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A Computer Vision based V-Dressing room application using web camera

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ABSTRACT - The unwanted occlusions between the user and the model. Radio frequency identify The search for the safe and secure online shopping leads to the development of virtual environment for clothes try on. This study proposes a real time virtual dressing room application to enable users to try virtual garments in front of a virtual mirror. The client's hand movements select the garments from a run down on the screen. A while later, the chose virtual garments show up on the client in the virtual mirror (web camera). For the purpose of aligning the 3D garments with the model, 3D locations of the joints are used for positioning, scaling and rotating. The skin color detection algorithms are also used to handle cation (RFID) is used as electronic prepaid card, to pay the price of the dress.

Keywords— Radio frequency identification (RFID),Computer Vision, OpenCV, Augmented Reality, Human-Computer interaction.

I. INTRODUCTION

OpenCV was intended for computational productivity and with a solid spotlight on constant applications. Written in upgraded C/C++, the library can exploit multi center handling. One of OpenCV's objectives is to give an easy to-utilize PC vision foundation that enables individuals to manufacture genuinely complex vision applications rapidly. OpenCV is aimed at providing the basic tools needed to solve computer vision problems.

In this paper a virtual dressing room application using OpenCV is introduced. Trying clothes in clothing stores is usually a time consuming activity. Besides, it might not even be possible to try-on clothes in such cases as online shopping. By creating a virtual dressing room environment we can increase the time Efficiency and improve the accessibility of clothes try on in dressing room. The problem is simply the alignment of the user and the cloth models with accurate position, scale, Rotation and ordering. First of all, detection of the user and the body parts is one of the main steps of the problem. In literature, several approaches are proposed for body part detection, skeletal tracking and posture estimation. Extraction of user allows us to create an augmented reality environment by isolating the user area from the video stream and superimposing it onto a virtual environment in the user interface.

Radio frequency identification (RFID) is utilized to portray a framework that transmits the character (as a special serial number) of a protest or individual remotely, utilizing radio waves. It's grouped under the broad category of automatic identification technologies. RFID is used as prepaid electronic card and the price of the dress can be paid from the card.

II. DESIGN METHODOLOGY

The ultimate aim of this paper is to increase the time efficiency and improve the

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accessibility of clothes try on by creating a virtual dressing room environment. In the existing system, trying clothes involve superimposition of clothes on the photo frame of the person. This may not satisfy the customer completely. Because sometimes the clothes chosen by them may not be fit to them.

The proposed approach is mainly based on extraction of the user from the video stream, alignment of models and skin color detection. The 3D locations of the joints are used for positioning, scaling and rotation in order to align the 2D cloth models with the user.

In this approach the Viola Jones algorithm, a widely used method for real-time object detection for face detection is used. Training is slow, but detection is very fast, segmentation is done by using Graph Cut algorithm and fitting, scaling, and translation are done by using Morphological algorithm. The user interface allows the user to choose a t-shirt by making a hand movement towards to it.

