

# An Image Based Virtual Fitting Room for Online Shopping

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**Abstract** -In modern years there has been a more usage of internet in all the categories. The quantity of people using the internet for shopping increases due to development in information technology. The biggest problem for shoppers in online fashion is that they don't know how exactly the clothes and accessories look on them. The purchase of products like apparels which always needs an experience of expertise that how cloths would fit the shape of a person. When this comes to decreasing the quantity purchased is comparatively less in online shopping. Virtual fitting room helps the people to make out how the cloths personally fits to them. It would be a great comfort for the online shoppers to give a wide selection for consumers. For customers, online shopping would give more information and availability of all varieties of products especially apparels. This makes every product to come to the doorstep and gives consumers the choice of taste and purchase. Virtual dressing room is very useful to customers and they have many choices for selection of apparels.

**Keywords**—Online Shopping, Human Contour, Histogram Equalization, Virtual Fitting.

## 1. INTRODUCTION

In most recent years, there has been a gorgeous extend in pastime in the direction of online shopping. Due to technological development, the amount of people using the internet for shopping increases day by day. For customers online shopping would give more information about the products[5][8]. The purchase of dresses leads to a query whether it fits to the body shape of a person. When this comes, which leads to decreasing the quantity purchased is comparatively less. This is because people don't know whether the clothes fits them or not. This can be fulfilled by virtual fitting room had a wide choice for consumers. This also helpful for producers. Virtual dressing room plays an important role in online shopping to check whether the clothes match together and size of the clothes will fits them or not[10].

## 2. LITERATURE REVIEW

Peng Guan *et.al.*,(2015) [1] proposed a Clothing Detection, division and posture estimation, Tracking of individuals in monocular pictures are generally examined. Two-dimensional models are generally used

to represent the human body outline. They depict another 2D model of the human body form that consolidates a basic exposed body with a low dimensional garments display. Dress is spoken to as a twisting from the hidden body form. The strategy is assessed quantitatively on engineered and genuine pictures and accomplishes preferred exactness over past techniques for evaluating body shape under apparel.

D. Anguelov *et.al.*, (2005) [2] proposed the DCP show is utilized for location, following, and so on. The fundamental thought is to isolate the displaying of the first body from its dressed appearance. By expressly demonstrating attire they deduce the probably bare body shape from pictures of dressed individuals. They additionally settle for the posture of the hidden body, which is valuable for applications in human movement understanding. The educated model precisely catches the shapes of dressed individuals making it more suitable for following and division. At long last, the model backings new applications, for example, the acknowledgment of various kinds of garments from pictures of dressed individuals. There are a few novel properties of the DCP show. First they characterize

Eigen attire to display misshapening from a fundamental 2D body shape. Given preparing tests of dressed body forms, where the stripped state of the individual is known, they adjust the bare shape to the apparel form to figure the distortion. The Eigen-apparel demonstrate is mastered utilizing PCA connected to these distortions. A given CP demonstrate is then "dressed" by characterizing an arrangement of straight coefficients that create a twisting from the exposed shape. Specifically, they demonstrate that the Eigen coefficients depicting apparel distortions are not Gaussian and they show them utilizing Beta appropriations that catch their unbalanced nature.

S. Bianco *et.al.*, (2012) [4] proposed a Clothing descriptors of anatomical kinds are more differed and less logical, e.g. "outsize", "level chested" or, "pear-molded". Data to date on body shapes is to a great extent episodic and most dress is made to fit few stands, which are wanted to speak to "normal" sizes. The defense is notable custom and practice, with little consistency in the commercial center and proceeding with client worries about fit. Shape examination permits the right averaging of body shapes which fall into a specific size classification, empowering enhanced mannequins (genuine and virtual) to be made. Form coordination is one of the self-articulations which have been dependably in requests. Hunting down flawless clothing, is a tedious assignment and in addition numerous elements should be remembered. In this paper they are presenting a "Virtual Fitting Room". This is a creative Virtual shopping foundation, empowering clients to picture themselves wearing pieces of clothing present in conventional stores, and additionally on the web (in web shops). This is finished by mining of the client picture, arrangement of models and skin shading discovery of picture (clicked from a fix distance).The significant repayment of the VFR incorporate, sparing time of the client/client by staying away from wear and doffing at the season of shopping, where both the virtual and physical universes are joined. This application will have the capacity to fill a major hole among client and vender by demonstrating garments of shifting size. At long last the model is superimposed on the client progressively with some manual change.

