Fit Check

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Abstract

Fit Check is a next-generation digital fashion platform that leverages artificial intelligence, virtual try-on technology, and social engagement to transform users' styling experiences. The platform allows users to generate hyper-realistic AI avatars mirroring their physical appearance, enabling virtual experimentation with outfits without the need for physical trials. Integrated digital wardrobe management empowers users to organize, upload, and maintain their clothing, footwear, and accessories. By combining wardrobe curation with AI-driven outfit recommendations, the system offers personalized, practical, and interactive fashion guidance. Users can mix and match garments, explore style suggestions for various occasions, and confidently experiment with new looks. Additionally, social features promote sharing, collaboration, and peer feedback through ratings and comments. With real-time responsiveness, scalability, and robust data security, Fit Check establishes an engaging and future-ready fashion ecosystem.

Keywords: *Artificial intelligence in fashion, virtual try-on, AI avatars, digital wardrobe management, outfit recommendation system, personalized styling, fashion technology, social fashion platform, virtual styling experience.*

Introduction

In the contemporary digital era, fashion has evolved beyond a basic necessity into a powerful medium of self-expression, identity, and social communication. With the rapid growth of online platforms and social media, individuals are increasingly influenced by digital content, including trends promoted by influencers, brands, and communities. These platforms have significantly transformed how people discover, evaluate, and adopt fashion styles. However, despite the abundance of inspiration available online, most existing fashion applications primarily function as visual catalogs that showcase curated outfits, seasonal trends, and styling ideas, offering limited interaction and personalization.

One of the major challenges faced by users is the inability to visualize how a particular outfit would look on their own body type, skin tone, and overall appearance. This limitation often leads to uncertainty in decision-making and reduces user confidence when experimenting with new styles.

Furthermore, existing platforms do not provide effective tools for managing personal wardrobes. Users often struggle to organize their clothing items, keep track of available outfits, or efficiently combine different garments for various occasions. As a result, the gap between inspiration and practical implementation remains largely unaddressed.

To overcome these challenges, Fit Check introduces an innovative and integrated approach by combining artificial intelligence, virtual try-on technology, and social collaboration into a unified, user-centric platform. The system leverages advanced AI techniques to generate hyper-realistic avatars that closely replicate the user's physical attributes, enabling accurate and immersive virtual outfit trials. This feature allows users to experiment with different clothing combinations in a risk-free digital environment, thereby enhancing creativity and confidence in styling decisions.

In addition to virtual try-on capabilities, the platform incorporates a digital wardrobe management system that allows users to upload, categorize, and maintain their clothing, footwear, and accessories in an organized manner. This feature bridges the gap between digital inspiration and real-world wardrobe utilization, enabling users to make practical and informed styling choices. Moreover, Fit Check enhances personalization by integrating AI-driven outfit recommendation systems that analyze user preferences, occasions, and wardrobe availability to suggest suitable combinations.

Another significant aspect of the platform is its emphasis on social engagement and collaboration. Users can share their outfit choices, seek feedback from peers, participate in style discussions, and explore community-driven trends. This interactive environment fosters creativity, encourages experimentation, and builds a sense of community among users with shared fashion interests.

Overall, Fit Check represents a paradigm shift from passive fashion browsing to an interactive, intelligent, and personalized styling ecosystem. By seamlessly integrating advanced technologies with user-centric design, the platform aims to redefine the digital fashion experience, making it more practical, engaging, and accessible for modern users.

Scope

The primary aim of this project is to develop a comprehensive digital fashion ecosystem that

integrates personalized styling, virtual try-on capabilities, and social interaction. The system enables users to create realistic AI avatars that resemble their physical appearance while providing a digital wardrobe for efficient organization and management of clothing items, footwear, and accessories. It offers AI-driven outfit recommendations based on user preferences, occasions, and styles, facilitating experimentation with new outfit combinations. Furthermore, the platform supports social interactions by allowing users to share outfits, collaborate with peers, and receive feedback. Overall, the project combines technology, fashion, and social connectivity to deliver an interactive and practical styling experience.

Existing Systems and Limitations

Current fashion platforms primarily focus on showcasing fashion content curated by brands and influencers, enabling users to explore trends and styling ideas. However, these systems are largely limited to visual inspiration and lack interactive features. Users cannot virtually try on outfits or integrate their real wardrobe into the platform, making these applications passive rather than practical tools. Additionally, existing systems offer limited personalization, as they are not connected to users' preferences or clothing collections. They do not provide realistic avatars for visualization, lack wardrobe management features, and offer minimal social interaction beyond basic likes and comments. Moreover, the absence of AI assistance forces users to manually browse for outfit ideas without receiving personalized recommendations.

