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Fabric-Aware AI Virtual Try-On System with Smart Garment Layerning and Multimodal Styling Feedback

1st S. Suka Shree
Department of advanced Computing Science
Vels Institute of Science, Technology & Advanced Studies
Chennai, India

2nd DR. R. Durga
Department of advanced Computing Science
Vels Institute of Science, Technology & Advanced Studies
Chennai, India

ABSTRACT-It may be difficult for an online fashion platform to provide better assistance to its users in choosing the most appropriate outfit. This project aims at Developing a Fabric-Aware AI Virtual Try-On System with Smart Garment Layering and Multimodal Styling Feedback to provide a better online experience to users in choosing the most appropriate outfit. This system helps the user upload an image, analyze the color tone, and provide the most appropriate dress color. This system considers external factors such as weather, location, and temperature to provide the most appropriate outfit. Moreover, an AI system helps provide intelligent recommendations by pairing clothes such as tops and bottoms. In addition, an AR-based motion try-on system provides a better experience for the user.

1. INTRODUCTION

It may be difficult for an online fashion platform to provide better assistance to its users in choosing the most appropriate outfit. This project aims at Developing a Fabric-Aware AI Virtual Try-On System with Smart Garment Layering and Multimodal Styling Feedback to provide a better online experience to users in choosing the most appropriate outfit. This system helps the user upload an image, analyze the color tone, and provide the most appropriate dress color. This system considers external factors such as weather, location, and temperature to provide the most appropriate outfit.
Moreover, an AI system helps provide intelligent recommendations by pairing clothes such as tops and bottoms. In addition, an AR-based motion try-on system provides a better experience for the user.

This project aims to develop a Fabric-Aware AI Virtual Try-On System with Smart Garment Layering and Multimodal Styling Feedback. The system allows users to upload their images, analyzes their skin tone, and suggests suitable dress colors and outfit combinations. It also considers weather, location, and temperature to recommend appropriate clothing. In addition, an AI stylist provides pairing suggestions, and an AR-based motion try-on feature enables users to visualize outfits in a more interactive way, improving the overall online shopping experience.

2. LITERATURE SURVEY

In recent years, many researchers have worked on enhancing the online fashion systems to provide easier shopping for the user. In the previous systems, dresses were displayed on models or mannequins, but it was not clear to the user how the dress would look on them personally. Therefore, difficulty was experienced in selecting the correct outfit.

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As seen from the existing systems, most systems are limited to a particular aspect. For instance, there are systems that are limited to try-on or recommendation. However, there is a need to create a system that includes all these aspects, such as try-on, smart outfit suggestions, and real-time aspects. This project seeks to address the challenge by incorporating all these aspects in one system to make it better and more useful to the user.

3. PROPOSED METHODALOGY

In this project, an AI-based technique is employed to build a virtual try-on system, which helps users get personalized outfit suggestions. This technique works by considering user images, environmental factors, and suggesting appropriate outfits. The primary objective of this project is to enhance the online shopping experience by making it more interactive.

A. Data Collection

The initial step in building a virtual try-on system is to collect user input data. For example, a user needs to upload a picture, and additional information such as location, weather, etc., may be taken into consideration. External factors like temperature and weather may be obtained.

B. Image Processing and Skin Tone Recognition Computer vision

methods are used to process the uploaded
image. The technology recognizes the picture of the face, and gathers an amount of information regarding its skin tone. This assists in suggests colors those compliments the user contour.

Formula (RGB Average Method):

Skin Tone Value = (R + G + B) / 3

C. Feature Extraction

For instance, features like skin tone, body structure and user preferences are extracted. We also use temperature and weather to help us make better recommendations.

D. Outfit Recommendation

Extracted features are then utilized to recommend suitable outfits. Based on color compatibility, occasion, and weather conditions, it matches clothing items with each other.

Formula (Similarity Score):

Similarity = Σ (User Feature ∗ Outfit Feature)

E. Smart Garment Layering

It will recommend combinations such as tops with jeans, tops with jackets, etc. according to compatibility. It guarantees selected outfits coordinate well within color, style and fabric.

F. AI Stylist Module

The AI stylist makes suggestions such as “This top matches well with this jean” or “This color suits your skin tone.” This module increases the confidence level of the users.

G. AR-Based Virtual Try-On

Augmented Reality is utilized to put the clothes on the image or video of the user. This allows the users to see the look of the outfit.

H. Model Evaluation

The performance of the system may be measured by the level of satisfaction and the accuracy of the recommendations.

Formula (Accuracy):

Accuracy = Correct Recommendations / Total Recommendations

Results:

Lastly, the system shows:

Recommendations for appropriate attire Suggestions for matching colors Combinations of styles AI stylist comments Virtual try-on outcomes

4. ARCHITECTURE DIAGRAM

5. INPUT

The inputs to the system are user-supplied data and environmental information. The user uploads an image through the website and that's the main input. This image is utilized when analyzing aspects like skin color and body type. Apart from capturing the image, it might also log user preferences, occasions, and style.

Moreover external data like location, weather type & temperature are also fed in as inputs using online sources or APIs. These factors allow the system to recommend appropriate outfits according to real world conditions

Behind all of these are the processing pipelines wherein, every input data is noted and converted in such form that can be easily utilized by system for suggesting recommendations etc.. Thereby, combining the user data with environmental data for generating designed outfits.

