

Media Player Control Using Augmented Reality

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Abstract : In the recent technological advancement many devices have been automated for the ease of their utilization, due to which there has been tremendous demand in HCI Applications. In the HCI field most of the focus is on the interfacing techniques which involve Human and Computer interaction. Several HCI techniques so far has been evolved such as color pointer , data glove, sensor based . etc. In the proposed paper our focus is on one such technique called Augmented Reality. Augmented Reality is one step ahead when it comes to handling computer applications. Augmented Reality is based on 3D motion tracking of human movements. It is more robust and has its applications in upcoming Gaming consoles, handling computer applications and its future scope in e-commerce systems. In this Paper we are going to Implement this Augmented Reality concept to control the Media Player.

Keywords: Augmented Reality, HCI (Human Computer Interaction).

I. Introduction

In the past 5-10 years there has been rapid growth in the technology of HCI. Many users want to ease their work by using wireless or which doesn't require their deep involvement in handling the computer applications. For such users HCI fulfills their requirement by letting them to interact with computer without using keyboards, mouse, joysticks etc. Its not only applicable to general community but also those disabled persons who finds it difficult to operate the computer applications or any other devices. Especially those techno freak people who are always updated with their devices with the technological advancements. Augmented Reality is a technology which changes the real world objects into virtual reality. Augmented Reality (AR), an upcoming Human-Computer Interaction technology, that aims to combine the computer generated 2D or 3D virtual objects with real world pictures Gestures is a major source of commands that is interpreted in the Augmented Reality. Gestures may involve hands, legs, eyes, head but the most common being the hands. Augmented Reality has no restrictions on the background when dealing with the live feed through cameras.

II. Proposed System

In the Proposed System, we are going to control the media player using Augmented Reality. As we all know when dealing with the media player, we require to perform many operations such as play, pause , stop , next, previous, and sometimes it gets tiresome when we are doing multiple tasks at a same time on our machine. To eliminate the use of keyboard and mouse we need some alternative that can ease our work and hence Augmented Media Player comes into picture. In the Proposed system we are going to display a Virtual Menu that is associated with a particular media player on the live captured feed for dealing with the several media player operations.

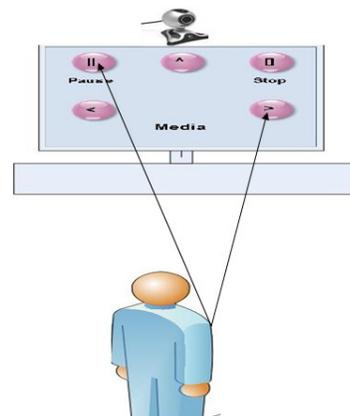


Figure.1 Augmented Media player

Through the Webcam we are setting the base image of our hand, then we apply some image processing algorithms to recognize our hand movements and finally we can directly point towards the button icon on screen for particular operation to be performed.

The steps involved in this system are as follows:

1. Camera interfacing
2. Frame Grabbing
3. Blur the input image
4. RGB TO HSV
5. Background image registration
6. Current frame subtraction
7. Thresholding
8. Blob detection
9. Augmented Reality buttons/Gesture Estimation
10. Postprocessing

III. Gesture Recognition

As we are dealing with our hands we need a very strong color model, so we are going to use HSV color model that is very strong enough to recognize the natural color of our body. For recognizing our hands the following algorithms are applied:

1. Blurring (color):

Web camera grab an images of user Gestures. We need to blur the images to reduce noise in the image by splitting all RGB value separately and Calculate the RGB average of surrounding pixels and assign this average value to it. We Repeat this above step for each pixel and finally we get blurred images of Hand Gestures.

2. RGB TO HSV

As we get the RGB image we need to convert this image into HSV, as we are using HSV color model to detect the natural colors of our hands. In HSV model value of H and S remain constant if the value of V changes, but value of RGB changes with the change in V. So we get True color value.

