Virtual TrailRoom

1st Peter Soosai Anandaraj, 2nd Narasimha, 3rd Sri Sai, 4th Praveen

[1]Associate Professor, [2]Student, [3]Student, [4]Student

[1] Department of Computer Science and Engineering,

[1]Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology, Chennai, India

Abstract - A solution to the challenges faced by online shoppers in visualizing product fit and appearance. Leveraging advanced algorithms and computer vision techniques, the Virtual Trail Room provides a safe and convenient alternative for customers to try on clothes virtually. By accurately aligning virtual garments with the user's body using the Haarcascade algorithm, enabling real-time image processing with OpenCV, and incorporating face detection and tracking with Dlib, the Virtual Trail Room offers an interactive and realistic virtual try-on experience. The use of the LFW dataset from Kaggle ensures high accuracy and reliability. This transformative technology aims to improve customer satisfaction and reduce return rates in the online shopping landscape.

Index Terms - Virtualtrailroom system, Computer vision, Haarcascade classifier, Dlib,Real-time tracking, Label wild faces(LWF).

I. INTRODUCTION (HEADING 1)

The rise of online shopping has introduced a significant challenge for customers – the lack of a physical shopping experience. This issue has been further amplified by the COVID-19 pandemic, which has restricted access to offline stores. To address these challenges, the concept of a Virtual Trail Room has emerged as a smart solution. It offers customers a safe and convenient alternative to try on clothes virtually, providing a personalized shopping experience while reducing the risk of virus exposure.

Advanced algorithms such as Haarcascade, OpenCV, Dlib, and the LFW dataset from Kaggle are utilized in the Virtual Trail Room. These algorithms enable accurate detection of facial landmarks and contours, seamless virtual garment alignment, real-time image processing, face detection and tracking, and high accuracy and reliability. The Virtual Trail Room aims to revolutionize online shopping by allowing customers to visualize how products would look on them before making a purchase, ultimately enhancing customer satisfaction and reducing return rates.

II. LITERATURE SURVEY

Tuan et al [1] proposed a Multiple Pose Virtual Try-On Based on 3D Clothing Reconstruction, a mixed reality based virtual clothes try-on system using one consumable RGB-D camera, which includes three scenarios, i.e., (1) virtual clothes on the avatar, (2) virtual clothes on the actual user's image, and (3) virtual clothes on the avatar blended with the user's face image.

Masri et al [2] developed a Virtual Dressing Room Application, performance joint position, this application has become an acceptable application to provide a virtual fitting room for user to utilize Flexible and look-real cloth model for user to "wear".

Yousef et al [3] made a Kinect-Based Virtual Try-on System, proposed a VFR system with human friendly interface. This was done with the help of using the the Microsoft Kinect V2 RGB-D sensor and Unity 3D. The main purpose is to make the customers have trusted the regarding their choice because current on-line shopping.

Marelli et al. [4] proposed a Web Application for Glasses Virtual Try-on in 3D Space, A Web Application for Glasses Virtual Try-on in 3D Space. These considerations together with the opinions raised from the usability study can drive future developments. Finally, the web interface can be converted to a mobile application for ease of use and better integration with user devices.

Akshay Shirsat et al. [5] proposed a Augmented reality is the technology that expands our physical world, adding layers of digital information onto it. Augmented reality adds digital element to live view by using cameras or sensors. The main aim of this work is to develop virtual trial room using augmented reality which allows user to try on virtual clothes.

Hsieh et al. [6] implemented a Image-Based Virtual Try-on With Arbitrary Poses , propose a new virtual try-on system (FitMe) that can generates a virtual try- on images with arbitrary customer poses. By first transforming the pose of the user to a target pose according to the joints of the target pose, we warp the in-shop clothing to fit the target pose.

