Advanced Computer Vision based Virtual Dressing Room

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***Abstract*—**A virtual dressing room is the online equivalent of an in-store changing room. It enables shoppers to try on clothes to check one or more of size, fit or style, but virtually rather than physically. Because of the privacy afforded by changing rooms, they create a problem in the tradeoff between security and privacy, where in it may be possible for crime to be perpetrated by people using the cover of privacy. Some department stores have security cameras in the changing rooms which make people to get scare of entering to it and they don't prefer for having a trial. So here we opt for a virtual dressing room concept in which trial room section is not needed. We can shop terminal that integrates image matching, interactive sharing, shopping and making online payment by Open CV library. Open CV (computer vision) is the leading open source library for computer vision, image processing and machine learning.

***Keywords*—**Dress Changing Rooms; Department Stores; Image Matching; Trial Room; Virtual Dressing Room.

***Abbreviations*—**Computer Vision (CV); Integrated Performance Primitives (IPP); Machine Learning Library (MLL).

I. INTRODUCTION

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. Our motivation here is to increase the time efficiency and improve the accessibility of clothes try on by creating a virtual dressing room environment. 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. The problems can be brilliantly managed by means of simple software like OpenCV. Extraction of user image in order to create an augmented reality environment by isolating the user area from the web camera and superimposing it onto a virtual environment in the user interface. Thus the user can see a virtual image of themselves in the costume of their preference and interact with the virtual mirror. The usage of web camera makes it easier on the cost for the users of online shopping. The implementation by OpenCV makes it more platform independent and portable and there by accessible in any form of device. After the trial room section the user goes for the payment section which contains RFID and SMARTCARD, UART, Microcontroller and LCD.

1.1. OpenCV

OpenCV is an open source computer vision library available from http://SourceForge.net/projects/opencvlibrary. The library is written in C and C++ and runs under Linux, Windows and Mac OS X. There is active development on interfaces for Python, Ruby, Matlab, and other languages.

OpenCV was designed for computational efficiency and with a strong focus on real time applications. OpenCV is written in optimized C and can take advantage of multicore processors. If you desire further automatic optimization on Intel architectures, you can buy Intel's Integrated Performance Primitives (IPP) libraries, which consist of low-

level optimized routines in many different algorithmic areas. OpenCV automatically uses the appropriate IPP library at runtime if that library is installed.

One of OpenCV's goals is to provide a simple-to-use computer vision infrastructure that helps people build fairly sophisticated vision applications quickly. The OpenCV library contains over 500 functions that span many areas in vision, including factory product inspection, medical imaging, security, user interface, camera calibration, stereo vision, and robotics. Because computer vision and machine learning often go hand-in hand, OpenCV also contains a full, general-purpose Machine Learning Library (MLL). This sub library is focused on statistical pattern recognition and clustering. The MLL is highly useful for the vision tasks that are at the core of OpenCV's mission, but it is general enough to be used for any machine learning problem.

The rest of the paper is organized as follows. In Section II we review several existing virtual dressing technologies. Then our Advanced computer vision based virtual dressing room method is proposed in Section III. In Section VI we describe the block diagram, while the conclusions are drawn in Section V finally.

II. EXISTING VIRTUAL DRESSING TECHNOLOGIES

In real life, since different garments have different structures, such as T-shirts, coat, trousers, skirts, etc., their corresponding dressing ways are also different. On the other hand, in the virtual world of computer simulation, how to wear these different kinds of clothes for mannequins more easily and efficiently?

In the Existing system, the trail rooms, people especially cannot identify the cameras which are hidden. This actually gives rise to lots of crimes and many people fall victims to these crimes. It is practically impossible to detect the cameras by the normal crowd. Generally some girls will also make a test placing the tip of their fingernail against the reflective surface and if there is a gap between your fingernail and the image of the nail, then it is a genuine mirror. However, if their fingernail directly touches the image of their nail, then they will be bewaring of that. (There may be someone seeing you from the other side). The reason there is a gap on a real mirror, is because the silver is on the back of the mirror UNDER the glass. Whereas with a two-way mirror, the silver is on the surface. Some people are not aware of that and they can't find out. Another testing method used is placing a call to and then wave the device around a suspected item.

