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Virtual Try-ON Clothes

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Abstract: ***The increasing popularity of e-commerce and the desire for personalized shopping experiences have led to the development of virtual trial room applications. In this research paper, we present a novel approach to outfit prediction in a web-based virtual trial room. Our system utilizes machine learning techniques to analyze input images of shirts and pants and provides accurate outfit recommendations to users. The application, developed using Python, Flask, HTML, CSS, JavaScript, Bootstrap, and OpenCV, offers users the ability to virtually try on different outfits without physically trying them on. We discuss the design, implementation, and evaluation of our system, highlighting its effectiveness in accurately predicting outfit combinations and improving the user experience. Digital try-on systems for e-commerce have the potential to change people's lives and provide notable economic benefits.***
However, their development is limited by practicalconstraints, such as accurate sizing of the body andrealism of demonstrations. We enumerate three open challenges remaining for acomplete and easy-to-use try-on system that recent advances in machine learning make increasingly tractable. For each, we describe the problem, introduce state-of-the-art approaches, and provide future directions.

I. PROBLEM STATEMENT

E-commerce has grown at a rapid pace in recent years. Consumers today are more likely to shop online than to visit a retail store. The situation is much more complicated, however, when it comes to buying clothes. People need to know how a garment fits on them, how it looks, and how it feels.

II. INTRODUCTION

The emergence of virtual trial room applications has revolutionized the way people shop for clothes online. By enabling users to virtually try on different outfits, these applications bridge the gapbetween the online and offline shopping experience. In this paper, we present a machine learning-based approach to outfit prediction in a web-based virtual trial room, enhancing the accuracy and convenience of outfit selection for users.

Digital try-on systems for e- commerce have the potential to change people's lives and provide notable economic benefits. However, their development is limited by practical constraints, such as accurate sizing of the body and realism of demonstrations. We enumerate three open challenges remaining for a complete and easy-to-use try-on system that recent advances in machine learning make increasingly tractable. For each, we describe the problem, introduce state-of-the-art approaches, and provide future directions.

III. BLOCK DIAGRAM

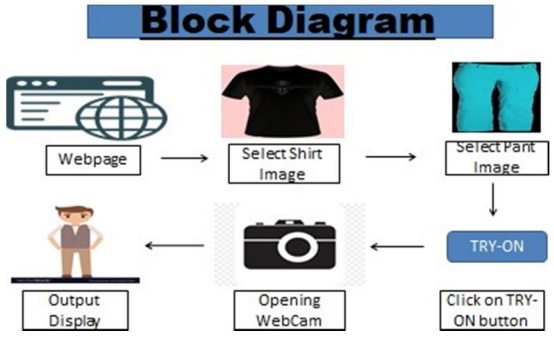

Fig -1:Block Diagram

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IV. SCOPE OF THE STUDY

The proposed system will facilitate to Customers can now virtually try on various types of products before purchasing them. order multiple variations of a single product. What's important here is that AR helps customers avoid disappointment and choose the best products for them. As a result, both online and brick and-mortar store return rates tend to fall. AP shortens the customer journey and increases store conversions regardless of whether the customer shops for items online or in-store. Use case diagrams describe the high-level functions and scope of the system, these diagrams alsoidentify the interactions between the system and its actors. A Use case diagram outlines how external entities user interact with an internal software system.

