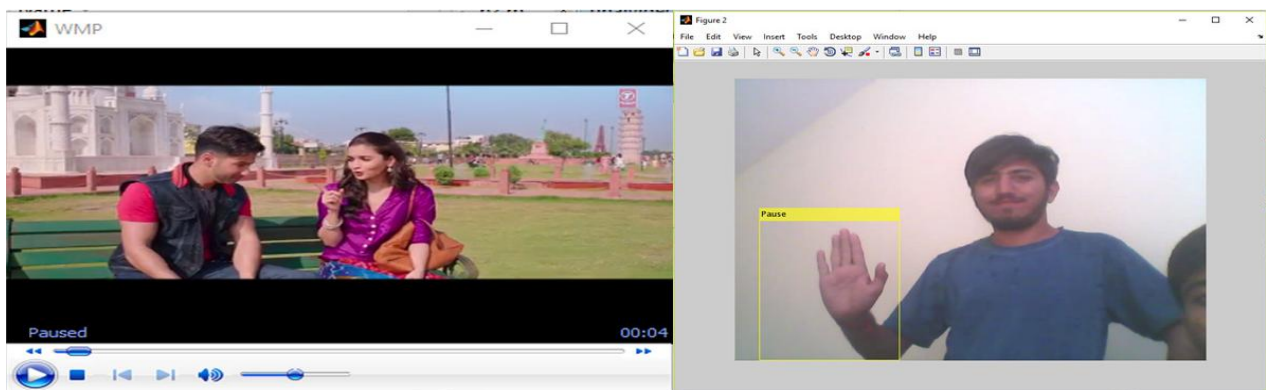


Figure 3. Result of pause

As shown below figure , we developed Graphical User Interface(GUI) for hand gesture control media player , using this interface end users can browse audio or video from system , in second we can apply gesture and that is shown to end users.

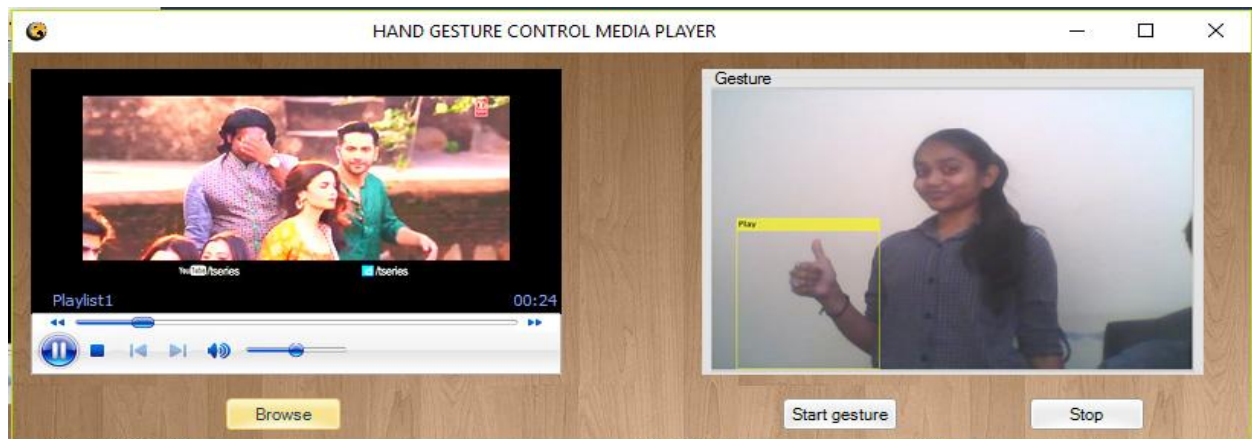


Figure 4. GUI design

V. COMPARISON OF METHODS

Table 2. Accuracy Table for Recognition

Detection	YCBCR	HSI	Combine
Accuracy (%)	82.45	82.33	90.24

Table 3. Accuracy Table for Detection

Recognition	ANN+HOG[6]	SVM+HOG
Accuracy (%)	93.22	98.89

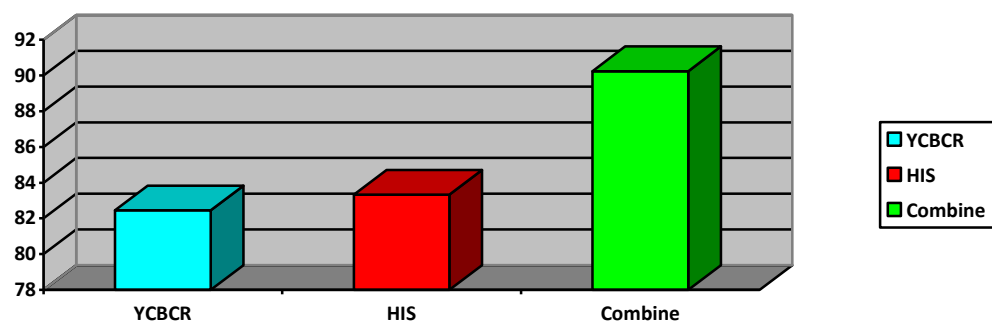


Figure 5. Accuracy Graph for Recognition

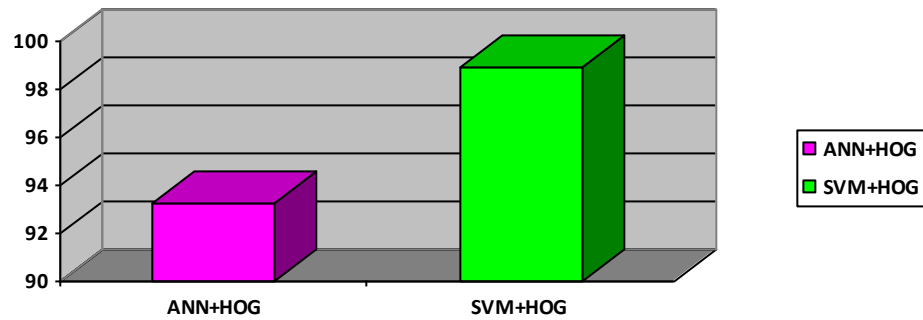


Figure 6. Accuracy Graph for Detection

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 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. The proposed system is 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.

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