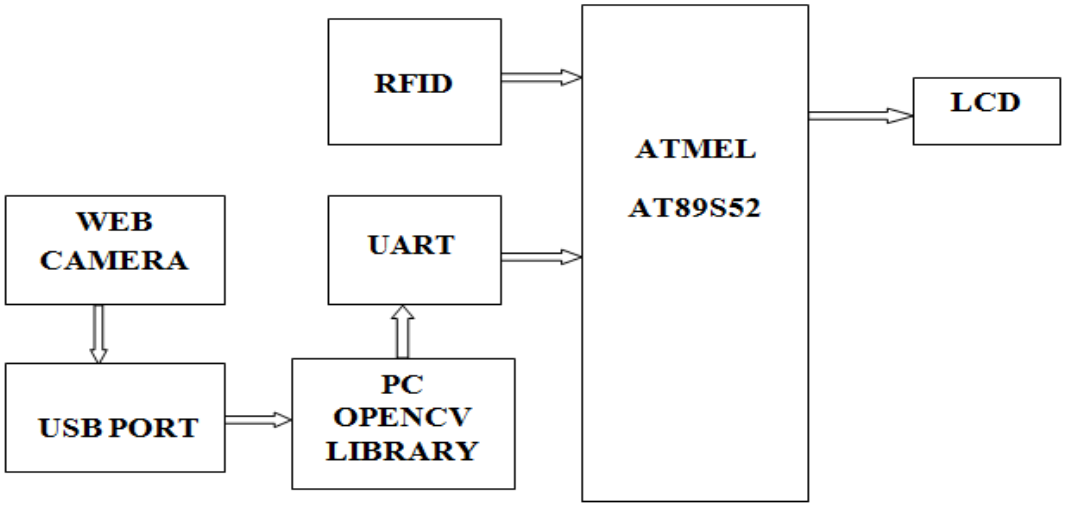

Figure 1 Block diagram of the proposed system

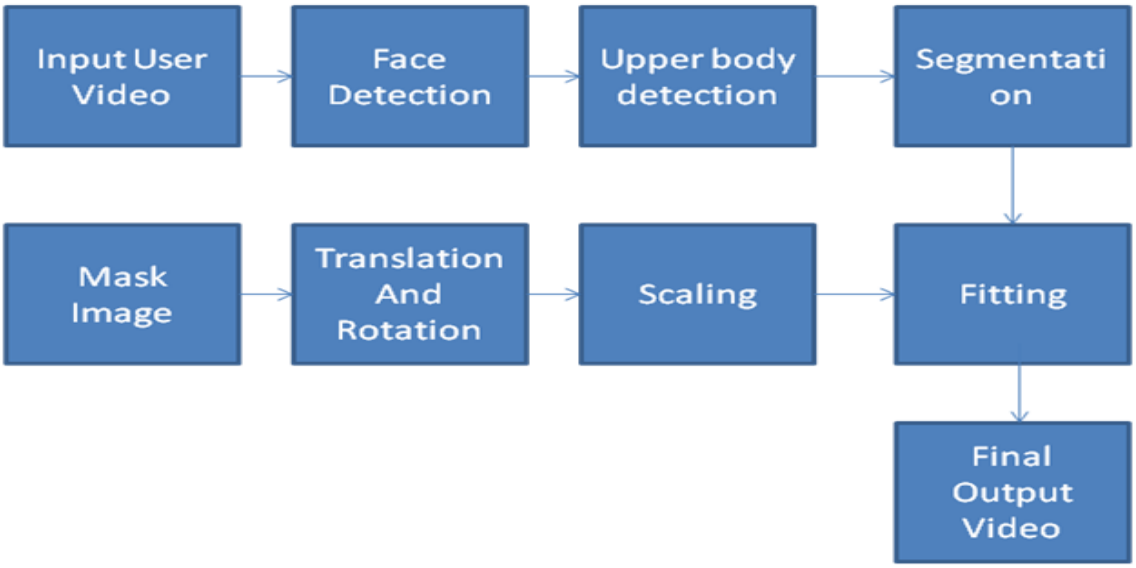

Figure 2 Design Methodology

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The Block diagram of the proposed system is shown in figure 1. Figure 2 depicts the steps involved in design methodology. The input video is captured using web camera and is given to PC through USB port.

