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AI Online Fitting Room

Assessment in Creative Computing.

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AI Online Fitting Room

Introduction:

The incorporation of an online artificial intelligence (AI) fitting room signifies a notable progression within the domain of e-commerce, presenting advantages for both customers and enterprises. By scanning their bodies with a live camera, this novel idea enables users to virtually try on apparel items, eliminating the need for in-person measurements and decreasing the probability of product returns. The advent of this technology possesses tremendous potential to bring about a paradigm shift in the apparel sector and elevate the overall purchasing experience.

Significance of the Apparel Industry:

The apparel industry is of significant importance to economies on a global scale, as it generates employment opportunities and revenue. The proliferation of textile retailers, both brick-and-mortar and virtual, has been accompanied by an overall rise in consumer demand. Significantly, practical applications of augmented reality technology to improve the purchasing experience and stimulate customer participation have been illustrated through endeavours like the pop-up store established by the Chinese womenswear brand Lily (S. W. P. N. M. et al., 2021).

Technical Requirements and Challenges:

Implementing an online AI fitting room necessitates a wide array of technical competencies and tools, such as Html5, CSS, Js, Stripe API, Google Cloud API, AWS Rekognition, Three.js, JQuery, and Posenet. The implementation of critical functionalities, including user authentication, machine learning-driven body tracking, live camera integration, and secure payment processing, requires the utilisation of these technologies. Because building the software requires a wide range of skills and knowledge, this project can be completed by September. The app can currently provide visual and basic functionality such as browsing the app, camera integration to start and stop live, shopping page, bag page with payment method, Sign Up page and home page.

- This project needs to write server-side code to manage user authentication and storage. Data and process requests. Create databases to hold purchase information, inventory of clothing, and user information.

- To safely register users, control login/logout sessions, and handle password recovery, put in place a strong authentication system.
- Make sure that session states, user data, and preferences are stored persistently to provide for consistent user experiences across devices.
- During the virtual try-on, fine-tune live camera integration for precise body identification and tracking, maybe utilizing machine learning and computer vision technologies.
- To allow in-app purchases, integrate with a secure payment gateway. Add capabilities to handle payments, process refunds, and manage transaction history.
- Create applications that let customers handle orders and shipments, including choosing shipping options, inputting destination addresses, and monitoring package status. Give administrators effective order-management tools.
- To help with customer service communication and to resolve user issues, put in place user feedback systems like live chat and support requests.
- Use encryption, HTTPS, and input validation, among other security measures, to safeguard user data and stop unwanted access.
- Reduce server queries, increase code efficiency, and shorten loading times to improve app speed. Thoroughly test to find and fix performance problems.
- Verify adherence to laws, including GDPR and PCI DSS, to process payments securely and protect your data.

Design and Prototype of the App:

During the design and prototype phases of the AI fitting room application, drawings, storyboards, and scripts are created to visualize the app's user experience and functionality. These prototypes act as a road map for development, allowing designers to detect flaws and improve the product before it is implemented. The app uses cognitive algorithms and user interaction to deliver personalized clothing sizing suggestions as well as an immersive virtual try-on experience. At this moment, the app has used the following software tools: JS, HTML5, CSS, Posenet, Figma, Miro, and Pixabay (for images and videos).

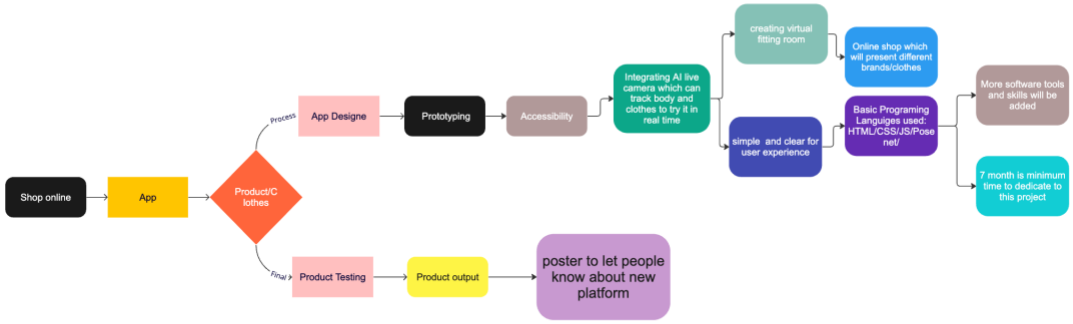

Figure 1 Flow chart by Miro.