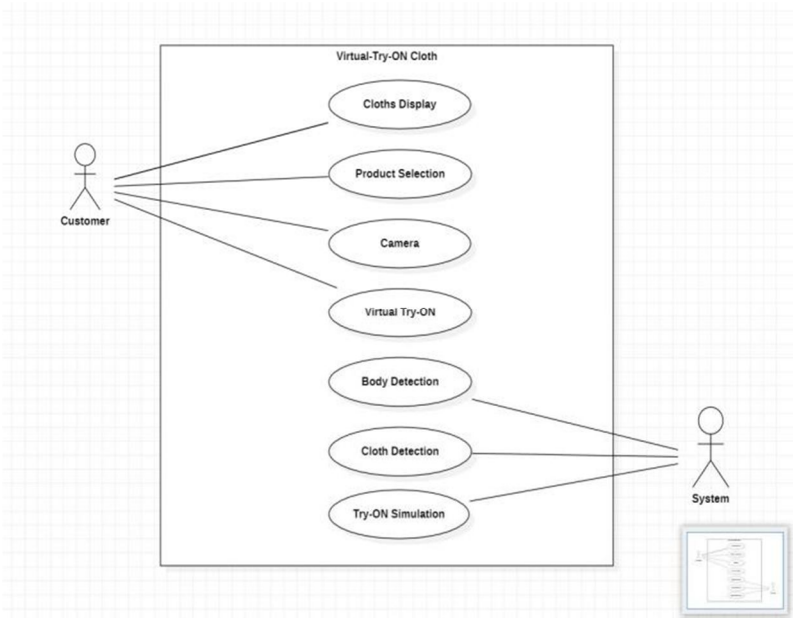

Fig -2:Use Case Diagram

A state diagram consists of states, transitions, activities, and events. It describes the different states that an object moves through or provide an abstract description of the behaviorof a system.

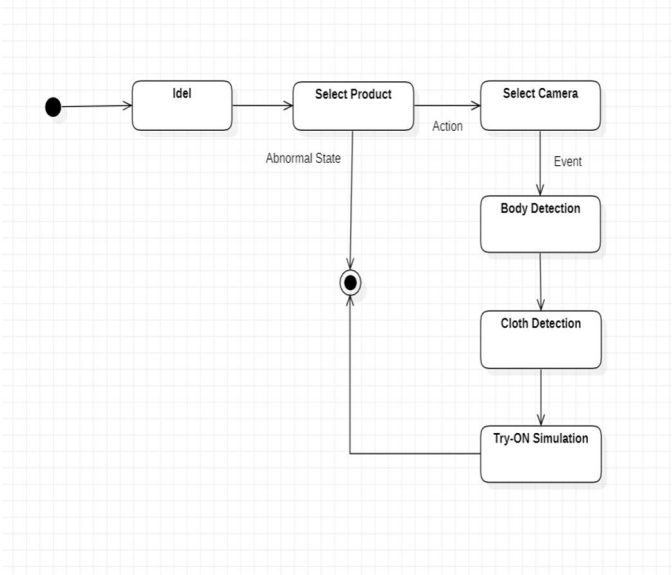

Fig -3: State Diagram

Activity diagrams are graphical representations of workflows with support for selection, repetition, and concurrency of step-by-step activities and tasks

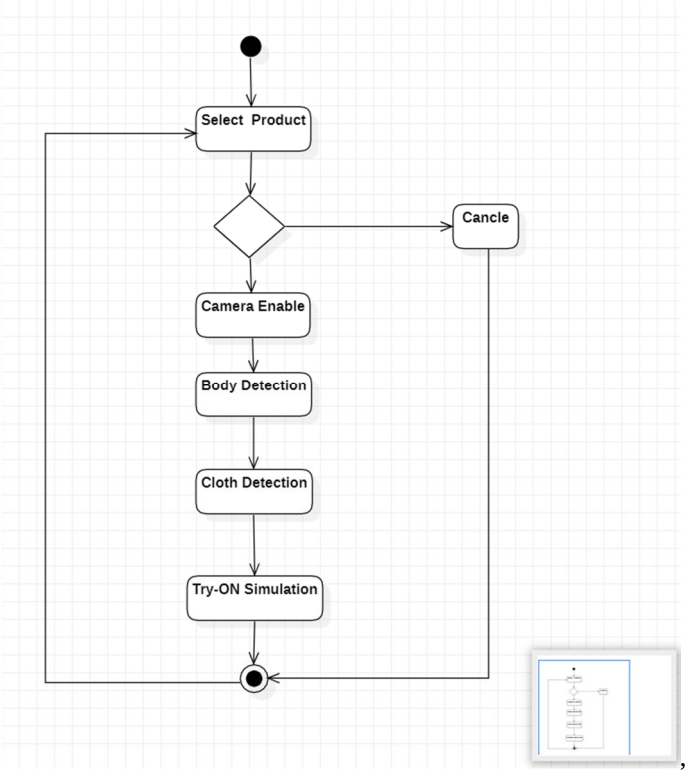

Fig -4: Activity Diagram

Sequence Diagrams are interaction diagrams that detail how operations are carried out. They capture the interaction between objects in the context of a collaboration. Sequence Diagrams are time focus and they show the order of the interaction visually by using the vertical axis of the diagram to represent time what messages are sent and when.

