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# Virtual Trial Room using AI

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**ABSTRACT:** The sheer potential of time spent shopping can always lead to consumers being skeptical about the clothing industry. Therefore, in e-commerce, customers can buy many new clothes, thus saving money and time. There are some restrictions on trying on clothes before purchasing them from e-commerce. However, this offer allows customers to experience the fit they want. The main purpose of the project is to recognize the consumer's clothes before purchasing them and thus improve the consumer's decision-making process. A virtual trial room system improves the accessibility of the garments virtually without any discomfort, enhances customers to feel free to try the fit, comfortable to engage with the environment and there are fewer chances of returning and cancelling products. It detects the customer's posture and provides 2D virtual garments that are adjusted according to the posture, thus predicting the right fit by measuring the height and width of the body. This application provides interactive, rich and engaging surroundings to the clients.

**KEYWORDS:** virtual try-on; Machine Learning; 2D virtual garments; apparel; virtual trial room.

## I. INTRODUCTION

In stores usually it takes more time to change the clothes or trying clothes. In online shopping, we cannot try clothes. In proposed system we will try to upgrade use of cloth in less time [8]. For this method, we will create an environment that must be a valid room and must be virtual [1]. The main problem of this system is to adjust, place, rotate, rotate and sort according to the fabric pattern and ideal condition [2]. The most important part of this problem is the elimination of users and their bodies [4]. Many methods have been proposed in the literature for user body parts detection, skeleton tracking and pose approach. For online business clients, use a simple webcam. To make platform independent approach and portable approach we should implement this by using OpenCV and python.

## II. LITERATURE OVERVIEW

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,

**Title:** High-Resolution Virtual Try-On with Misalignment and Occlusion-Handled Conditions

**Year:** 2022

**Author:** Sangyun, Lee, Gyojung Gu, Sunghyun Park, Seunghwan Choi & Jaegul Choo

**Key points:** We propose a novel architecture for high-resolution virtual, which performs warping clothes and segmentation generation simultaneously while exchanging information with each other.

**Limitations:** The existing image-based virtual try-on approaches assume that test data is drawn from the same distribution as the training data.

**Title:** The emperor's new clothes: self-explorative engagement in virtual try-on service experiences positively impacts brand outcomes

**Year:** 2022

**Author:** Virginie Lavoye and Jenni Sipilä

**Key Points:** Virtual try-on (VTO) technology offers an opportunity for fashion and beauty brands to provide enriched self-explorative experiences

**Limitation:** we only discuss the exploration of styles via VTO but do not investigate the deeper meaning of such exploration

**Title:** Style-Based Global Appearance Flow for Virtual Try-On

**Year:** 2021

**Author:** Sen He, Yi-Zhe Song, Tao Xian

**Key Points:** We have proposed a style based global appearance flow estimation method to warp the garment for virtual try-on.

**Limitation:** sometimes cannot accurately predict the local fine-grained appearance flow

**Title:** M2E-Try On Net: Fashion from Model to Everyone

**Year:** 2019

**Author:** Zhonghua Wu, Guosheng Lin, Qingyi Tao, Jianfei Cai

**Key points:** We have presented a novel virtual try-on network M2E-TON which can transfer desired model clothes to target person images automatically

**Limitation:** Our method typically fails in the cases where there is a head pattern on the clothes

**Title:** Smart Virtual Trial Room For Apparel Industry

**Year:** 2019

**Author:** Mohamed Soltani ; Hafeed Zarzour ; Mohamed Chaouki Babahenini

**Keypoints:** 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. Silhouettes of people with different backgrounds and loud voices. Which role is more difficult for still images to use?

There is a wide range of selection available online with the help of thinking about how the clothes will look.

**Limitations:** Inability to see 3D and understand lighting conditions.

**Title:** VITON: Image-based virtual trial network

**Year:** 2018

**Author:** Han Xintong, Wu Zuxuan, Wu Zhe, Yu Ruiyi, Larry S. Davis

**Keypoints:** A virtual dressing room for Madura batik clothing has been completed. The aim of the scheme is to provide a dressing room for Madura batik clothing to attract customers and help promote sales and promote Madura tradition. Processing large numbers of 3D models requires efficiency and speed. Thus, we do not need to use a high-performance computer to use this virtual locker. The distance between the object and Kinect gives "depth" to the picture.