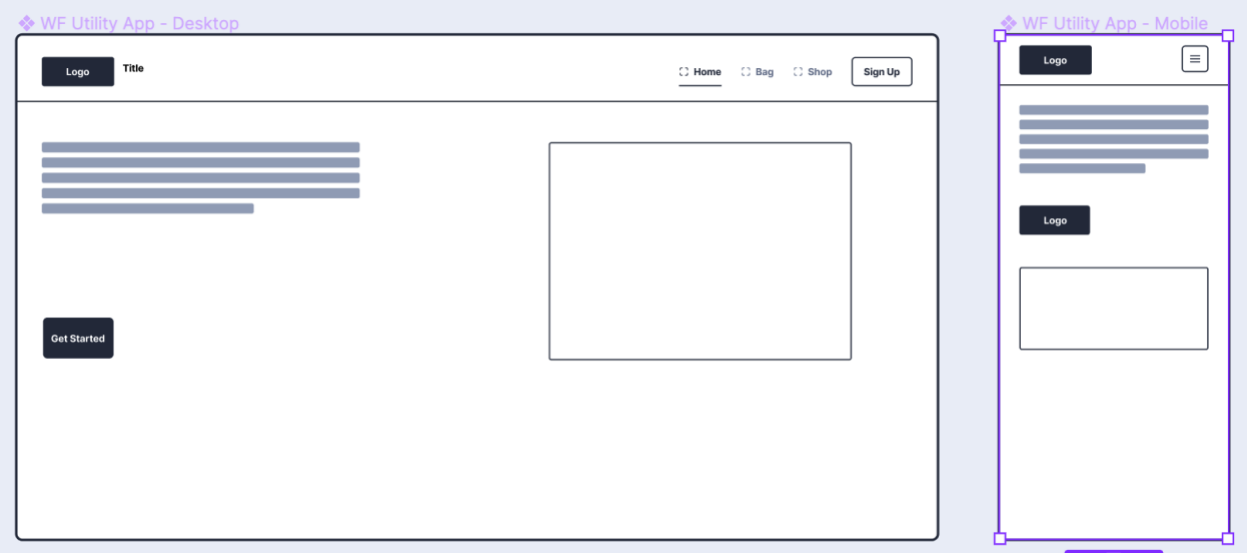

Figure 2 wireframe by Figma.

Live Camera Scanning: Enabling a Real-Time Try-On Experience

To achieve a photo-realistic live video augmentation, the clothing item must be converted from a 3D virtual representation to a 2D image of the item being worn. This is accomplished by recreating the clothing item using the same camera perspective and 3D position as the video clip. The look of the garment is then altered by compositing the produced picture onto the video to create the illusion that the item is being worn. Although the concept of employing the same 3D position and camera viewpoint is easy, users sometimes struggle to see themselves in the same camera pose as in the movie. A solution to this challenge is to employ model-based tracking on the user's body in the video to determine the 3D posture and camera perspective, allowing the clothing item to be recreated with the correct 3D stance and perspective.
The user may use their webcam to view live footage of themselves in the virtual fitting room. This feature provides a real-time try-on experience, allowing users to see how they appear in garments with a single click of the "Try On" button. The live camera capture sends the footage to the fitting room server, which then locates the user's body in each frame. A clothing item, giving the appearance that the user is wearing it. Previous work for live video augmentation frequently used 2D planar segments or 3D models of clothing to perform overlays on the user's body. This study differs from earlier studies in that we employ 3D fabric models and a 3D body to produce a more realistic and natural-looking clothing try-on environment.

Output:

A clothing suggestion system might give information about each ensemble, such as its adaptability for the event, climatic suitability, and colour-harmonising tips. Also included are descriptions of each item, highlighting its value and adaptability. For example, if a dress is casual, it is not appropriate for the intern's professional attire. The device would also indicate where the apparel is appropriate, such as outdoor or inside settings. Research would be undertaken on various fashion styles, and advice would be tailored to the user's fashion personality, as assessed by the MBTI assessment. Additional features might include the system advising the user which things in their wardrobe should be discarded or resold since they are outmoded or unrelated to the user's current style. This can help the user build a virtual wardrobe, and the system can assist in searching for additional things that may be necessary for certain situations.

Conclusion:

The integration of an AI fitting room application is a huge step forward in online shopping technology, providing customers with a personalised and immersive purchasing experience. The app promises to bridge the gap between online and physical shopping experiences by combining cutting-edge technology and clever algorithms, resulting in increased engagement, happiness, and sales in the garment sector.

Reference

S. W. P. N. M., W. *et al.* (2021) 'Virtual Dressing Room: Smart Approach to Select and Buy Clothes', in *2021 3rd International Conference on Advancements in Computing (ICAC)*. *2021 3rd International Conference on Advancements in Computing (ICAC)*, Colombo, Sri Lanka: IEEE, pp. 193–198. Available at: https://doi.org/10.1109/ICAC54203.2021.9671198.

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