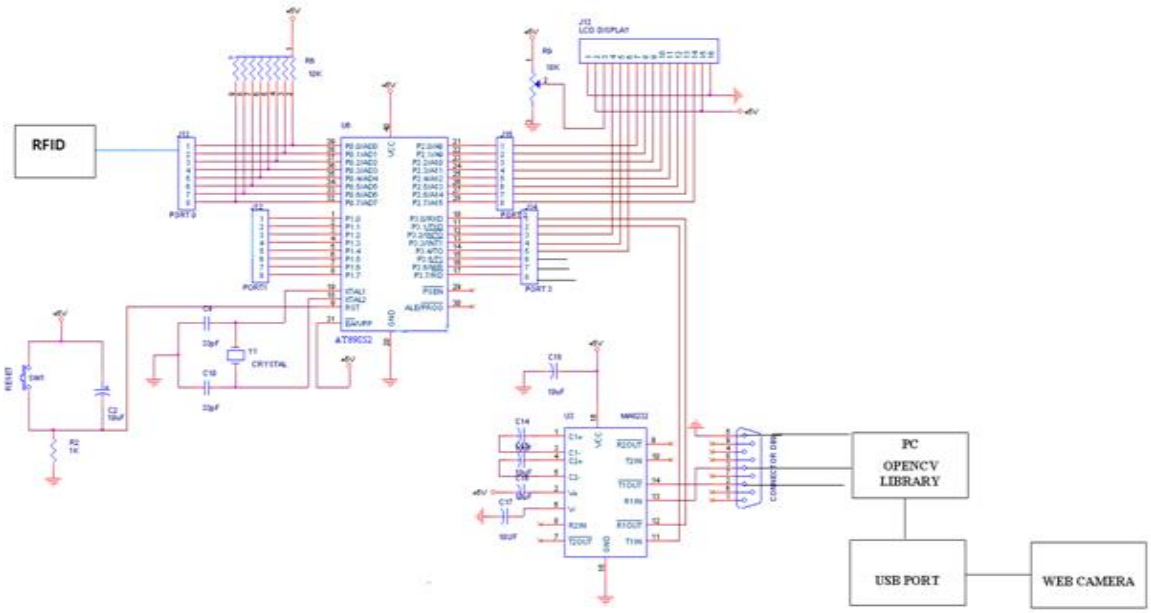

Figure 3 Schematic block diagram

The PC has been pre-installed with openCV library. This carry out specific task like face detection, The process of 'fitting' is carried out between the captured video and the mask image using criteria like Translation, Rotation and Scaling after the dress has been selected. In this approach, the Voila Jones algorithm for face detection. Segmentation is done by using Graph cut algorithm and Fitting, Scaling and Translation are done by using Morphological algorithm.

The PC is connected to the microcontroller through UART which is for making serial communication between the PC and the controller. The information about the selected dress is given to the controller from the PC through this UART. From the controller the rate of the selected dress is given to the LCD to display.

The Bar code information of the selected dress is given to the third port of ATMEL89s52 through UART. Thus the controller displays the rate of the dress in LCD through port2. The RFID is connected at port0 of the microcontroller. This contains Reader and Tag using which the customer can pay the displayed amount.

The maximum voltage that can be applied to the controller is 0v (VSS) to 5v (VDD). The input supply given to RFID is 5v to energies the coil and to generate electromagnetic field.

ALGORITHM

Step1: Start
Step2: Face & body detection- using VIOLA JONES algorithm. This algorithm is implemented in OpenCV as cvHaarDetectObjects()
Step3: Segmentation

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Step4: Fitting using Translation, rotation and scaling
Step5: Morphologic operations (Dilation & Erosion)
Step6:Final Output video
Step7:Dress barcode information given to microcontroller through UART
Step8:The cost is displayed in LCD
Step9:The cost is paid using RFID
Step10:stop

III. RESULT AND DISCUSSIONS

The proposed system requires only to have a front image for each product to superimpose it onto the user and the 2D graphics of the product seem to be relatively satisfactory and practical for many uses.