**Limitations:** Lighting affects the depth map.

### III. PROBLEM DEFINITION

In Virtual dressing rooms for the fashion industry and digital entertainment applications aim at creating an image or a video of a user in which he or she wears different garments than in the real world. Such images can be displayed, for example, in a magic mirror shopping application or in games and movies. Current solutions involve the error prone task of body pose tracking

### IV. RESULTS AND DISCUSSIONS

This project consists of developing an AR virtual fitting room application using augmented reality and computer vision technologies for smartphones. Basically, the proposed application is built on webbased platform. laptop camera is the main requirement to detect, recognize and track human body movements in order to interact with the proposed application content such as virtual garment in real-time. The Graphical User Interface (GUI) of the application is designed as simple and easy to use in order to make it applicable to people in all age groups. The garment catalogue, garment details and camera preview are the necessary and main user interfaces in this application. Therefore, user interfaces should be designed and built according to heuristic principles that are easy to learn, efficient, easy to remember, error-free and satisfactory in terms of usability. Additionally, the study of human anatomy and movement patterns is used to describe and analyze human skeletal functions. Stream real-time video to the model to get classification results. The process is shown in Figure 1. Existing clothing is also modeled based on human skeleton-based joint detection, body measurements, and clothing measurements to fit the same human body. In short, the AR virtual dressing room mobile application on the webbased platform was developed by combining human body detection and model tracking.