### 3. PROPOSED ALGORITHM

Now, consider the correlation between body and clothes. The diversity of body shapes greatly influences the appearance of clothes. The waist width and the hem length, differs depending upon the body shape, even though the users adopt the same pose. Thus, we focus on the relationship between body shape and appearance of clothes for the virtual fitting system. Fig.1 shows the block diagram for virtual fitting room. Colour plays an important role in better understanding of natural scenes by at least facilitating for boundary detection in complex based on the opponent mechanisms of the visual system. The red-green and blue-yellow colour opponent channels in the human visual system are regarded as the building blocks for various colour perception tasks such as boundary detection. The framework is a feed forward hierarchical model, which has direct counterpart to the colour-opponent mechanisms involved in from the primary colour to improve the quality for detecting the boundary.

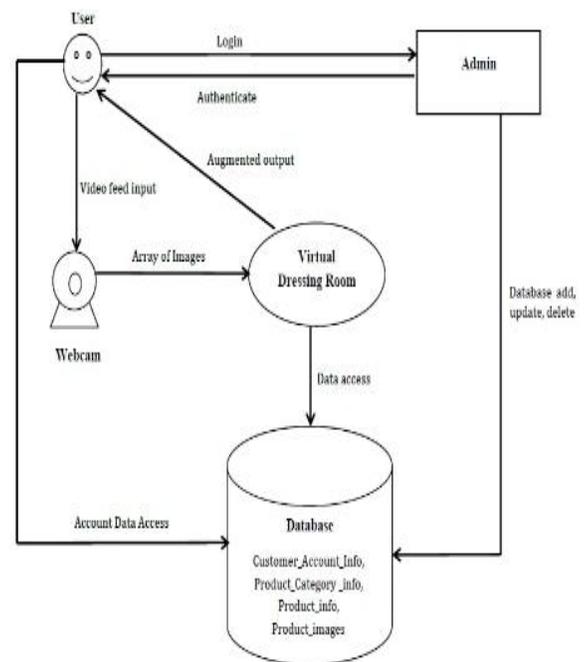
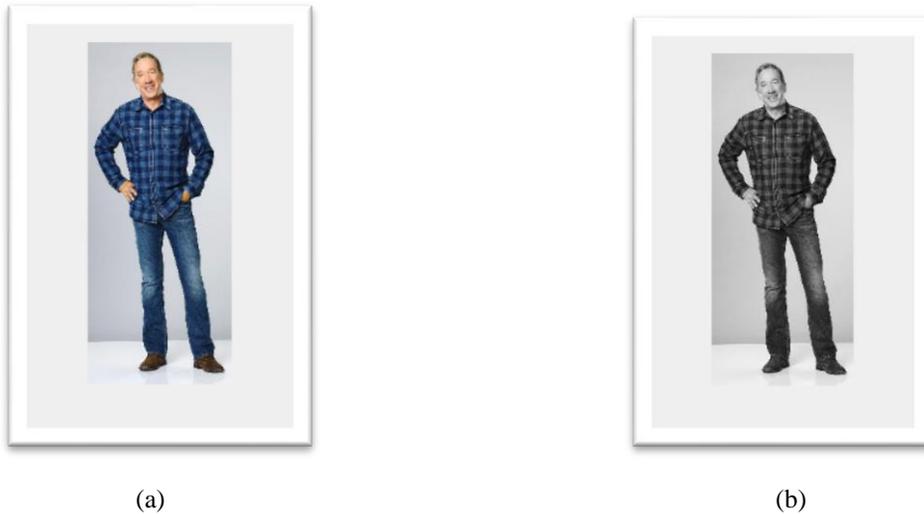


Fig.1 Block Diagram for Virtual Fitting Room

Image Categorization is the procedure that recognize the image classes and bringing up the worldwide semantic kind of an image. Here, we need to recognize the class of an image[5]-[6]. One conceivable situation for a customer application is to bunch a photograph collection, naturally, as indicated by classes. We have looked for do devise and send a procedure ready to consolidate significant data shared by basic precedents in substantial scale image databases. At first

the info shading image is changed over into the gray image. Fig.2 (a) and (b) demonstrates the information and its gray image individually. Black and white image is gray scale image. Gray scale is a scope of monochromatic shades from black to white consequently a gray scale image contains just shades of gray and no shading. This procedure expels all shading data, leaving just the luminance of every pixel.

