



A Survey on Enhanced Virtual Fitting Room

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Abstract: With recent advance in web technology, many online shopping websites have been emerged. Despite its advantages, however, online shopping presents certain drawbacks. One drawback is that it may be difficult for a person to visualize how a given article would look if worn by that person-owing to the rich variation in body size and shape, hair and skin colour, etc., in the human population. Testing the fitness of clothes is highly important for both customer and trader. Our approach concentrates on how the selected garment fitted the user's body and how it will be appear as if he/she in real world. 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 tries on by creating a virtual dressing room environment. The implemented system introduced an advanced methodology which is presented for the purchase of clothing through a virtual fit on platform, which consumes far more less time than the normal process, making it easier for the both seller and customer. This provides a realistic behaviour for the suitability of the garment's details. The whole process starts from an image of the user which is captured from the webcam which then and there provides an environment of a virtual dressing room. Customers are able to select clothing designs from a range of different garments as they prefer and those can be tried onto the image which allows them to experience a live view of the outfit as if it worn on their own body. The primary aim of this project was to build up a compelling, interactive, and highly realistic shopping experience via a desktop application providing the user a reliable and accurate service to access an environment of a virtual try on system.

Key words: Virtual Try On, Visualization, Virtual fitting, trial, augmented reality, room.

1. INTRODUCTION

E-commerce, which is defined as the sale of products and services through the Internet, generates a lot of data. There has been a USD 1,336 trillion increase in the total value of online items and services between 2014 and 2018[1], Another indicator of e-commerce growth is the increasing percentage of online e-commerce sales against total sales (online and offline). Compared to the previous year, online sales accounted for 10.2% of total global sales in 2017. (Bakopoulos, 2019). Several factors have contributed to this, but one of the most significant is the propensity of Internet users to make clothes purchases. commerce's Statistics show that clothing is the most popular online category worldwide, and it brings in a lot of money[2]. Clothes are an excellent choice for online shopping due to the many advantages. This means you must be able to rapidly compare offers from multiple suppliers, swiftly adjust your offer in reaction to change fashion trends (including discounts), and make purchase as simple as possible if you want a wide range. As a seller, you have a unique set of challenges since the buyer wants to customise the product to fit his or her specific body type or skin tone. This industry has a higher return rate than others in ecommerce. Returns may account for as much as 60% of overall sales, posing a significant problem for internet-based enterprises. One solution may be to use a virtual fitting room (hereinafter VFR). Anyone may virtually try on clothing before purchasing them using the VFR. This allows them to compare things like size, fit, style, and colour. This gives the ecustomer a sense of how it will look in other items before purchasing it. Customers benefit from VFR since it acts as a "virtual mirror" to help them make better purchasing selections. Generation Y's proclivity to utilise VFRs in buying choices is the subject of this study. VFR is having a hard time gaining traction since it is still a relatively new option for online retailers. This means that Internet users, especially those

from generation Y who are adept at using information and communication technologies, have never heard of VFR before. Preliminary research is thus necessary to assess whether VFR may be employed.

Idea and types of the virtual fitting rooms

Year	World		Europe	
	Turnover (in billions USD)	Change	Turnover (in billions EURO)	Change
2014	1336	NA	328	NA
2015	1548	15.87%	386	17.68%
2016	1845	19.19%	429	11.14%
2017	2304	24.88%	489	13.99%
2018	2842 E	23.35%	547	11.86%
2019	3453 E	21.50%	621 E	13.53%

Key: E-estimate, NA-not applicable

To ensure that a piece of clothing appears as good on the customer as it does on the VFR, they must use a computer or smartphone screen. It is really specialised software that allows consumers to examine how their physique would seem when dressed as a model [20]. Therefore, there are two types of variables needed: information on the customer's body size (height, neck and bust measurements) and information on the size of the chosen garment, which should take into account the degree of elasticity of fabric used to make it in addition to those sizes mentioned above. However, depending on whether we're utilising 2D or 3D modelling, the approach of customizing the apparel to the client's physique vary.

The basic criteria for splitting VFRs is the number of mapping dimensions. AR technology enables VFR in two dimensions. Augmented reality (AR) combines real-world images with computer-generated graphics (CG) in real-time, similar to integrated artificial pictures in real-time[21]. In order for AR solutions to collect real-world data, a camera is required. Researchers have been studying the possible sales advantages of augmented reality since the advent of the twenty-first century[22]. Two-dimensional VFRs are a potential option in this situation. VFR in two dimensions is shown in Figure No. 3. (also referred to as a 2D overlay in the text).

2.METHODS OF DETECTION

Mean shift is a clustering technique, as opposed to Unsupervised learning, which randomly assigns data points to groups based on how far they are from the mode (mode is the highest density of data points in the region, in the context of the Mean shift). Because of this, it's often referred to as the Mode-seeking algorithm. The mean-shift approach is useful in image processing as well as computer vision. Sort KDE is a form of mean-shift based on the idea of estimating the density of the kernels themselves. Think about it this way: the data you just read came from a probability distribution. λ It works by giving each piece of data in the collection a unique kernel. A weighting function used in convolution is known as a kernel, and it is a fancy mathematical name for it. By combining all the individual kernels, a density function for a probability surface may be generated. Because of this, the density function generated will be different based on the selected kernel bandwidth. For unsupervised learning, it's yet another excellent clustering strategy. To distribute data to clusters repeatedly, the mean-shift method shifts the cluster centroid's points in the direction of that point's highest density in the data set.

