PROJECT PROGESS REPORT (Week 1)

"Caffeine Overflow's - Ai driven virtual try-on system in E-commerce"

Junior Design

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Project Overview:

Our project focuses on developing an AI-driven virtual try-on system that leverages e-commerce technologies, augmented reality (AR), and 3D modeling to enhance online shopping experiences. This system will allow users to try on clothing virtually, making it easier to make purchasing decisions while reducing product returns.

Projected Plan for Week 1:

- **E-Commerce Development Setup**: Initial setup of the frontend, navigation, and routing.
- **Data Collection & Dataset Preparation**: Collect relevant datasets for virtual try-on and personalization.
- **Front-End Setup**: Develop the basic structure of the website and implement initial user interface components.
- **AR Initial Integration**: Integrate the basic AR functionality for trying on products.

Progress Made in Week 1:

1. Data Collection & Dataset Preparation:

We successfully collected and organized three main datasets to support the different functionalities of our virtual try-on system:

- **DeepFashion Multimodal Dataset**: This dataset contains a variety of multimodal fashion data including **DensePose**, **keypoints**, **segmentation masks**, **labels**, and **images**. This dataset will be essential for developing our body pose estimation and keypoint detection features.
- **Virtual Try-On Dataset**: We have another dataset specifically tailored for virtual try-on, which includes:
    - **Train and Test data**.
    - **openpose_json** files and images for both **clothes** and **clothes masks**. This dataset will be vital in training our model to map clothing items onto users' body images in a realistic way.
- **Personalization Recommendation Dataset**: This dataset consists of images of clothing items and a corresponding **CSV file** containing metadata. This will help in building a personalized recommendation system, which will provide tailored clothing suggestions based on the user’s preferences.

Progress:

- Data was successfully collected and organized.
- Some initial preprocessing steps were completed (such as organizing folders, exploring the metadata).

Next Steps:

- Continue dataset cleaning and preparation for model training.
- Further preprocessing such as resizing images and normalizing data.

2. Frontend Setup:

We initiated the frontend development using **React.js** for a dynamic and responsive user interface. The following pages were developed:

- **Homepage**: The homepage includes basic navigation and an introduction to the virtual try-on system.
- **Product List Page**: This page displays products that users can try on.
- **Product Detail Page**: Displays individual product details and an option to try on the product virtually.

Progress:

- Frontend structure is in place.
- Basic routing has been implemented.
- User interface components (such as navigation bar and product cards) have been completed.

Next Steps:

- Implementing Other pages with functionality with Virtual-Try on page
- Continue refining the UI for a better user experience.

3. Initial AR Integration:

We implemented a "Try On" button on the product detail page. Upon clicking the button, a "Work in Progress" page is displayed, indicating that AR functionality is being developed.

Progress:

- A "Try On" button is placed, and the transition to the "Work in Progress" page is working.

Next Steps:

- Implement the actual AR functionality where users can interact with 3D clothing models on their images or in real-time using their camera.
- Test and refine the AR functionality for better fitting accuracy.

Challenges & Areas Yet to Be Completed:

- 3D Model Development: While we collected the datasets necessary for generating 3D models, the actual development of 3D models from 2D images has not yet been implemented. We will focus on this in the coming weeks by exploring tools like three.js or using pre-trained models to generate the necessary 3D clothing models.
- E-commerce Integration: Although the basic frontend setup is done, the e-commerce features like cart functionality, user authentication, and product purchase systems are yet to be integrated.

Contribution:

Aporbo	Tasfia
Led the dataset collection process, sourcing relevant datasets for virtual try-on, such as clothing images, cloth masks, and body pose annotations.	Collected dummy images for an e-commerce, created dummy products file and other initial necessary files and installation
Worked on the preprocessing of collected datasets, including cleaning, resizing, and organizing the data for further model development.	Setting up the initial structure of the website, including navigation and basic routing.
Initiated the 3D model development by exploring datasets containing .obj and .npy files and beginning the first steps in understanding and handling 3D model formats.	Worked on the components necessary for displaying products and their details
Conducted data annotation to label and organize the dataset for the virtual try-on system.	Integrated the initial AR feature, ensuring the website's "Try On" button and navigation to the "Work in Progress" page
Took additional responsibilities such as working on the websites bug fixing and preparing the groundwork for further 3D modeling and AR implementation.	Implemented dummy login and cart page

Conclusion:

In Week 1, we achieved key milestones, including the successful setup of the frontend, collection of relevant datasets, and the implementation of a basic AR feature. While the AR functionality currently leads to a "Work in Progress" page, this marks the start of integrating AR into the user experience. Additionally, our dataset preparation has laid a solid foundation for future developments, especially for personalized recommendations and 3D modeling. However, we were unable to fully implement the 3D model development and backend setup in this week, but these will be our primary focus moving forward. We are confident that with the progress made so far, we are on track to deliver a fully functional virtual try-on system in the coming weeks.