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A STUDY ON AUGMENTED REALITY VIRTUAL DRESSING SOLUTIONS

Prof.Prathamesh Bajare [1], Shivani kumari [2], Swarali Tantak[3] , Anjali chinchore[4]

[1]Assistant Professor , Department of Computer Engineering , NBNSTIC , Pune , India

[2,3,4,5] *Student , Department of Computer Engineering , NBNSTIC , Pune , India*

Abstract - The development of virtual reality technology has made it feasible to replicate the offline shopping experience online. A technology called Virtual Dressing employing Augmented Reality allows users to virtually try on clothing. This tool will assist the user in making a more accurate assessment of how the dress will appear on him because users cannot physically try the garment on in the online mode. The suggested system consists of an application that allows users to utilize only their photos to generate 3D models. Users may then apply garments to their models, which can be viewed in augmented reality (AR) space to determine how the models seem on different people.

Key Words: AR computer vision , Body Tracking , Pose Estimation , Augmented Reality , ACM (Augmented Cloth Manipulation) , Data Privacy

1.INTRODUCTION *(Size 11, Times New roman)*

Online purchasing platforms are growing as a result of the pandemic. A greater number of people are shopping online. However, customers are hesitant to purchase in the apparel department since they cannot try the garments on online, which means they will not have the same experience as they would if they were shopping in person. Both the suppliers and the customers are affected by this. Thus, a virtual trial room is required for online platforms.

With the development of augmented and virtual reality technologies, it is now feasible to add this capability to an online platform. A system that allows users to apply clothing to their 3D models, which can be viewed in augmented reality, and build 3D models using only their photos could be developed. A technology called augmented reality (AR) blends virtual data with the physical world. Augmented reality has received a lot of attention and has produced good applications in marketing, social networking, art, and navigation . In order to help consumers better understand a product, the Virtual Fitting Room (VFR) is an application of augmented reality (AR) that blends the real physical environment with virtual product effects . It falls under the category of MR, a subset of AR .

2. Body of Paper

2.1 Problem Statement:

To develop a system that allows people to upload their own photos and virtually try on clothing. The task is to appropriately position the selected apparel items on the user's image while maintaining a realistic and pleasing appearance. By enabling customers to see how the clothing will fit them before making a purchase, the goal is to improve the online buying experience.

2.2 Proposed Solution:

Incorporate interactive elements into the virtual try-on experience using virtual reality. To create a more interactive and customized experience, gesture-based controls might be implemented, enabling users to move virtual mirrors, alter perspectives, and manipulate apparel items. Provide sophisticated options for customizing avatars in the virtual reality setting. Enable users to generate incredibly realistic and detailed digital avatars of themselves, guaranteeing a more accurate virtual version for trying on clothes. Make sure that cross-platform AR try-on experiences that rely on VR are compatible. To ensure accessibility and convenience, users should be able to switch between VR headsets, AR applications on smartphones, and web platforms with ease.

Learn everything there is to know about market trends, user preferences, technological limitations, and virtual try-on technologies. To find out what prospective customers want and dislike about online shopping and virtual try-on experiences, do surveys and interviews with them. Hold brainstorming meetings to produce creative concepts for functionality, user interfaces, and technology advancements.

2.3 ESTIMATES OF PROJECTS

1. Requirement collecting and analysis: In this waterfall phase, we determine what kinds of needs, such as database management and interfaces, hardware and software requirements, are necessary for our project.

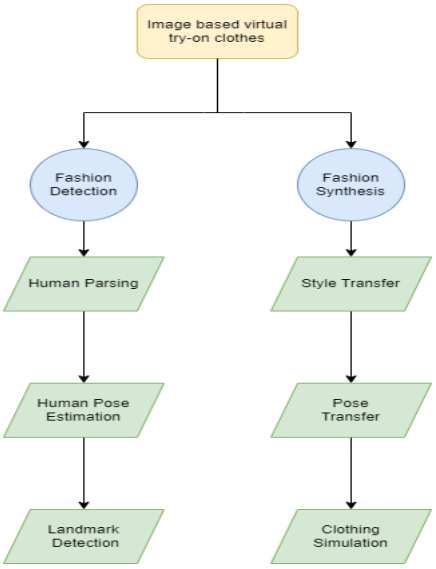
2. System Design: During this stage, we create a user-friendly system that is simple to understand for the end user. We create data flow diagrams and UML diagrams to comprehend the system's flow, modules, and execution order.

3.Implementation: We have implemented the various modules needed to successfully achieve the desired results at the various module levels throughout the implementation phase of our project. The system is initially constructed in tiny programs known as units using inputs from the system design; these units are then combined in the subsequent phase. Unit testing is the process of developing and evaluating each unit for functionality.

4. Testing: Various test cases are run to see if the project module produces the desired results in the anticipated amount of time. Following each unit's testing, all of the units created during the implementation phase are combined into a single system. The entire system is tested for errors and malfunctions after integration.