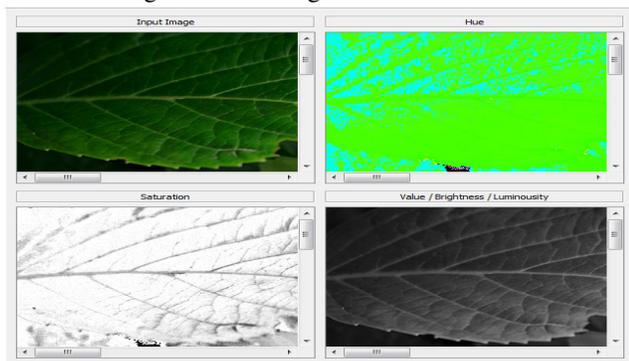


Figure.2 HSV Image

3. Thresholding:

After getting the HSV image we perform the HSV thresholding to separate the foreground image and background image i.e into black and white. In this method we randomly select one pixel to set it as a threshold value. Any pixel values above or below this threshold is set to black or white as per the algorithm.



Figure.3 Thresholding

4. Blob Detection:

Blob detection is done to detect the objects that we require for performing operations. i.e only certain part of the hands. For detecting blob firstly, Starts from the first line of the image and find groups of one or more white (or black) pixels. Group of one or more white pixels are called as lineblobs. Find X, Y co-ordinates of each those blob .Number each of these groups. Repeat this sequence on next line. While you are collecting the lineblobs, check whether the lineblobs that checked before this current line and see if these blobs overlap each other. If so, you merge these lineblobs by using there X and Y co-ordinates to one blob it will treat as a whole blob. Repeat this for every line and you have a collection of blobs.

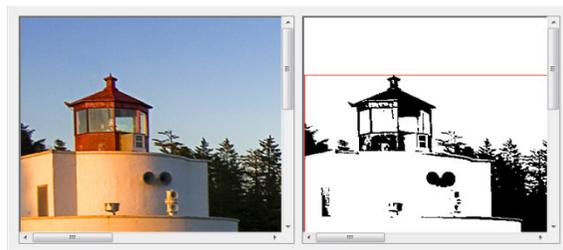


Figure.4 Blob Detection

III. Media player Control

Every media Player that we use in our pc has some keystrokes associated with it. In Augmented Reality we present this keystrokes on virtual screen to let user control media player functions. User interface is created by generating this keystrokes on the screen such that user can directly view himself in front of the augmented view. For

doing so user has to first run the media player that he wants to control and it has to be in active mode. User can start the application and can point his hands towards the camera and accordingly move his hand towards the button/action to select it.

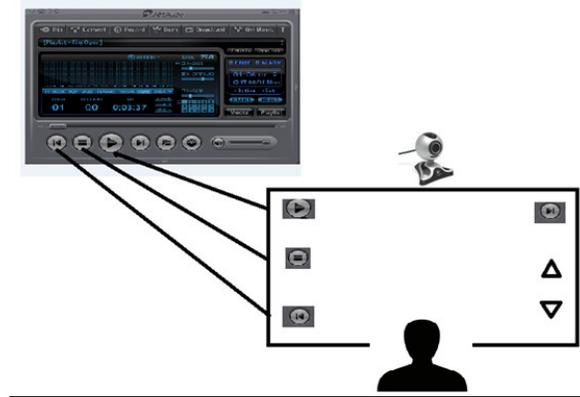


Figure.5. Media Player Control

IV. Conclusion and Future Work

This paper exposes a system that is based on Augmented Reality in which users can directly control the media player operations just by using their hand in front of the camera (Augmented Media player). Not only hands but user can even point to it by any other object like pen, stick etc. Augmented Reality concept can further be implemented to control various other devices in the future. It certainly has potential to give a user friendly environment for Human Computer Interaction. Future scope for it will be controlling electronic devices like washing machine, ceiling fan etc. It also has huge demand in the e-commerce system. It can be implemented in online shopping where user can browse the items, select, add to cart, delete an item using the Augmented view of the Shop. Augmented Reality surely does have a bright Future. In future this can be a better option for advertisement purpose in Malls, Multiplexes.

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