6. PSEUDOCODE

START

Upload user image

Capture user details (location, weather, occasion) Load clothing dataset

Preprocess image (resize, clean) Detect face and extract skin tone

Extract features (skin tone, body type, preferences) Get weather and temperature data

Match outfits based on features and conditions Apply color recommendation based on skin tone

Generate outfit combinations (top, bottom, layering) AI stylist suggests best matching outfits

Apply AR virtual try-on (image/video overlay) Display recommended outfits and try-on results END

7. OUTPUT

Fig1: Upload the photo

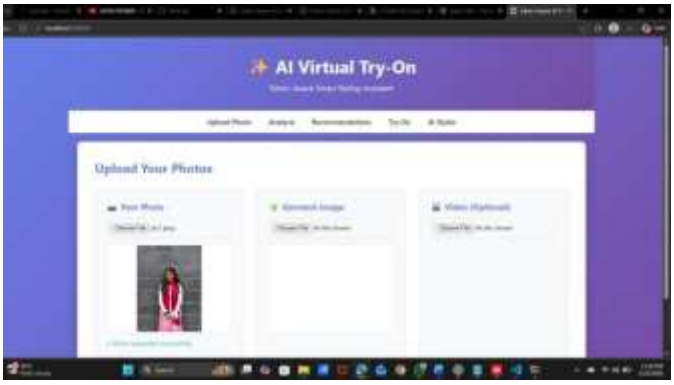
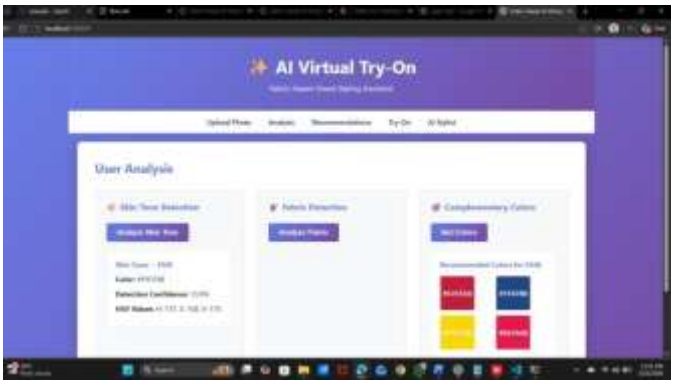


Fig 2: Analysis the Skin Tone



8. RESULT AND DISCUSSION

The AI Stylist module adds another dimension to the system by offering personalized feedback and styling recommendations. The system analyzes the user's body type, outfit selection, and color coordination to offer significant recommendations such as improving the fit, making better selections, and enhancing the look. The system also enables users to interact with the AI Stylist by asking queries and receiving instant responses.

Fig:3 Smart Recommendations:

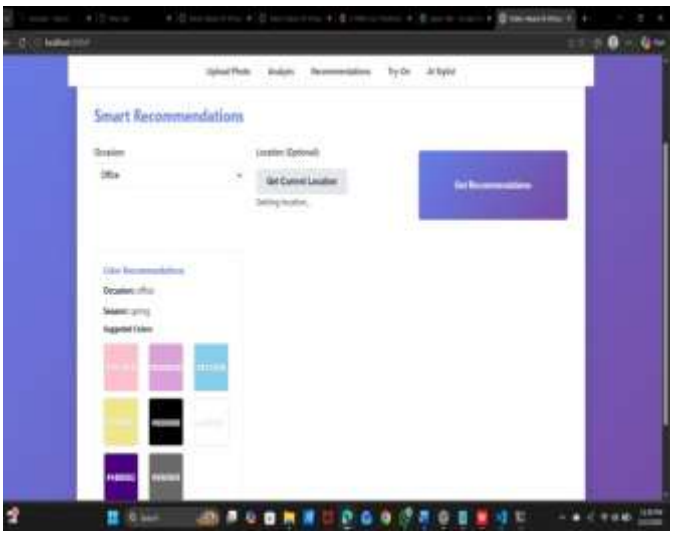


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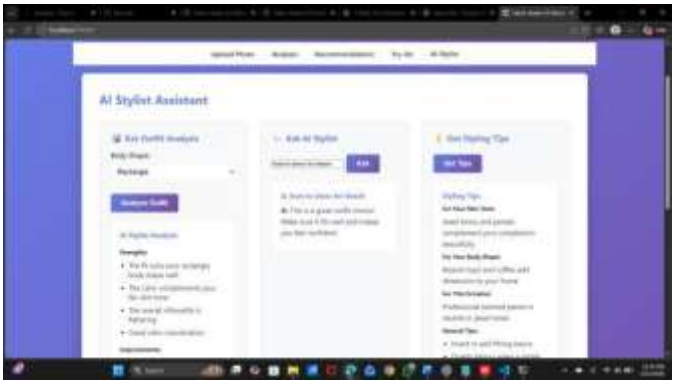
Fig:4 AI Stylist Assistant Suggestion



Overall, the results demonstrate that the system effectively combines image analysis, smart recommendations, and AI- based styling feedback. It provides a personalized and user- friendly experience, improving confidence in outfit selection and making online fashion interaction more intelligent and engaging.

9. CONCLUSION

This project focuses on creating a Fabric-Aware AI Virtual Try-On System with Smart Garment Layering and Multimodal Styling Feedback to improve the online fashion experience. The system processes images to analyze the user's skin tone and provide recommendations for colors. It also takes into account the occasion, weather, and location to provide recommendations for the appropriate outfit for a given event or situation.

The inclusion of the AI Stylist module enables the user to benefit from personalized styling recommendations. It also provides recommendations for improving the outfit and combining the garments. In addition, the system provides styling tips for the user, which are helpful in making decisions. This also increases the user experience. The inclusion of the AR-based Virtual Try-On feature enables the system to be more engaging for the user. The user can try on the outfit virtually and determine how it looks. This reduces the chances of confusion for the user and increases their confidence in choosing the outfit while shopping online. Thus, the project is a success in incorporating artificial intelligence and computer vision to provide a smart and personalized experience for the user.

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