Proposed System and Advantages

The proposed Fit Check platform introduces an integrated solution that overcomes the limitations of existing systems by combining AI, virtual try-on, and social interaction features. Users can generate hyper-realistic avatars that accurately represent their physical appearance, enabling realistic outfit visualization. The digital wardrobe allows users to upload and categorize clothing items, while the virtual try-on feature enables mixing and matching of outfits. AI-driven recommendations provide personalized styling suggestions based on user preferences and occasions. Social collaboration features further enhance engagement by allowing users to share outfits, interact with friends, and exchange feedback. This integrated approach transforms fashion applications into practical, interactive, and personalized styling tools.

Functional Requirements

The system provides essential functionalities for both users and administrators. Users can register and log in securely, manage their digital wardrobe, generate AI avatars, interact with a virtual styling assistant, and engage in social activities such as sharing outfits and providing feedback. They can also securely log out of the platform. Administrators are responsible for managing user accounts, monitoring system activities, maintaining platform performance, and ensuring smooth operation through secure login and logout mechanisms.

Non-Functional Requirements

The system is designed to meet several quality attributes, including high performance with real-time avatar rendering and minimal latency, user-friendly interfaces for ease of use, and scalability to support a large number of users. Security is ensured through data encryption and robust authentication mechanisms. The platform is portable across multiple devices, including desktops, mobiles, and tablets, and is designed for maintainability to support future enhancements and updates.

Software and Hardware Requirements

The system operates on Windows 11 and is developed using Visual Studio Code. Frontend technologies include HTML, CSS, and JavaScript, with Three.js used for 3D rendering and Web APIs for backend integration. Hardware requirements include a minimum Intel i3 processor, 8 GB RAM, and 256 GB SSD storage to ensure efficient performance.

Software Development Life Cycle

The development of the Fit Check platform follows the Waterfall model, a sequential approach that ensures systematic progress through distinct phases. These phases include requirement gathering and analysis, system design, implementation, integration and testing, and final validation. This structured methodology ensures thorough testing and reliable system development.

System Design and Architecture

The system design emphasizes modularity, scalability, and efficiency, ensuring smooth rendering, responsive controls, and seamless interactions. The architecture includes both software and technical components. The software architecture defines core modules such as AI avatar generation, wardrobe management, virtual try-on, and social interaction features, while the technical architecture focuses on hardware infrastructure, server configurations, and network components required for system execution.

UML Diagrams

UML diagrams are used to visually represent system structure and interactions. Use case diagrams illustrate interactions between users and the system, class diagrams define system components and relationships, and sequence diagrams depict

dynamic interactions over time, including user actions and system responses.

System Implementation

The implementation phase transforms design into a functional system by integrating frontend interfaces, backend logic, and AI modules. The system adopts a modular architecture to ensure scalability and maintainability, while real-time AI processing enables seamless avatar generation and outfit visualization.