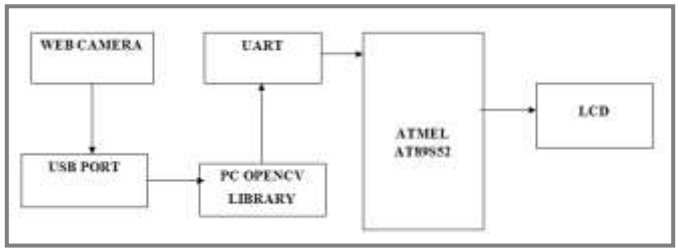

Figure 1: Block Diagram of the existing system

The above block diagram in the existing system, which contains only trial room section where the user cannot pay through online. So, that the existing system is improved by the use of RFID and SMARTCARD in which the user pay through online. And these existing systems available only in showrooms in form of virtual mirrors also known as virtual dressing room.

III. PROPOSED SYSTEM

The proposed project defines the augmented reality mirror-image which is shown back to the user on a large display. This will give the user the impression that he or she actually wears the garment shown on the screen. One use case of this project is in fashion stores where a potential customer picks some clothes he or she wants to wear, but unfortunately they do not come in the desired size or color. With the virtual dressing room this situation is no longer a problem as the customer simply steps in front of the intelligent mirror and instantly sees how the garments look on his or her body. For high quality body measurement here we propose a body tracking algorithm which results the image in black and white segmentation by using perimeter analysis property. Finally the payment is also done through online which results in time consumption.

3.1. Block Diagram

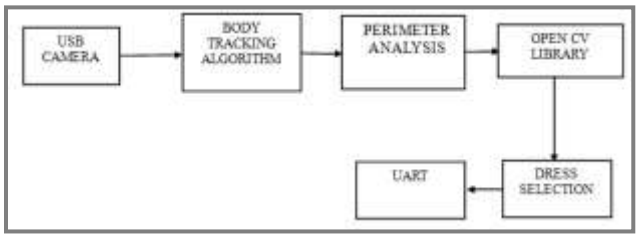

Figure 2: Trail Room Section

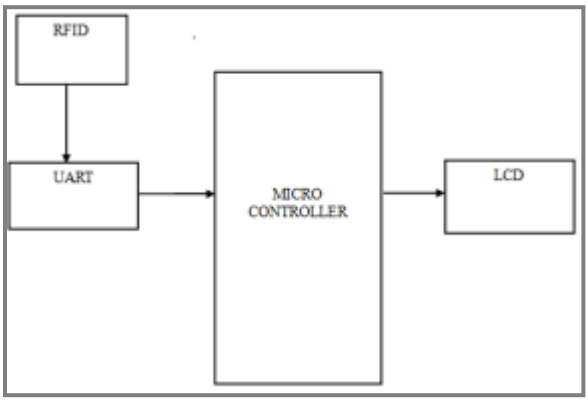

Figure 3: Payment Section

IV. IMPLEMENTATION

The image of the user is captured by the camera and inputted to the software module. By using the Face detection and Body detection techniques the video is scanned for the presence of human faces. Body tracking and perimeter analysis are done and these images are then masked. The

unwanted details in the video stream are removed. Segmentation and Fitting take place by the background subtraction algorithm. Now, the masked image is superimposed and the user can see the images of the dresses on self and then choose to buy the product and then pay through online.

V. CONCLUSION

This paper analyzes the advantages and disadvantages of various existing dressing methods, and proposes a new way of virtual dressing. The best advantage of our method is the dressing process takes only a few assumptions and manual intervention for various styles of clothes, making it is possible for dressing in virtual dressing room for clothes ecommerce applications and paid through online. This can be accessed from anywhere.

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