VIRTUAL TRIAL ROOM – TRANSFORMING THE RETAIL EXPERIENCE WITH AI

New Era New Technology

Members

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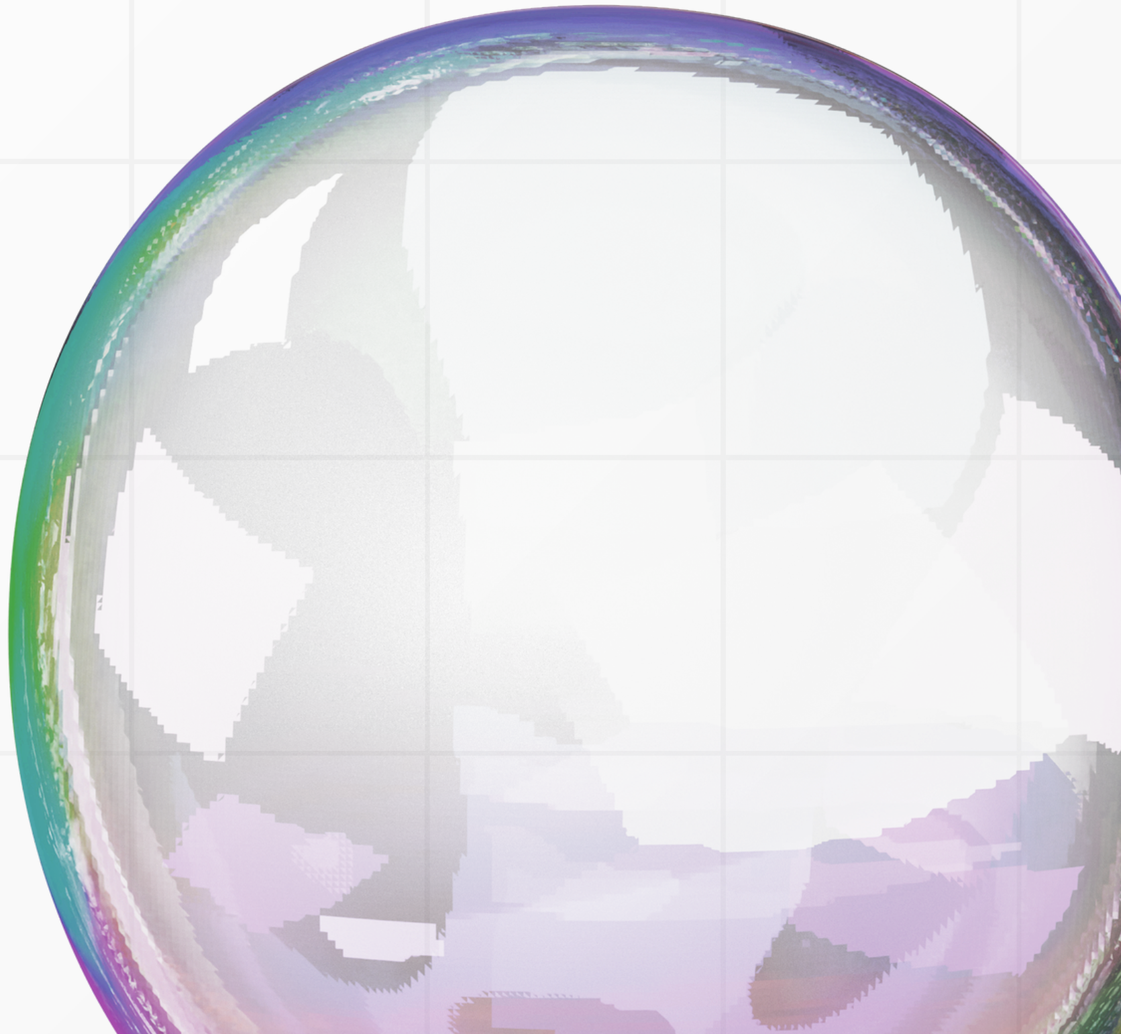