Software Testing

Software testing ensures system reliability, performance, and security. It involves verifying functionality, identifying defects, and improving quality. Testing is conducted across multiple levels, including unit testing for individual components, integration testing for module interactions, system testing for overall functionality, and acceptance testing to validate user requirements. Various testing types, such as functional, usability, performance, black-box, and regression testing, are employed to ensure robustness and reliability of the system.
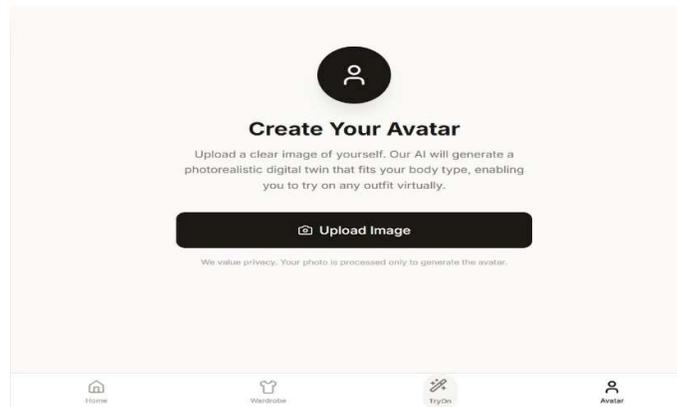
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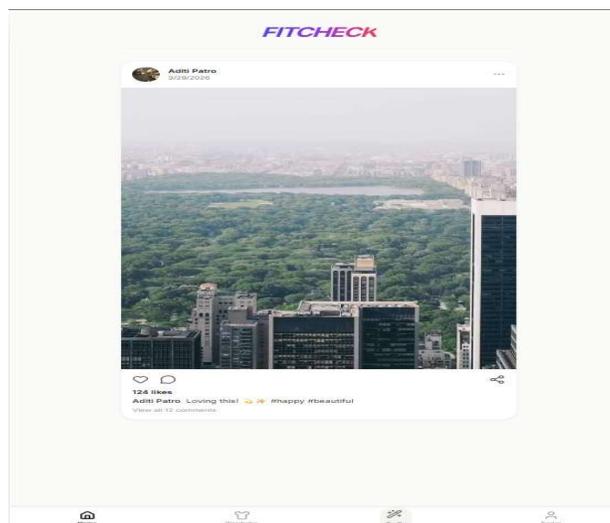
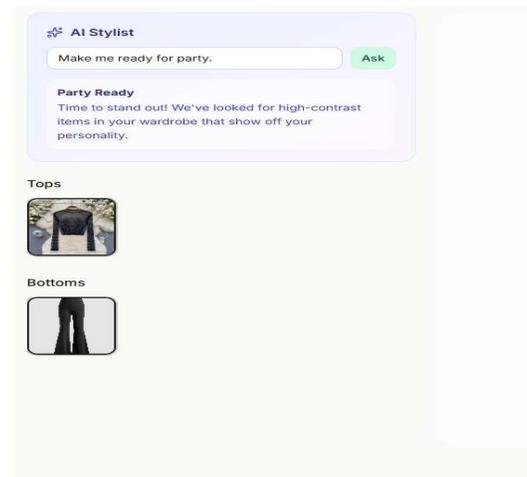**Screenshot 1 Social Feed Interface**
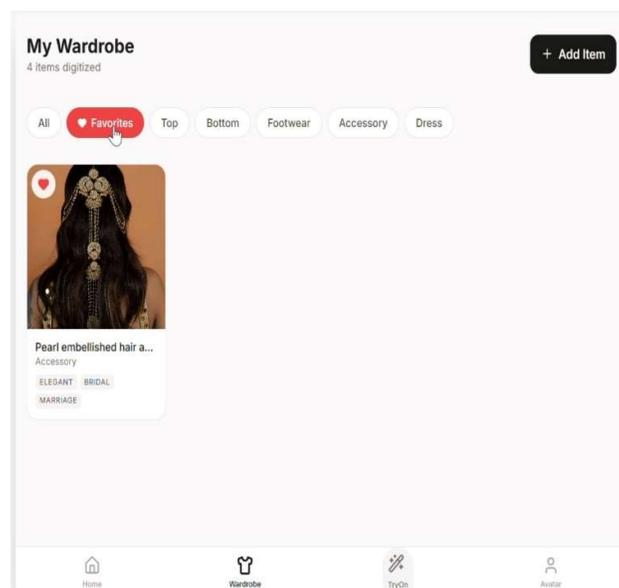
Screenshot 2 Favorites Filter in Wardrobe

Screenshot 3 AI-Based Outfit Simulation View

Screenshot 4 AI Digital Avatar Generation Module

Screenshot 5 AI Stylist Recommendation Interface

Conclusion

The *Fit Check* platform successfully integrates artificial intelligence, virtual try-on technology, and social interaction to provide a personalized and engaging digital wardrobe experience. By enabling users to create hyper-realistic avatars, perform

virtual outfit trials, receive AI-driven styling suggestions, and interact with friends through social features, the system enhances convenience, creativity, and confidence in fashion choices. The platform effectively bridges the gap between traditional fashion inspiration and practical wardrobe management, delivering an innovative solution that is both entertaining and functional.

Future Scope

Future enhancements of *Fit Check* can significantly expand its capabilities and user experience:

1. **Advanced AI Personalization:** Incorporating deeper learning models to generate outfit suggestions based on user preferences, mood, occasions, and trending fashion patterns.
2. **AR/VR Integration:** Enabling real-time virtual try-ons in augmented or virtual reality for immersive fashion visualization.
3. **E-Commerce Connectivity:** Linking with online retail platforms such as Amazon or Flipkart to allow direct purchase of recommended items from within the platform.
4. **Enhanced Social Features:** Facilitating real-time sharing of outfits, collaborative styling with friends, community voting, and feedback mechanisms to encourage engagement.
5. **Gamification and Rewards:** Introducing challenges, achievements, and style competitions to increase user interaction and retention.
6. **Cross-Platform Accessibility:** Expanding support to mobile apps and wearable devices to provide seamless access across multiple devices.

By incorporating these enhancements, the platform can evolve into a fully interactive, AI-driven fashion ecosystem that combines personalized styling, virtual experiences, and social connectivity.

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