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Research Paper

AI FASHION STYLIST (UPLOAD PHOTO - OUTFIT SUGGESTIONS)

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Abstract

The AI Fashion Stylist is an Artificial Intelligence-based fashion recommendation system that helps users select suitable outfits by analyzing an uploaded photograph and understanding their clothing preferences. Choosing an appropriate outfit can sometimes be difficult because users need to consider clothing combinations, colors, occasions, styles, and current fashion trends. The proposed system uses AI to simplify this process and provide personalized outfit suggestions.

The system allows users to upload a photograph and provide optional information such as the occasion, preferred style, color preferences, budget range, and clothing category. Computer Vision techniques analyze the photograph to identify visible clothing items, colors, patterns, and general garment characteristics. The system does not need to identify sensitive personal characteristics and focuses primarily on clothing and fashion-related information.

After analyzing the input, the recommendation engine generates suitable outfit combinations. For example, the system can suggest combinations for casual outings, college, office environments, parties, travel, weddings, or other occasions. It can recommend tops, bottoms, footwear, accessories, and complementary colors. The suggestions can be adjusted according to the user's selected style and preferences.

The system can also provide explanations for its recommendations. It may explain why particular colors or clothing combinations work well together and provide alternative outfit options. Users can save their favorite recommendations, provide feedback, and request different suggestions. The feedback can be used to improve future recommendations and make the experience more personalized.

Overall, the AI Fashion Stylist provides a convenient and interactive approach to fashion recommendation. It can be useful for students, professionals, online shoppers, fashion enthusiasts, and users who want assistance in selecting outfits. Future enhancements can include virtual try-on, real-time camera support, wardrobe management, shopping integration, trend analysis, multilingual interaction, and personalized outfit generation.

I. INTRODUCTION

Fashion plays an important role in everyday life, and selecting suitable clothing can depend on factors such as occasion, personal preferences, color combinations, comfort, and current trends. Many people spend considerable time deciding what to wear for different situations. Users may also purchase individual clothing items without knowing how to combine them with the rest of their wardrobe. An intelligent fashion recommendation system can help simplify these decisions.

Traditional fashion selection usually depends on personal experience, fashion magazines, social media, friends, or professional stylists. While these methods can provide useful ideas, they may not always provide recommendations that match an individual's available clothing or preferences. Professional styling services may also be expensive or unavailable when users need quick suggestions.

Advances in Computer Vision and Artificial Intelligence have made it possible for systems to analyze images and identify visual characteristics of objects. In fashion applications, computer vision can be used to recognize clothing categories, colors, patterns, and garment characteristics. Combining image analysis with recommendation algorithms allows an application to generate outfit combinations based on the clothing visible in a user's photograph.

The AI Fashion Stylist allows users to upload a photograph and receive AI-generated outfit suggestions. The system analyzes the visible clothing and combines this information with optional user preferences such as occasion, style, favorite colors, and budget. A recommendation engine then selects or generates outfit combinations that are relevant to the user's requirements.

The proposed system aims to make fashion selection easier, faster, and more personalized. Instead of searching through many fashion websites or asking different people for suggestions, users can interact with one AI-based stylist. The system can provide multiple alternatives and allow users to refine recommendations according to their preferences.

II. LITERATURE SURVEY

Traditional fashion recommendation systems have mainly relied on product catalogs, predefined categories, user ratings, and manually created fashion rules. E-commerce platforms commonly recommend products based on browsing history, purchases, and similar user behavior. These systems are useful for product discovery but may not fully understand how different clothing items should be combined into a complete outfit.

Computer Vision research has introduced techniques for recognizing clothing items from images. Image classification, object detection, and image segmentation can identify garments such as shirts, trousers, dresses, jackets, shoes, and accessories. These techniques provide the foundation for analyzing photographs uploaded by users. However, identifying individual garments alone does not guarantee that the recommended items will form a visually suitable outfit.

Fashion recommendation research has also explored color analysis, visual similarity, style recognition, and compatibility prediction. Deep learning models can learn visual relationships between clothing items and predict whether two or more garments are

likely to work well together. Such methods can improve outfit recommendations compared with simple category-based matching.

Recommendation systems have increasingly incorporated user preferences and behavioral information. Content-based filtering can recommend items based on garment characteristics, while collaborative filtering can use preferences from similar users. Hybrid recommendation approaches combine multiple sources of information to improve personalization. However, recommendations can become less effective when limited information is available about a new user.

Recent developments in Generative AI and multimodal models have created new possibilities for fashion applications. AI models can analyze images and natural-language preferences together and generate detailed outfit descriptions and styling suggestions. Generative systems can also suggest alternative combinations based on occasion, color preferences, and style requirements. However, generated recommendations should be treated as suggestions rather than objective judgments, since fashion preferences are highly subjective.