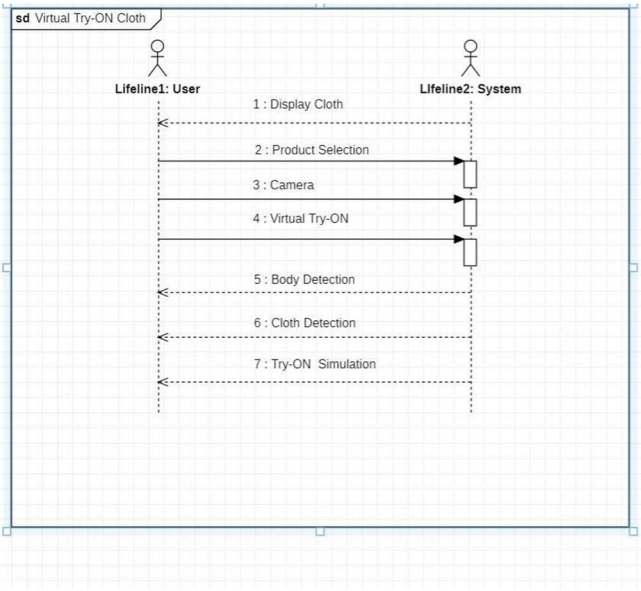

Fig -5: Sequence Diagram

V. RELATED WORK

We provide an overview of related research and existing virtual trial room systems. We discussthe advancements made in machine learning techniques for image analysis and outfit recommendation, highlighting theunique contributions of our approach.

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VI. ALGORITHM AND LIBRARY USED

A. *Haar Cascade Classifier Algorithm*

1) A machine Learning Algorithm used for object detection,particularly for detecting faces

2) The Haar Cascade Classifier algorithm works by using a set of Haar-like features & a cascade of waek claasifier trained with the ADAboost Algorithm.

3) It Evaluates these features at multiple sacles & positions within a sliding window framework , efficiently rejecting nonface regions early on.

4) The algorithm strength lies in the ability to quickly detectfaces in real time application.

Haar cascade is an algorithm that can detect objects in images, irrespective of their scale in image and location.

This algorithm is not so complex and can run in real-time. We can train a haar-cascade detector to detect various objects like cars, bikes, buildings, fruits, etc.

B. *OpenCV Library*

OpenCV is a Python library that allows you to perform image processing and computer vision tasks. It provides a wide range of features, including object detection, face recognition, and tracking.

OpenCV is an open-source software library for computer vision and machine learning. The OpenCV full form is Open Source Computer Vision Library. It was created to provide a shared infrastructure for applications for computer vision and to speed up the use of machine perception in consumer products. OpenCV, as a BSD- licensed software, makes it simple for companies to use and change the code. There are some predefined packagesand libraries that make our life simple and OpenCV is one of them.

VII. IMPLEMENTATION DETAILS

We provide detailed insights into the implementation of our virtual trial room system. This includes the front-end design and user interface considerations, back-end functionality integration, and the integration of the machine learning model within the application. We discuss the challenges encountered during implementation and the strategies employed to overcome them.