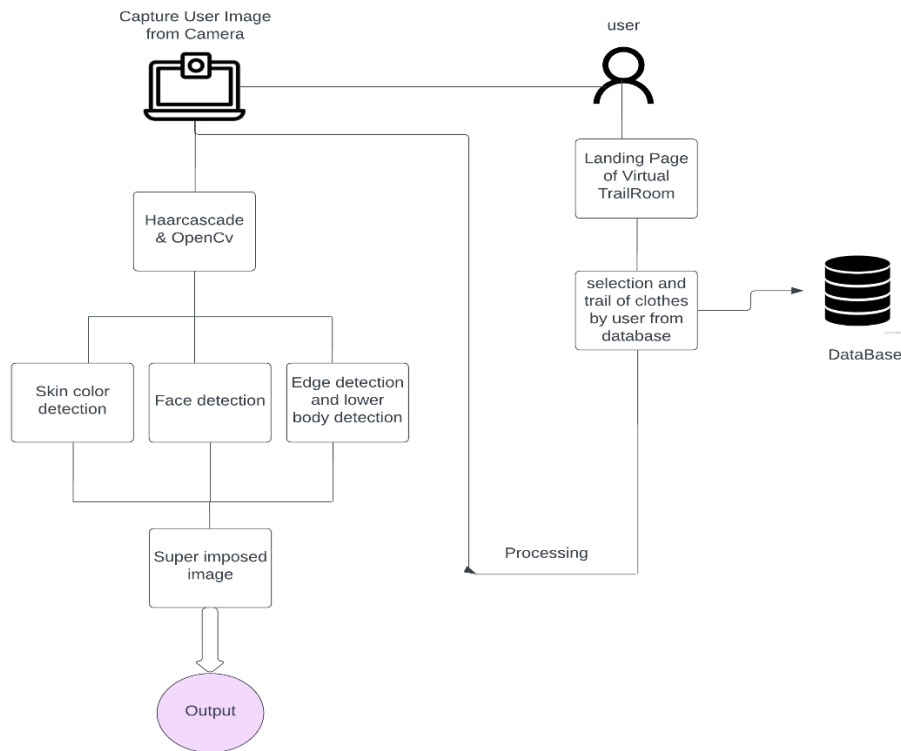**DESIGN PHASE**
Architecture Diagram

Fig.1 Virtual Try-On Architecture

An architectural diagram is a diagram for the Virtual Trail Room, which is an advanced platform that allows users to try on virtual outfits remotely. Users can browse through a database of outfits and select one to try on. The platform utilizes computer vision techniques, including skin color detection, facial detection, and edge detection, to ensure realistic outfit visualization. The system provides users with a live video feed that allows them to see themselves in the virtual outfit in real-time, from different angles. The development of the Virtual Trail Room involves stages such as requirements gathering, design, implementation, testing, and deployment, with a focus on meeting user needs and delivering a high-quality solution.
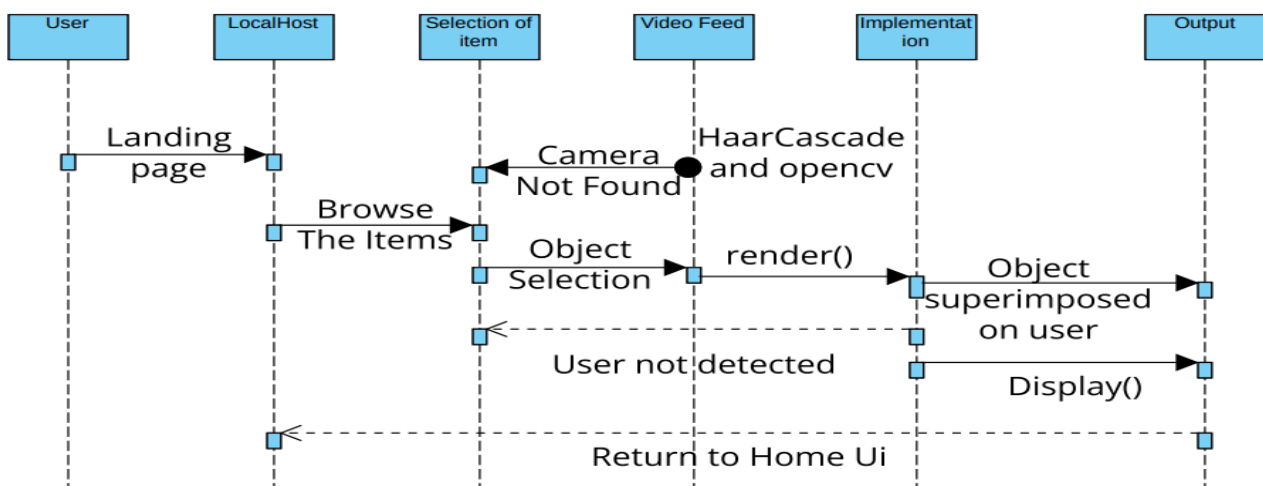
Sequence Diagram

Fig.2 Sequence Diagram

The user selects an outfit from the landing page, triggering the platform to process the user's image and the selected outfit using advanced computer vision techniques. The platform adjusts the outfit's colors to match the user's skin tone, accurately positions the outfit on the user's body, and seamlessly superimposes it onto the user's image using edge detection. The platform provides the user with a live feed video output that allows them to see themselves in the virtual outfit in real-time, enabling them to evaluate how it looks from all angles.

III. IMPLEMENTATION AND OUTPUTS

The landing page serves as the entry point for users and provides an intuitive interface for browsing the available outfits. The output of this phase would be a visually appealing and easy-to-navigate landing page that showcases the outfits and allows users to select their desired options.