Existing research demonstrates that combining Computer Vision, fashion compatibility models, recommendation algorithms, and Generative AI can create powerful personalized styling systems. Challenges remain in accurately recognizing garments, understanding user preferences, handling different lighting and image conditions, and generating practical recommendations. The proposed **AI Fashion Stylist** integrates image analysis, clothing recognition, preference processing, outfit compatibility analysis, and AI-based recommendation into a single user-friendly system.

III. SYSTEM ANALYSIS

The **AI Fashion Stylist** is designed to provide personalized outfit suggestions from an uploaded photograph. The user first uploads an image and optionally selects an occasion, preferred style, color preference, and other requirements. The image-processing module validates the photograph and prepares it for analysis. Computer Vision techniques identify visible clothing items, garment categories, colors, patterns, and other fashion-related characteristics. A clothing segmentation module separates relevant garments from the surrounding image when required. The user-preference module combines image information with the preferences provided by the user. An outfit compatibility engine evaluates possible combinations of clothing items. The recommendation engine generates several suitable outfit suggestions based on the selected requirements. A Generative AI module can provide natural-language styling explanations and alternative combinations. The system can also recommend complementary footwear and accessories. Users can rate, save, reject, or modify recommendations according to their preferences. The feedback module records relevant interactions to improve future recommendations. Finally, the personalized dashboard displays the recommended outfits and allows users to explore alternative styling options.

Existing System

Existing fashion recommendation systems are commonly available through e-commerce websites, fashion applications, social media platforms, and online styling services. E-commerce systems generally recommend individual products based on

browsing history, previous purchases, or similar products. Some platforms allow users to search for clothing using categories, colors, brands, and price ranges. However, users may still need to manually determine which products work well together. Traditional styling applications may provide predefined outfit combinations or trend-based recommendations. These recommendations may not consider the clothing already available to the user. Image-based fashion systems can identify garments but may provide limited personalized styling advice. Some systems also require users to manually select clothing attributes. Recommendations may not change significantly according to occasion or individual preferences. Professional fashion stylists can provide personalized assistance but may not be affordable or available to everyone. Therefore, existing approaches often lack a single intelligent system that combines uploaded-image analysis, user preferences, outfit compatibility, and conversational styling assistance.

Disadvantages of Existing System

- Limited personalization of outfit recommendations.
- Users may need to manually search for clothing items.
- Many systems recommend individual products rather than complete outfits.
- Limited understanding of clothing already owned by the user.
- Image analysis may be restricted to basic garment recognition.
- Recommendations may not consider the user's selected occasion.
- Limited combination of colors, footwear, and accessories.
- Traditional systems may depend heavily on predefined fashion rules.
- Limited conversational interaction for refining recommendations.
- Professional styling services may be expensive.
- Recommendations may not adapt quickly to user feedback.
- Limited support for generating multiple personalized alternatives.

Proposed System

The proposed **AI Fashion Stylist** uses Computer Vision, Artificial Intelligence, and recommendation techniques to generate personalized outfit suggestions from an uploaded photograph. The user uploads an image and can optionally specify the occasion, preferred style, color choices, and other fashion requirements. The image-analysis module identifies visible garments and extracts relevant clothing characteristics such as category, color, pattern, and style attributes. A segmentation component can isolate clothing regions for more accurate analysis. The preference-processing module combines image information with the user's selected requirements. An outfit compatibility engine evaluates combinations based on visual compatibility and the user's preferences. The recommendation engine generates multiple outfit options rather than a single result. Generative AI provides simple explanations for the suggested combinations and can create alternative styling ideas. The system can recommend complementary footwear and accessories when requested. Users can provide feedback by liking, rejecting, saving, or modifying recommendations. The system uses this feedback to improve future suggestions while respecting user preferences. The final dashboard presents personalized outfits in an easy-to-understand format.

Advantages of Proposed System

- Generates personalized outfit suggestions from uploaded photos.
- Automatically identifies visible clothing items.
- Considers colors, patterns, and garment categories.
- Supports occasion-based outfit recommendations.
- Provides multiple outfit combinations.
- Can recommend footwear and accessories.
- Combines image analysis with user preferences.
- Provides AI-generated styling explanations.
- Allows users to refine recommendations.
- Learns from relevant user feedback and preferences.
- Saves time compared with manual outfit selection.
- Provides convenient virtual styling assistance.

IV. METHODOLOGY

The methodology begins when the user uploads a photograph through the AI Fashion Stylist interface. The system first validates the image and performs preprocessing such as resizing and quality normalization. A Computer Vision module analyzes the image to identify visible clothing items and relevant garment characteristics. Image segmentation can be used to separate clothing regions from the background when necessary. The system extracts attributes such as clothing category, dominant colors, patterns, and general style features. The user can additionally provide preferences such as occasion, preferred style, color choices, and budget. A preference-analysis module combines the image features with the user requirements. The outfit compatibility engine evaluates possible combinations of garments based on visual and contextual compatibility. The recommendation engine generates several outfit combinations that match the selected requirements. A Generative AI module provides styling explanations and alternative suggestions in natural language. Users can rate or modify the recommended outfits and provide feedback. Finally, the system updates relevant preference information and displays the selected recommendations through a personalized fashion dashboard.