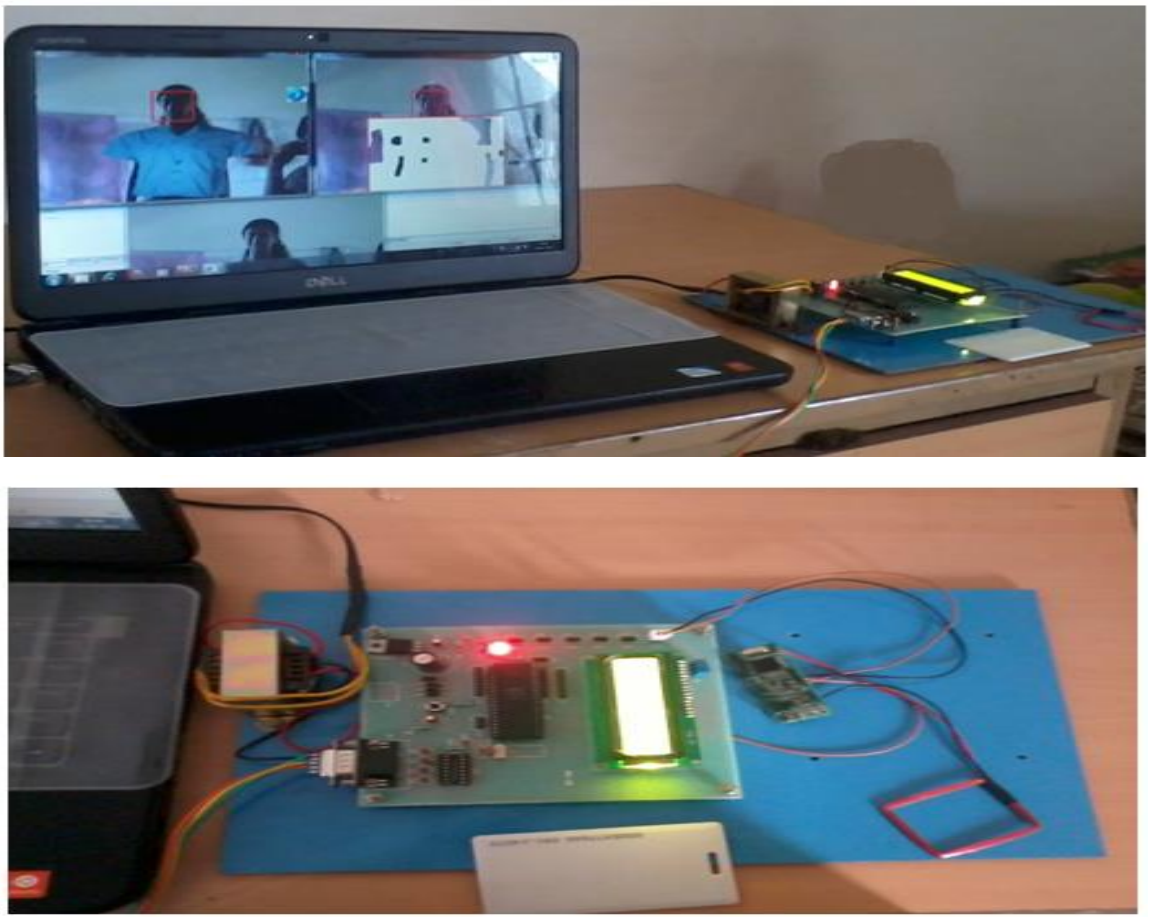

Figure 4 Experimental model

The experiments have resulted with acceptable performance rates for regular postures. Figure 4 shows the experimental results where the dress is superimposed on the user.

There are many possible implementations regarding the model used for fitting. It is possible to apply a homographic transformation to the images rather than the simple scale-rotate

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technique in order to match multiple joints altogether although it would require more computation. Another alternative could be using many pictures at different angles so that it would be possible to create more realistic video streams. One could achieve a similar effect using 3D models and rendering them according to the current angle and positions.

Application

- Benefits to customer
- Better opportunities for creative expression/ experiment for clothing style
- Reduce the proportion of returned items
- Increased opportunities for customization.

IV. CONCLUSION

To improve comfortable online shopping this paper proposes a methodology by which the user can select their dress online and it is imposed on them so that, they can have happy shopping. The proposed system uses various efficient algorithm to extract user from the video stream. It also supports online payment through RFID.

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