Home Page

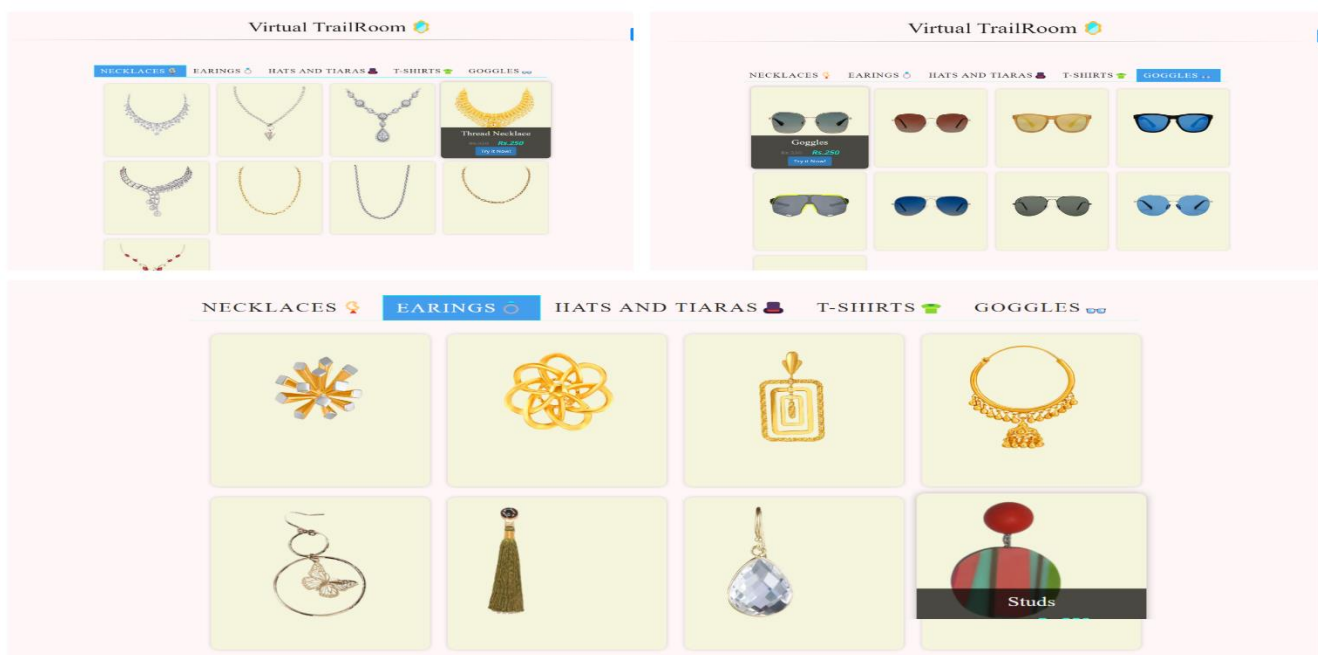Fig.3 Landing Page of Virtual Trailroom (Necklaces)

Fig.4 Landing Page of Virtual Trailroom (Other orinments)

The collection of various objects from web scraping tools such as Beautiful Soup, Scrapy, or Selenium to extract images from a website. These tools allow you to navigate the website's HTML code and extract the images you need. However, please note that some websites have terms of service that prohibit web scraping, so make sure to check the website's policy before scraping.