The Webpages for the project is developed with the frontend technologies like html an CSS which are used to create the user friendly interface and handle client site interactions. To give the extra look and feel to the website we use the bootstrap framework. Bootstrap library is use for responsive design and predefined styles. For the backend we use Python. We use an open source flask framework which is written in python. We use computer vision library which is open cv library use for image and video processing

A. Evaluation

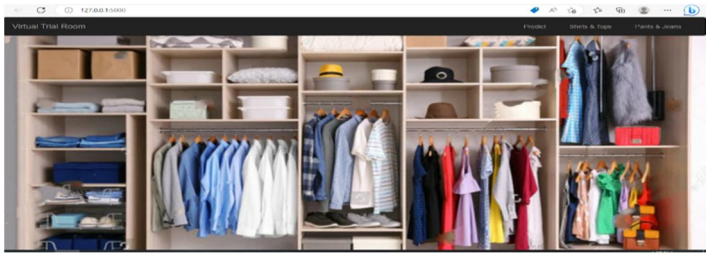
We present the evaluation methodology used to assess the performance of our system. We discuss the dataset used for training and testing, the evaluation metrics employed, and the experimental results obtained. The evaluation demonstrates the accuracy of outfit predictions and the overall effectiveness of the system.

B. *Input*

- Clothes Image
- Target body

VIII. RESULTS AND DISCUSSION

We present and analyze the results obtained from the evaluation, emphasizing the performance and usability of the virtual trial room system. We discuss the significance of accurate outfit predictions in improving the user experience and the potential impact on the e-commerce industry.



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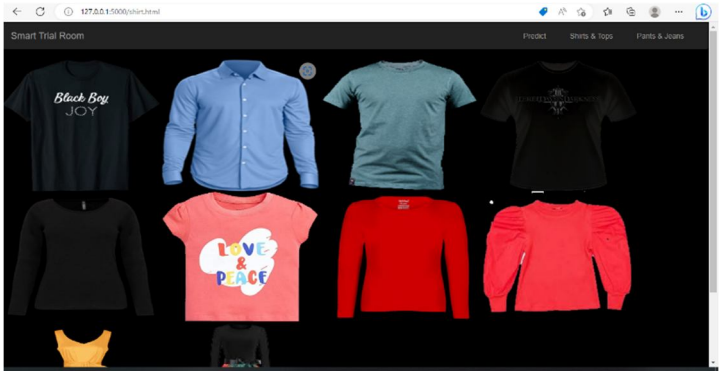
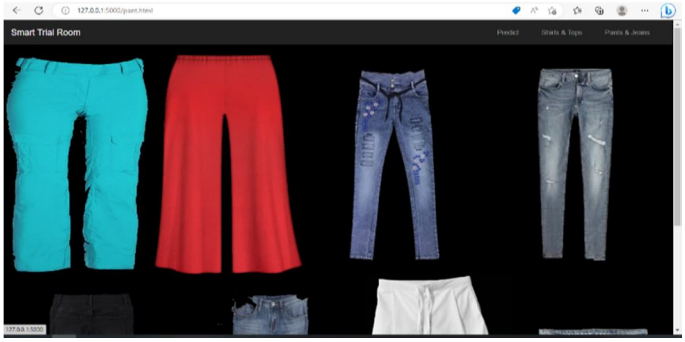
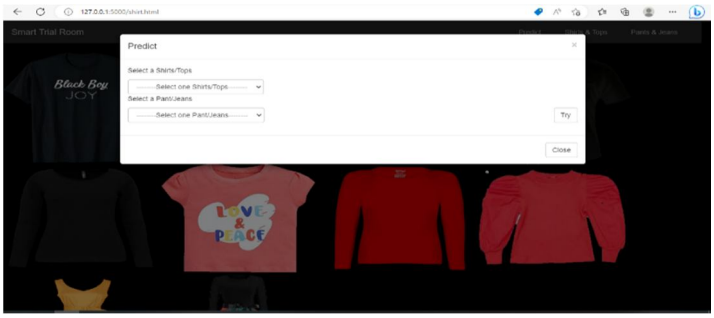


Shirts & Tops Images



Pants & Jeans Images



Selection of clothes images from the dropdown list

Final Output

IX. CONCLUSIONS

In this work we have been focusing on customer interface of the virtual dressing room. We will developing a3-D cloth scanner which would be interesting to test in usability and user experience study.

We summarize the key contributions of our research and discuss future directions for enhancing virtual trial room systems. We highlight the potential for incorporating additional features, such as personalized recommendations and augmented reality, to further improve the user experience. In this work we have been focusing on customer interface of the virtual dressing room. We will developing a 3-D cloth scanner which would be interesting to test in usability and user experience study.