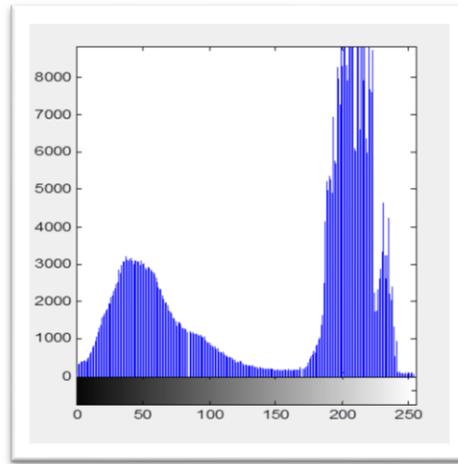


**Fig.2 shows the a) Input Image b) Gray image**

## **HISTOGRAM**

A histogram is a platform of realistic data that demonstrates the recurrence of information things in progressive numerical interims of equivalent size. In histogram, the horizontal axis is plotted with self-determining variable and the vertical axis is plotted with the reliant variable. A picture histogram is a sort of histogram that goes about as a graphical portrayal of the tonal changes in picture splendour and difference would thus be able to be acquired. Histogram equalization is a system for altering picture forces to improve differentiate.

Histogram normalization is one of the methods for enhancing the contrast of images. In this method, by using its normalized cumulative sum. Fig.3 shows the original image intensity values which are mapped to new intensity in order to give a uniform histogram of intensity values. The histogram of an image normally refers to a histogram of the quantity of pixels in a picture at each extraordinary intensity esteem found in that picture. Intensity refers to the numerical value of a pixel. In gray scale images, its depicted by the gray level value at each pixel. It is the process by which certain features of interest within an image are detected and represented.



**Fig. 3 Histogram image**

### **CONTOUR DETECTION**

Shape is a important visual feature and one of the basic features for picture content portrayal. Shape content representation cannot be characterized precisely on the grounds that estimating the similarity between shapes is troublesome. In this way, two stages are basic fit as a fiddle based picture recovery, they are: feature extraction and similarity estimation between the separated features. Shape descriptors can

be isolated into two principle classifications: district based which utilize the entire region of a question for shape depiction and contour based which utilize neighbourhood features as boundary segments [6]. Fig.4 demonstrates the Feature Extraction of a picture. Feature extraction depends on the known morphological actualities of human structure. The shoulder and hip focuses are discovered precisely which assumes an essential job in exact fitting of clothing.



**Fig. 4 Feature Extraction**

### WARPING OF SHIRT AND PANT

The sample shirt and pant are selected for fitting must be resized according to the size of the person. Thus the sample shirt is warped to the silhouette of the image by taking feature points as reference. Fig.5(a) and (b) shows the silhouette of pant and shirt, respectively. Warping is the technique by which image is made to resize and reshaped such that one images superimposes over another image of similar contour [10][11].

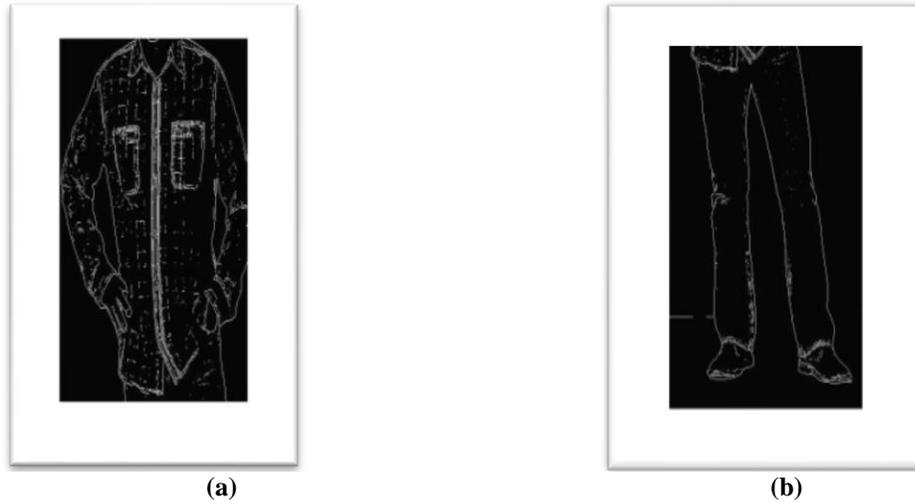


Fig.5 (a) and (b) shows the Extracted image of shirt and pant

### 4. RESULTS

Using this extracted image of shirt and pant, we can compare many shirts for our fitting [7]-[8]. Fig.6 and 7 shows the Implementation of virtual fitting room by selecting the choice of shirt or pant size of our choice.