It has the implementation of the various objects that have been collected as input objects and these objects are superimposing finely and it is working successfully to get output designs
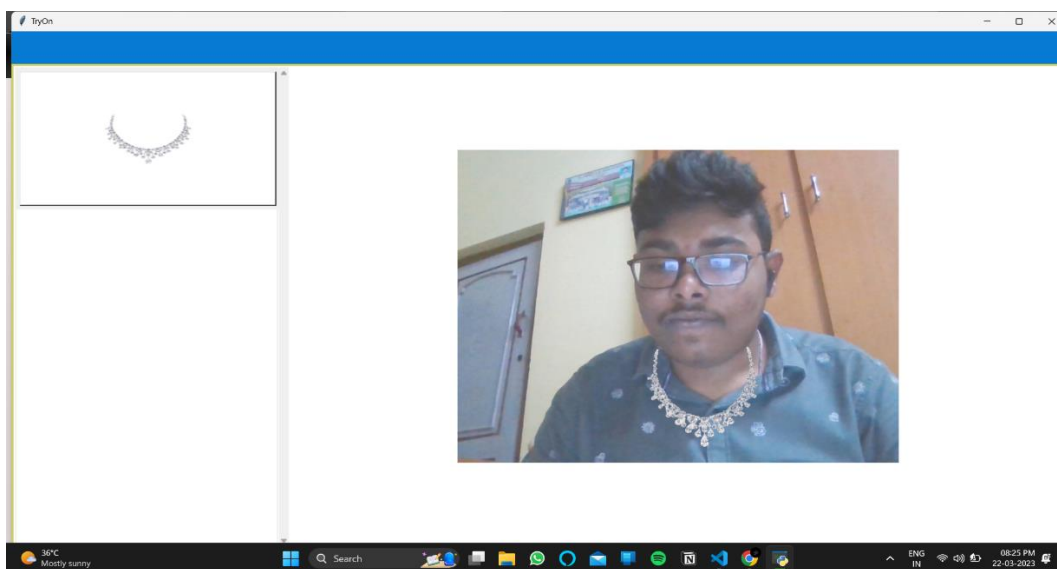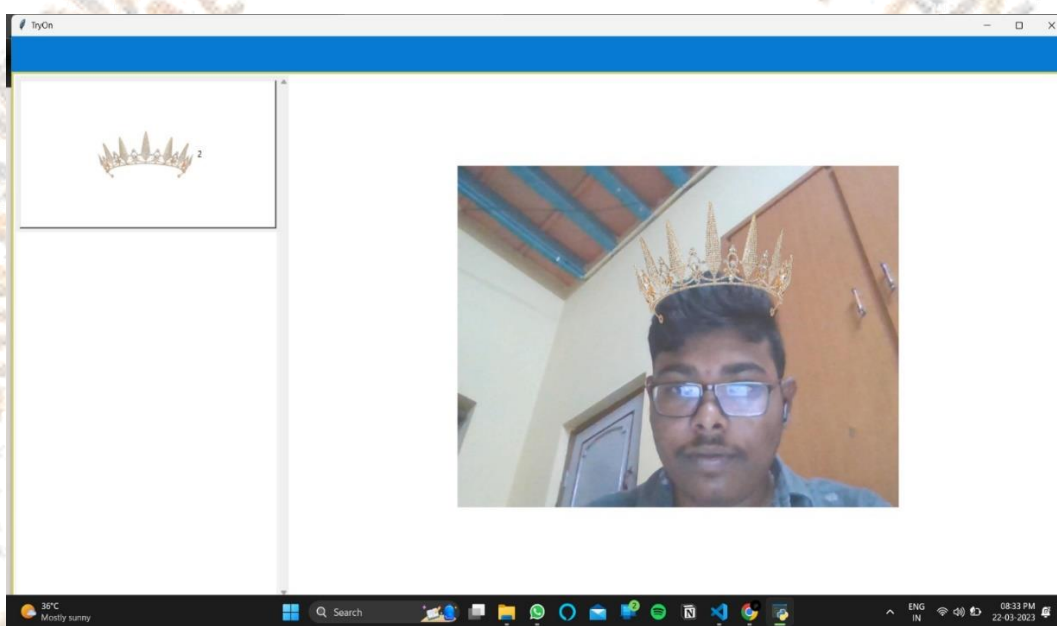
Fig.5 Output -1(User Trail preview)

Fig.6   Output -2 (User Trail preview)

The core functionality of the Virtual Trail Room lies in its ability to superimpose virtual outfits onto the user's image. During this phase, advanced computer vision techniques, including skin color detection, facial detection, and edge detection, are implemented. The output would be an execution of the Virtual Trail Room that accurately positions the selected outfit on the user's body, seamlessly blending it with their image .One important output of the implementation phase is the real-time visualization of the virtual outfit. The system should provide users with a live video feed that allows them to see themselves wearing the virtual outfit in real-time. This output ensures users can evaluate the fit, appearance, and overall look of the outfit from different angles, enhancing their virtual try-on experience.

IV. CONCLUSIONS

To sum up, the virtual trail room system is a key development in the security and surveillance industry. The system is able to detect and track human faces in the real time by employing cutting-edge computer vision technologies like the Haarcascade classifier and OpenCV. This allows for the cost-effective and efficient surveillance and tracking of people without the use of physical security staff.One crucial element that makes the system an indispensable tool for guaranteeing safety and security in the range of settings is its capacity to send out notifications in the event of aberrant behaviour or movement patterns. Rapid response times and enhanced the security procedures are made possible by this proactive approach to security. Additionally, the virtual trail room system's scalability

enables simple connection with extra cameras and sensors as needed, offering a flexible solution that can be adjusted to fit the requirements of a variety of locations.Overall, the virtual trail room system offers a very effective and efficient way to track and monitor people in real time, and it has the potential to completely change the security and surveillance industries. The system's ability to send out alerts in the event of aberrant behaviour or movement patterns makes it a crucial tool for guaranteeing safety and security in a range of contexts. It also uses powerful computer vision technologies and the Dlib for data management.

V. REFERENCES

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