X. FUTURE SCOPE

A. Adding more clothes option.
B. Integrating color customization.
C. Improving the accuracy of clothing alignment.
D. Encourage the audience to think about how this technology can be further develop and applied indifferent domains.

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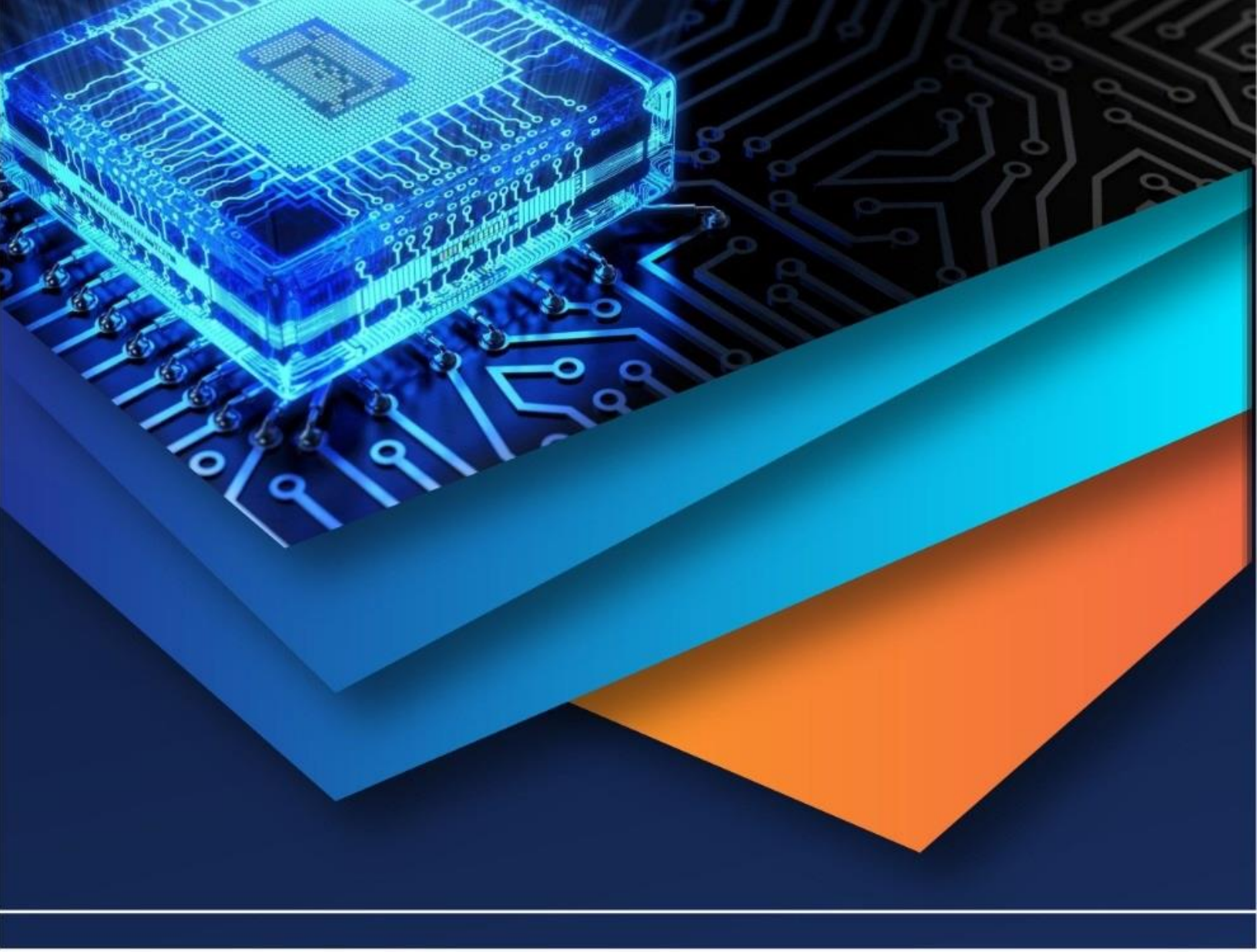

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