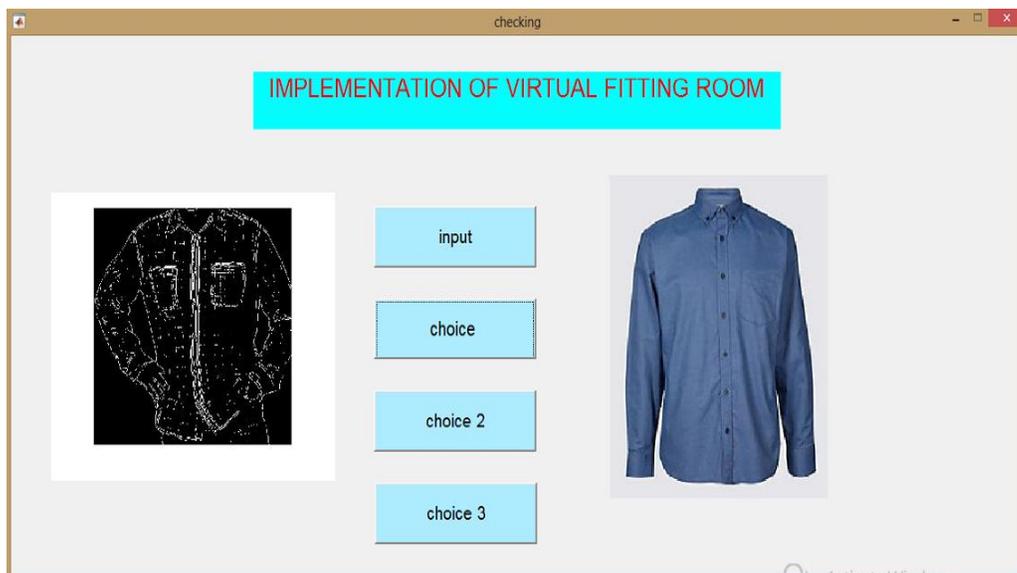
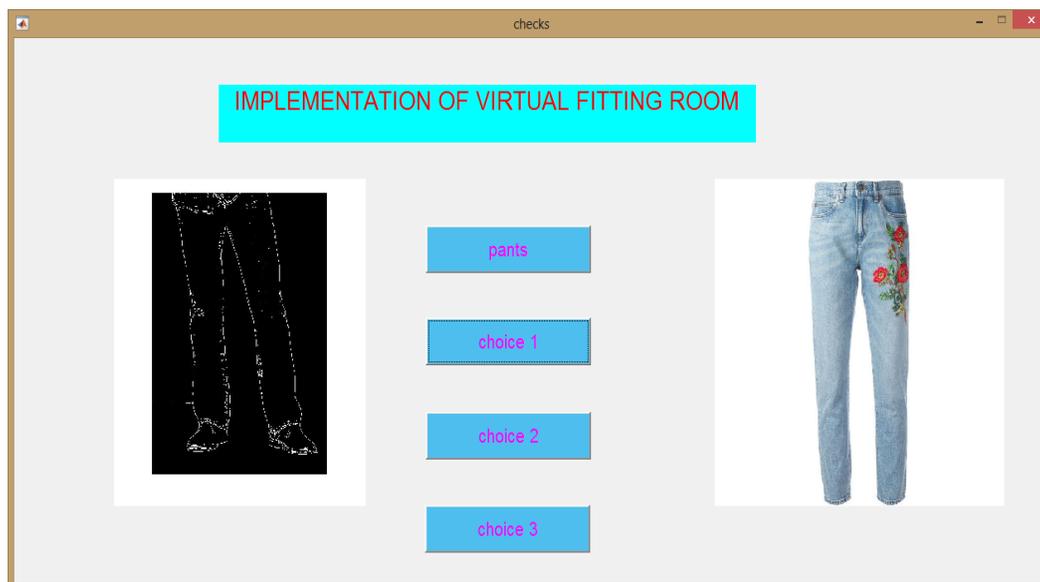


Fig.6 Implementation of virtual fitting room for shirt



**Fig.7 Implementation of virtual fitting room for Pant**

## 5. CONCLUSION

Therefore, to produce a virtual room that realistically reflects the looks and also the behaviour of garments. It should further adapt to specific bodies of different persons depending on their body measurements. This will be one among the most challenges since the items of fabric ought to properly fit as several persons respective of individual dimensions. Technically speaking, the fitting room will be based on the Microsoft Kinect, an innovative technology which provides a new way of interaction between humans and the computer. Overall, the presented virtual dressing room seems to be good solution for a quick, easy and accurate try-on of garment[9]. The Microsoft Kinect offers the optimal technology for a successful implementation. From this point of view it is an optimal addition for a cloth store. Beyond that a simple set up of the system can also be assembled at home since the minimum requirements are a computer with a screen and a Kinect. This can additionally end in an extra feature for an online look. It would allow a virtual try-on of clothes before people are buying it online taking a closer look at the garment and even conveying the actual behaviour of the real cloth.

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