5. System Deployment: Following the completion of both functional and non-functional testing, the product is either released into the market or deployed in a customer environment.

6.Maintenance: The client environment can present some challenges. Patches are published to address certain problems. Better versions of the product are also released in order to improve it. To bring about these modifications in the consumer environment, maintenance is carried out.



2.4 Application:

1) It improves the online shopping experience by enabling shoppers to digitally try on clothing before making a purchase.

2) Retailers can exhibit their items and boost customer engagement using this technology.

3) fashion apps and websites can incorporate image-based virtual try-on, giving customers an engaging and customized opportunity to explore various styles and sizes.

4) It also raises consumer satisfaction and lowers returns.

5) To provide users plenty of options to try on, the program should contain a big assortment of virtual clothing items, such as dresses, tops, bottoms, shoes, and accessories.

6)To fit their tastes and body shapes, users should be able to alter the size, color, pattern, and other characteristics of the virtual clothing items.

3. Literature Survey

1) Title of Paper: Context-Driven Image-Based Virtual Try-On Network (C-VTON) Benjamin Fele and Ajda Lampe are the authors.

Description: On fashion-focused e-commerce platforms, image-based virtual try-on techniques have demonstrated great promise for improving customer satisfaction and the user experience. However, the quality of the try-on results that can currently be obtained from input images with varying characteristics is still limited by the techniques that are currently in use. In order to overcome these limitations and convincingly transfer specific clothing items to the target subjects even in the face of self-occlusion and difficult pose configurations.

2) Title of Paper: Virtual Try-On with Multiple Pose Using 3D Clothing Reconstruction

THAI THANH TUAN, MATIUR RAHMAN MINAR is the author.

Abstract: Deep generative models-based image-based virtual try-on (VTON) systems have garnered a lot of interest lately. Nevertheless, the 2D clothing shape transform techniques used in the previous studies have significant limitations when it comes to the 3D clothing deformation needed in multiple-pose VTON scenarios.In this work, we design a 3D-MPVTON system consisting of two pipelines and demonstrate that, for the multi-pose VTON scenario, a 3D clothing model reconstruction approach yields significantly better results. First, CloTH-VTON+ serves as the foundation for the 3D clothing model reconstruction pipeline.

3) Title of Paper: Virtual Try-on Network Based on Images and Unpaired Data

Writer: Assaf Neuberger Borenstein Eran
This article introduces a novel image-based virtual try-on method called Outfit-VITON, which facilitates the visualization of how an ensemble of clothes chosen from different reference images fits a subject in a query image. There are two unique characteristics of our algorithm. First off, it's cheap because all it needs is a sizable collection of individual, non-corresponding photos both real and catalog of people dressed differently without the need for explicit 3D data.

4) Article Title: FIT-ME: VISUAL TRY-ON BASED ON IMAGES WITH ARBITRARY POSES

Chia-Wei Hsieh and Chieh-Yun Chen are the authors.
Explained:Although the image-based virtual try-on system has drawn attention from researchers lately, uploading an image of a user in the desired pose is still necessary. We introduce Fit-Me network, a novel learning model that can both seamlessly fit clothes from the store into an image of a person and change the person's pose to a different one at the same time. In addition to saving users the time it takes to physically change clothes, the proposed Fit-Me network offers detailed information about how appropriate the clothing is.

5) Paper Title:VITON-GT: An Image-based Virtual Try-On Model with Geometric Transformations Authors: Matteo Fincato and Federico Landi

Description: In this work, we introduce VITONGT, a novel virtual try-on model that employs multiple geometric transformations to produce high-quality and photo-realistic images. Specifically, our model consists of a two-stage geometric transformation module that executes two distinct projections on the input garment and a transformation-guided try-on module that synthesizes the new image.

6) Title of Paper: Investigation and Creation of Virtual Try-On System Utilizing Mobile Platform

Jing Tong and Hongqiang Zhu are the authors.
Description:To address the issues of high costs and conflicts between simulation effects and computational complexity, a mobile-based virtual try-on system is proposed. This paper includes multiple modules, including auto-skinning, real-time local cloth simulation, and automatic 3D face reconstruction from a single image.

7) Title of Paper: A Generative Network Based on Flow for Photo-Realistic Virtual Try-On

Author: XIAOLING GU, TAO WANG
Description:The goal of image-based virtual try-on systems is to project the outfits onto a desired individual. Despite recent significant advancements, occlusion and severe spatial deformation pose significant challenges for real-world applications of such systems. We suggest a brand-new Flow-based Virtual Try-on Network (FVTN) to solve the problems..

8) Title of Paper: Deep Learning-Based Image-Based Virtual Try-on System: An Overview

Hajer Ghodhbani and Mohamed Neji are the authors.
Description:Technology has advanced quickly in recent years for a variety of industries, most notably the apparel sector, which seeks to meet the needs and wants of its customers. Fitting clothes before making an online purchase is one of these requirements. To guarantee the online shopping experience, a lot of research has been done on how to create an intelligent apparel industry.