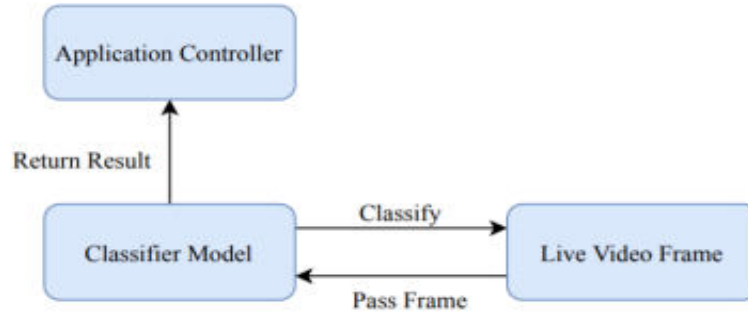


Fig 1: Pose Estimation

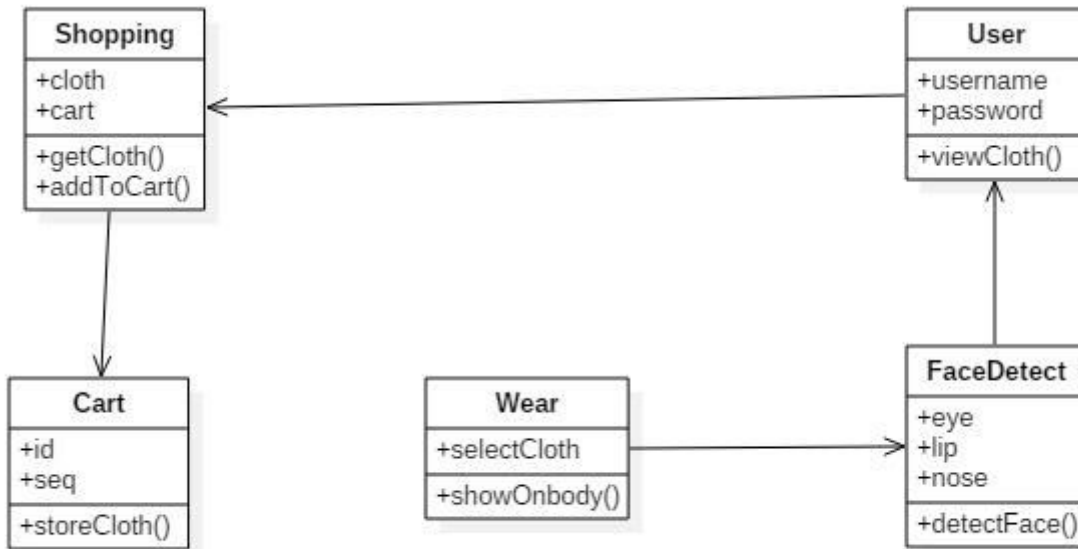


Fig 2. Class Diagram

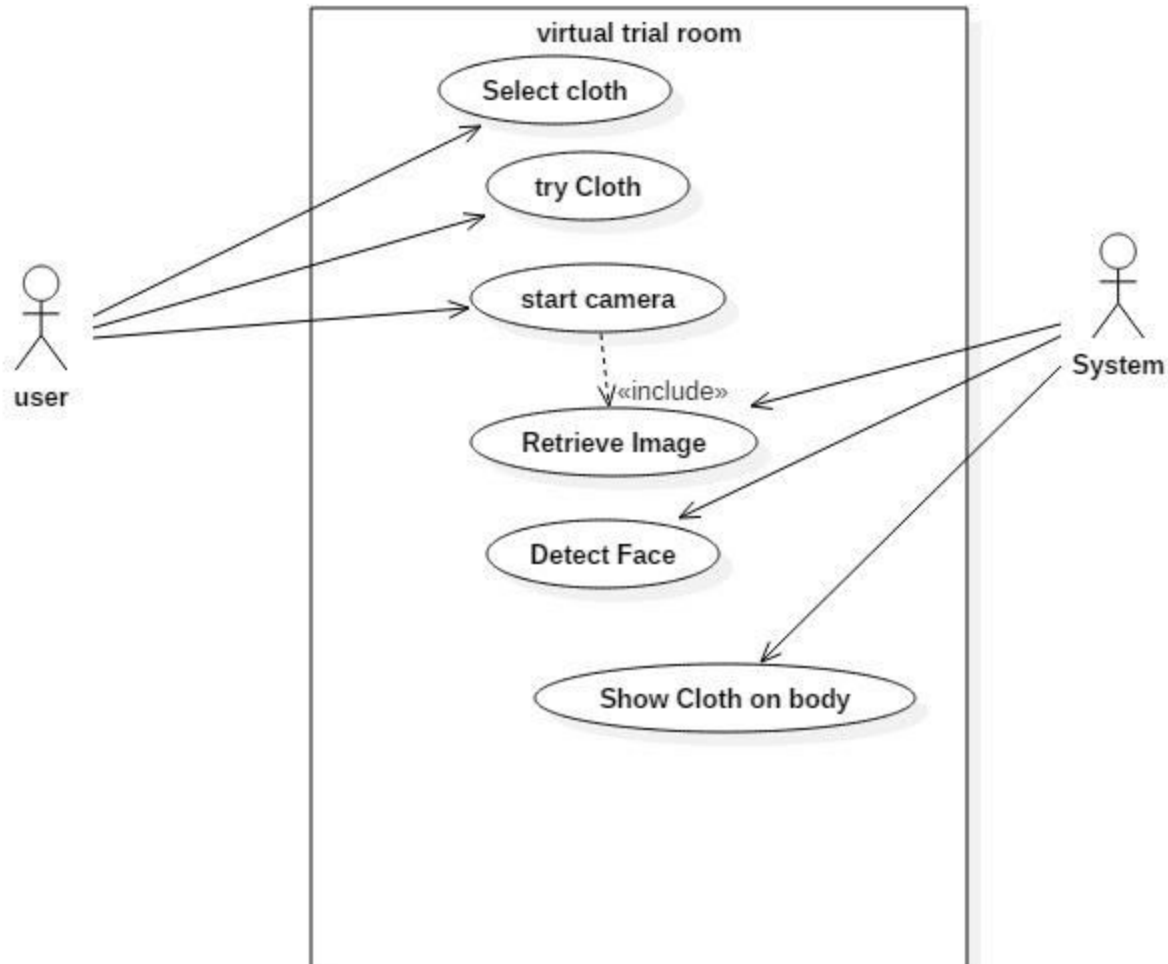


Fig 3. Use case Diagram

## V. CONCLUSION

The latest developments in online shopping allow consumers to shop anytime and anywhere. Although online shopping has many advantages, there is a big problem that prevents people from shopping online; That is, not being able to try products, especially clothes. On the other hand, shopping for clothes can be a boring and difficult task for some customers who do not want to waste time in the dressing room. In fact, customers want to be able to save time, save money and check more easily which clothing sizes and styles are available, whether online or in stores. That's why this project was designed to create an AR virtual fitting room that allows customers to try on clothes without having to try them on themselves. In this project, the AR virtual locker room application was designed to be lightweight and efficient, and can run on inexpensive hardware like web-based applications. Therefore, users only need to install the application to realize the AR and human detection system, without needing to install the entire system. Additionally, the app's Graphical User Interface (GUI) is easy to use and suitable for people of all ages. Users can start using it quickly and easily. Essentially, use the camera to capture, identify and track the human body to interact with app content. Pose estimation is used to describe the human skeletal system so that the body can move in time. Physiological measurements can be obtained by calculating the distance between each detected bone. Then the clothing model is suitable for the human body according to the human bone joint function, body size and clothing size.

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