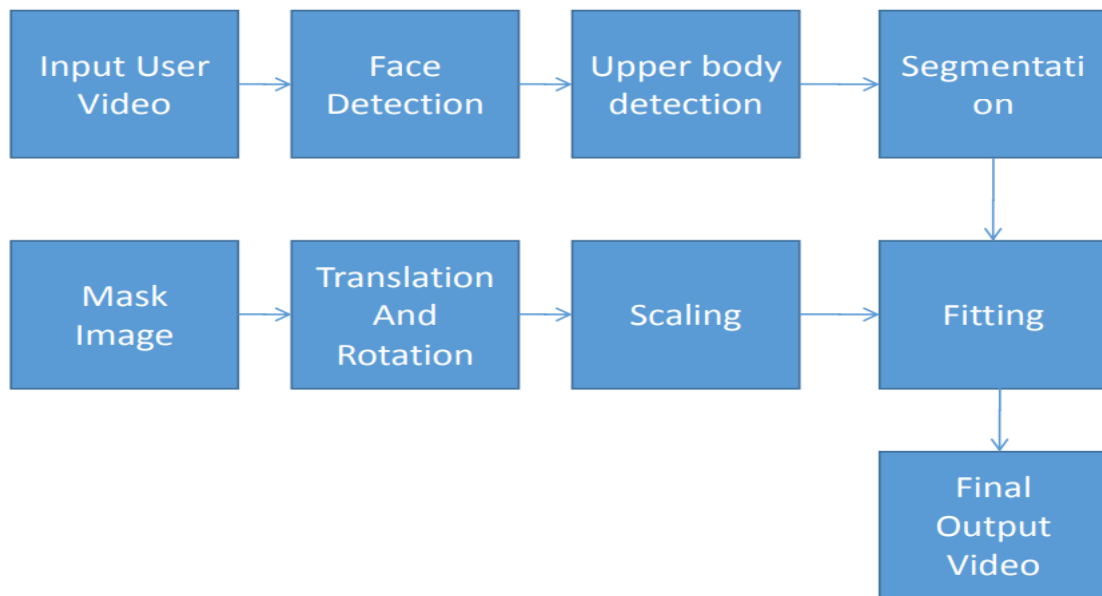


Figure No.: 50: Flow of the system

3. SURVEY PAPERS

The current methodology of on-line searching doesn't guarantee the right size of the wear. This result in a number of products being returned and the time taking to replace it with the correct sized one is long. This is a major setback for the online shopping industry. The various approaches to obtain the desired results are as follows,

Srinivasan K. and Vivek S. [1], in proposed system they should discussed about the growth in online shopping. A person wants to purchase the dress with full satisfaction and also enjoy maximum utilization and justifies the need to develop an algorithm which virtually dresses people with the selected dress. Human silhouette with variable background and noisier environment. Which is the more challenging task in still image using image processing?

Pros: The wide choice of online availability with the assistance of feeling how clothes would look. Cons: No provision for 3D viewing and sensitive to light conditions.

Ari Kusumaningsih and Eko Mulyanto Yuniarno [2],A virtual dressing room for Madura batik dress has been successfully developed. The proposed system has a purpose tom make dressing room specialized for Madura batik clothes supposed to create attention from customer and should contributes in improving sales performance and promote Madura's heritages as also. Efficient and fast computation methods needed to process numerous 3D models. So that, we don't have to use high performing computer for implementing this virtual dressing room. Pros: The distance of objects from the Kinect and to compose a "depth map" of the image.

Cons: Lighting conditions affected depth map.

Ting Liu and Ling Zhi Li [3], work uses user extraction from Kinect video stream and avatar system for skeletal tracking to align the clothes' models with users. And a virtual dressing software prototype is developed allowing clothes' 3D models to overlay users and were convenient to view in front, side and back perspectives. Furthermore, improving clothes modeling approaches that achieve rapid reconstruction based on real clothes is also of great use. Pros: The user can view the real-time collocation effect with the change of hats' textures and clothes 'models.

Cons: Only alignment of clothes according to body is used and dynamic movement is not considered.

Stephen Karungaru and Kenji Terada [4], in this Project, they propose a method to acquire human body length / perimeter easily using Kinect. Experimental results confirmed that human data can be acquired from Kinect sensor. We also confirmed problems in case of

error in acquired data. Future issues include improving the accuracy of acquisition of person's data and the CG. Pros: Most work is focused on acquiring human data. Cons: No interactive activities are focused and as they say accuracy is low. Human data is acquired and not used

Dr. Anthony L. Brooks and Dr. Eva Petersson Brooks [5], the open-structured surveys received wide-ranging input from the public attending the live demonstrations at Malls and Messe events. 13 wheelchair-bound individuals gave direct input as well as others who were either friends or associated with a wheelchair-bound person that they considered would benefit from a dedicated adaptation of the product. Yet that distance had to be shut enough to permit the person associate degree operable read of the interface management detail.

4. CONCLUSION

Here only a front image is required in the virtual fitting room application. For every product to layer it on user and two dimensional graphics of given product appear to be comparatively acceptable and real for multiple uses. Given approach is used for range the models with user and to test the system in many states. This system covered all drawbacks and demonstrations have resulted with allowable presentation rates for general positions. According to the model used for fitting there are many possible implementations. This should be attainable for use a similar variation to the pictures instead of straightforward scale-rotate ability for matching many joints altogether though it'd necessary additional estimation. Many pictures at different angles should be used because of it; it is feasible for creating more practical video stream. Anyone should bring a same effect using three-dimension models and also provide them according to ongoing angle and position. To go along with the model another point of view should make it easy and feasible for implementing physics engine.

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