SYSTEM ARCHITECTURE

The AI Fashion Stylist consists of several interconnected modules that work together to analyze clothing photographs and generate personalized outfit recommendations. The User Interface allows users to upload photographs and specify preferences such as occasion, style, and color. The Image Processing Module validates, resizes, and prepares the uploaded image. The Computer Vision Module detects visible clothing items and extracts fashion-related features. The Clothing Segmentation Module isolates garments when detailed analysis is required. The Fashion Feature Extraction Module identifies categories, colors, patterns, and style attributes. The User Preference Module processes the user's selected requirements and preferences. The Fashion Knowledge Base stores clothing categories, color relationships, style rules, and outfit compatibility information. The Outfit Compatibility Engine evaluates possible clothing combinations. The AI Recommendation Engine generates personalized outfit suggestions. The Generative AI Module provides styling explanations and alternative combinations. The Feedback and Personalization Module learns from user interactions and preferences. Finally, the Fashion Dashboard displays recommended outfits, styling explanations, saved combinations, and alternative suggestions.



V. RESULT AND OUTPUT

AI Fashion Stylist
Your Personal AI Stylist

"Same You Better Outfits"

Upload | Get Outfit Suggestions | Look Confident Everyday

1. Upload Your Photo

Upload a clear photo to get personalized outfit suggestions.

Change Photo

Next →

2. Image Analysis Result

Our AI analyzes your photo and detects clothing items, colors and style.

Detected Items

- Top:** Black Top (Casual, Solid)
- Bottom:** Blue Jeans (Denim, Wide Leg)
- Footwear:** White Sneakers (Casual)
- Accessories:** Black Handbag (Optional)

Dominant Colors

Style Analysis

Casual | Minimal | Trendy | Comfortable

3. Outfit Suggestions (Results)

Here are some outfits curated for you based on your photo and preferences.

AI | Casual | College | Office | Party | Traditional

Casual Look

Simple, comfortable and stylish.

View Details

Office Look

Professional and elegant.

View Details

Party Look

Trendy and eye-catching.

View Details

4. Detailed Output

Get a closer look at the recommended outfit.

Casual Look

Why this outfit?

- ✓ Matches your current style
- ✓ Looks good for everyday wear
- ✓ Comfortable and trendy
- ✓ Neutral colors go well together

Similar Products

- Wide Leg Jeans ₹1,299
- Black Top ₹799
- Shoulder Bag ₹2,499
- White Sneakers ₹2,199

Save Outfit | Shop Similar Items

5. More Outfit Variations

Explore different combinations for various occasions.

College | Office | Party | Date | Travel

Chic College Look

Layered Look

Sporty Look

6. Virtual Try-On (Preview)

See how the outfit looks on you (AI generated).

Casual Look

Office Look

Party Look

Note: This is an AI-generated preview and may not be 100% accurate.

7. AI Styling Assistant

Ask for more suggestions or customize your outfit.

Suggest an outfit for a college event

Here's a trendy and comfortable outfit for a college event!

Can you suggest something in black?

Sure! Here's a stylish all-black outfit for a college event.

Type your request here...

AI Powered Personalized Outfit Suggestions | Style for Every Occasion Casual | Office | Party | Travel | Look Good Feel Confident | Your Style, Our Intelligence Dress Smarter with AI | "Fashion made simple with AI"

VI. CONCLUSION

The AI Fashion Stylist provides an intelligent and convenient solution for helping users select suitable outfits based on an uploaded photograph and their personal preferences.

The system reduces the time and effort required to manually search for clothing combinations and styling ideas.

By combining Computer Vision, Artificial Intelligence, image analysis, and recommendation techniques, the system can identify visible clothing items, colors, patterns, and general style characteristics. It then uses this information along with user preferences such as occasion, preferred style, and color choices to generate suitable outfit combinations.

The system also provides multiple recommendations, styling explanations, accessory suggestions, and alternative outfit options. Users can interact with the recommendations by saving, rating, or requesting different combinations. This feedback can help the system provide more personalized suggestions over time.

Overall, the AI Fashion Stylist makes fashion selection faster, easier, personalized, and interactive. It can be useful for students, professionals, online shoppers, and fashion enthusiasts. Future enhancements can include virtual try-on, real-time camera analysis, personalized wardrobe management, shopping integration, fashion trend analysis, voice interaction, and more advanced AI-generated outfit visualization.

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