9) Title: Virtual Try-On System Employing Machine Learning Techniques

Author: Dhanashree Gaikwad, Prof. Nilesh Bhojane1,
Description: This paper presents a pixel-free virtual try-on system for clothing shopping that produces high-resolution virtualization. The system makes use of a Parser Free Appearance Flow Network, which exchanges data while warping clothing and creating segmentation. By using the Frechet inception distance (FID) performance metric, it can be seen that the suggested methodology performs better than the current virtual fitting methods at 192 x 256 resolution.

CONCLUSIONS AND FUTURE SCOPE

sum up, image-based virtual try-on technology for clothing provides a practical and customized shopping experience. Customers can virtually try on clothing, saving time and doing away with the need for physical changing rooms. Retailers can enhance customer engagement by showcasing their products in an immersive manner. It's crucial to take into account virtual tryon's drawbacks, though, including possible errors in fit and color representation. In general, it's a game-changing innovation that improves the convenience of online shopping and raises client satisfaction.
The fashion industry and online shopping experiences could be completely transformed by virtual dressing with augmented reality. Virtual try-on is about to reach new heights thanks to ongoing developments in AI, machine learning, extended reality, and other cutting-edge technologies.
Future developments in augmented and virtual reality (AR/VR) should see rapid expansion as the technology gets more sophisticated and widely available. Because AR/VR technology offers consumers, patients, and students new and innovative experiences, its integration in sectors like healthcare, education, gaming, and retail is expected to grow. AR/VR has the potential to completely change how people interact with digital content because of advancements in both hardware and software development tools. Hardware innovations include wearables, HMDs, and haptic technologies. Software development tools include AI and machine learning algorithms. Additionally, faster processing speeds will be made possible by the development of 5G and 6G networks, improving user experiences while lowering latency.

Additionally, educators can use immersive learning environments, reenact real-life scenarios, and give students hands-on experiences that help them bridge the gap between theory and practice thanks to augmented and virtual reality technologies. It is anticipated that these technologies will completely change the way we teach and learn as they continue to advance. As a result, educational institutions are urged to devote more time, funds, and manpower to integrating these technologies into the curriculum. While virtual reality can create immersive simulations that overcome the limitations of traditional classroom setups and increase student engagement, augmented reality can bring textbooks to life with interactive diagrams. Researchers and academics are urged to look into these developments and the methods used to implement them in the classroom.

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REFERENCES

[1] Minsoo Lee, Jaegul Choo, Sunghyun Park, and Seunghwan Choi. Vitonhd: High-resolution virtual try-on using normalization that takes misalignment into account. Pages 14131–14140, June 2021, IEEE/CVF Conference Proceedings on Computer Vision and Pattern Recognition (CVPR).

[2] Shintami Chusnul Hidayati, Jiaying Liu, Wen-Huang Cheng, Sijie Song, and Chieh-Yun Chen. A survey on computer vision and fashion.
54(4):1–41, ACM Computing Surveys, 2021.

[3] Jeanie Mary, Thibaut Issenhuth, and Cement Calauz'enes. Never Do Mask What You Don't Need to Mask: An Online Try-On Without Parsers.Pages 619–635 in European Conference on Computer Vision (ECCV) The year 2020.

[4] Yingjiao Xu and Hanna Lee. The fashion industry's classification of virtual fitting room technologies is based on the experiences of its customers. International Journal of Technology, Education, and Fashion Design, 13(1):1–10, 2020.

[5] Yi Yang, Yunchao Wei, Yunqiu Xu, and Peike Li. Self-Correction in Human Interpretation. Pages 1–12, 2021, IEEE Transactions on Pattern Analysis and Machine Intelligence.

[6] Jun-Yan Zhu, Ting-Chun Wang, Ming-Yu Liu, and Taesung Park. Spatially-Adaptive Normalization for Semantic Image Synthesis. Pages 2337–2346 in Computer Vision and Pattern Recognition (CVPR), 2019.

[7] Zhouyingcheng Liao, Gerard Pons Molll, and Chaitanya Patel. TailorNet: Predicting Clothing in 3D as a Function of Human Pose, Shape and Garment Style. Pages 7365–7375, in Computer Vision and Pattern Recognition (CVPR), 2020.

[8] Duygu Ceylan, James Hays, Amit Raj, Patsorn Sangkloy, Huiwen Chang, and Jingwan Lu. SwapNet: Garment Transfer via Images. Pages 679–695 in 2018's European Conference on Computer Vision (ECCV).

[9] Dan Casas, Miguel A. Otaduy, and Igor Santesteban. Clothing Animation for Virtual Try-On based on Learning. 38(2):355–366, Computer Graphics Forum, 2019.

[10] Anna Khoreva, Bernt Schiele, Juergen Gall, Dan Zhang, Vadim Sushko, and Edgar Schönfeld. Adversarial Supervision is all that is required for Semantic Image Synthesis. Conference on International Learning Representations (ICLR), 2021