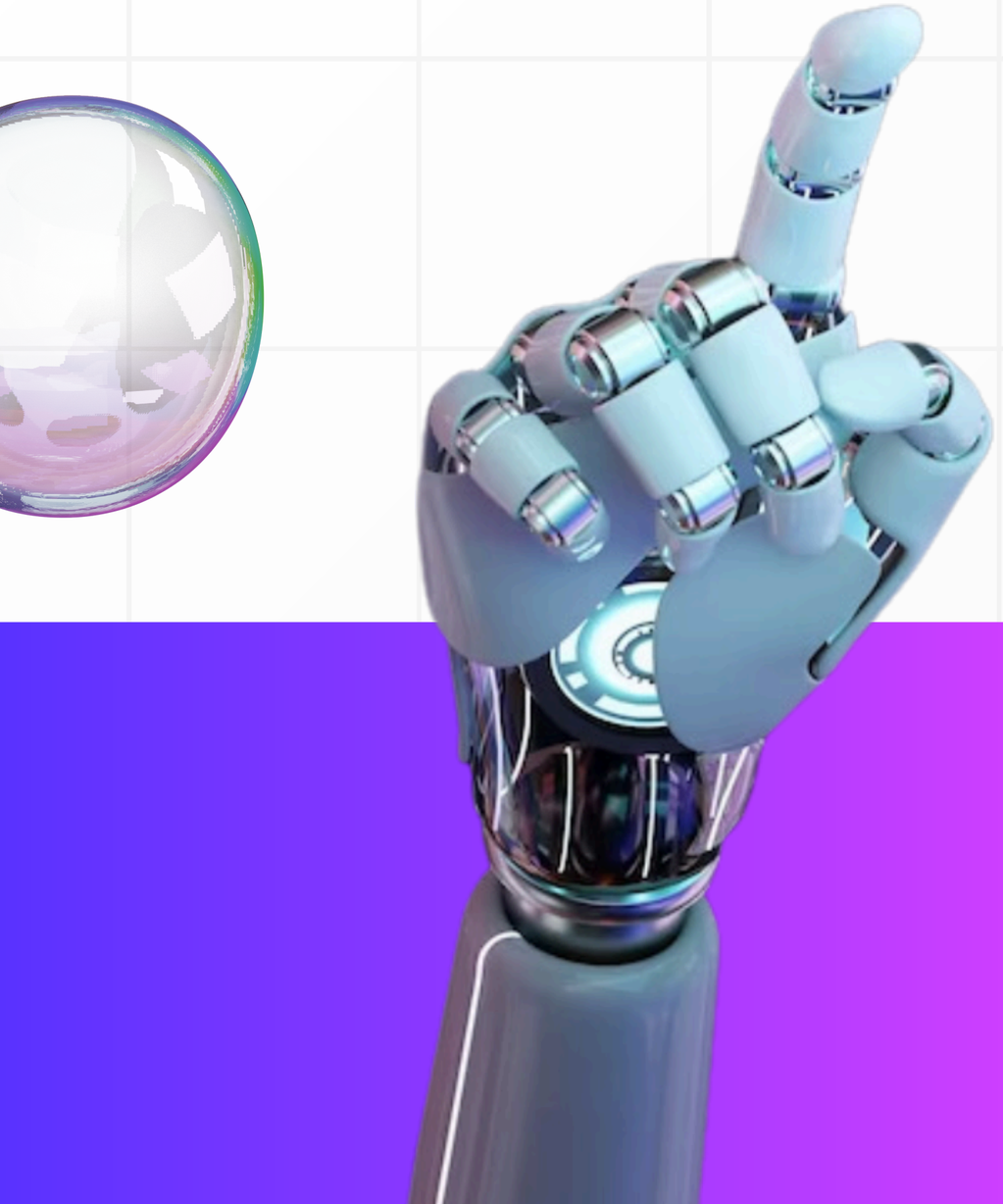
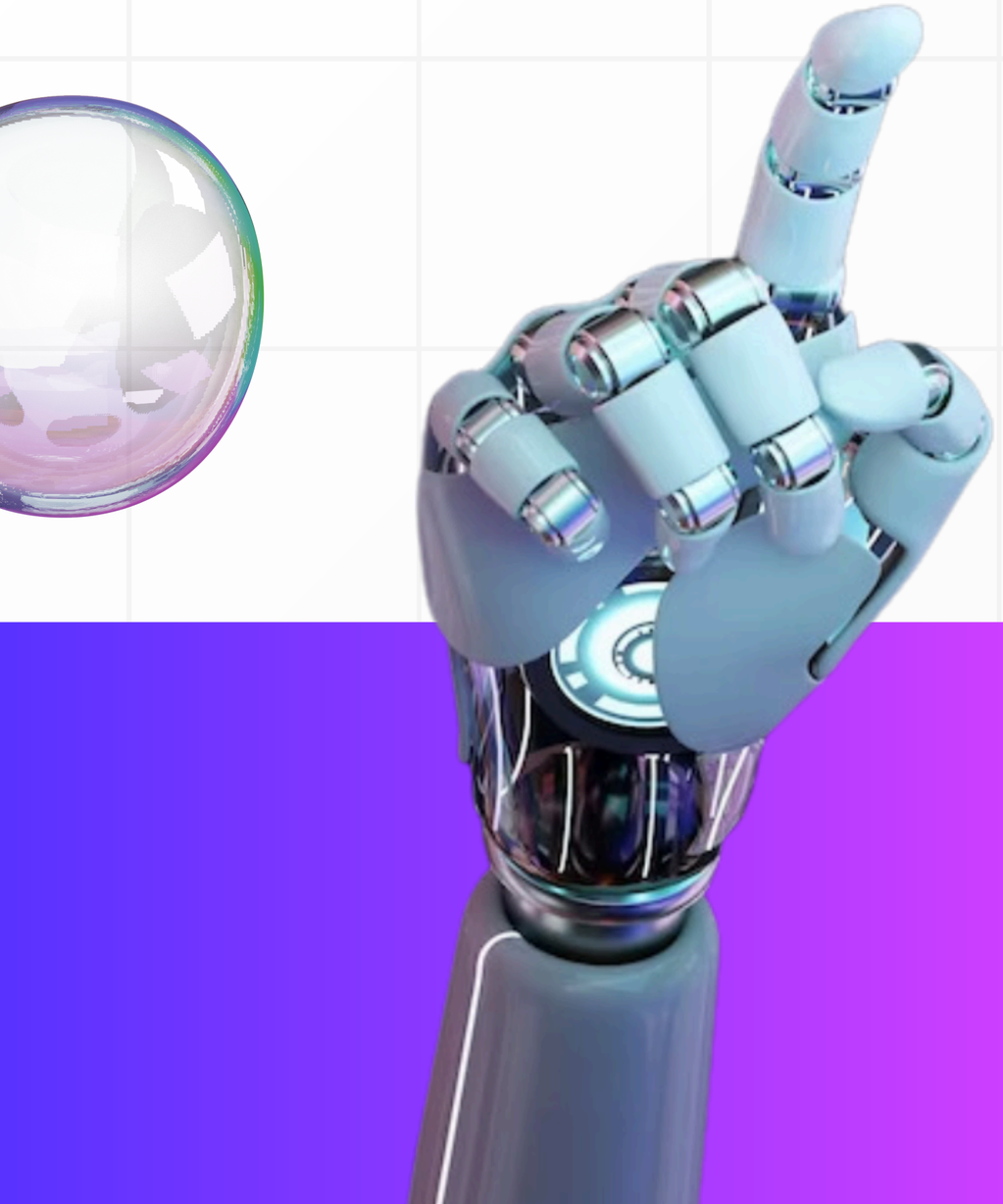




Problem

Challenge in Online Shopping: Online shoppers often struggle with visualizing how clothing will fit and look on them without trying it on physically. This leads to a high rate of returns, dissatisfaction, and uncertainty in making purchase decisions.

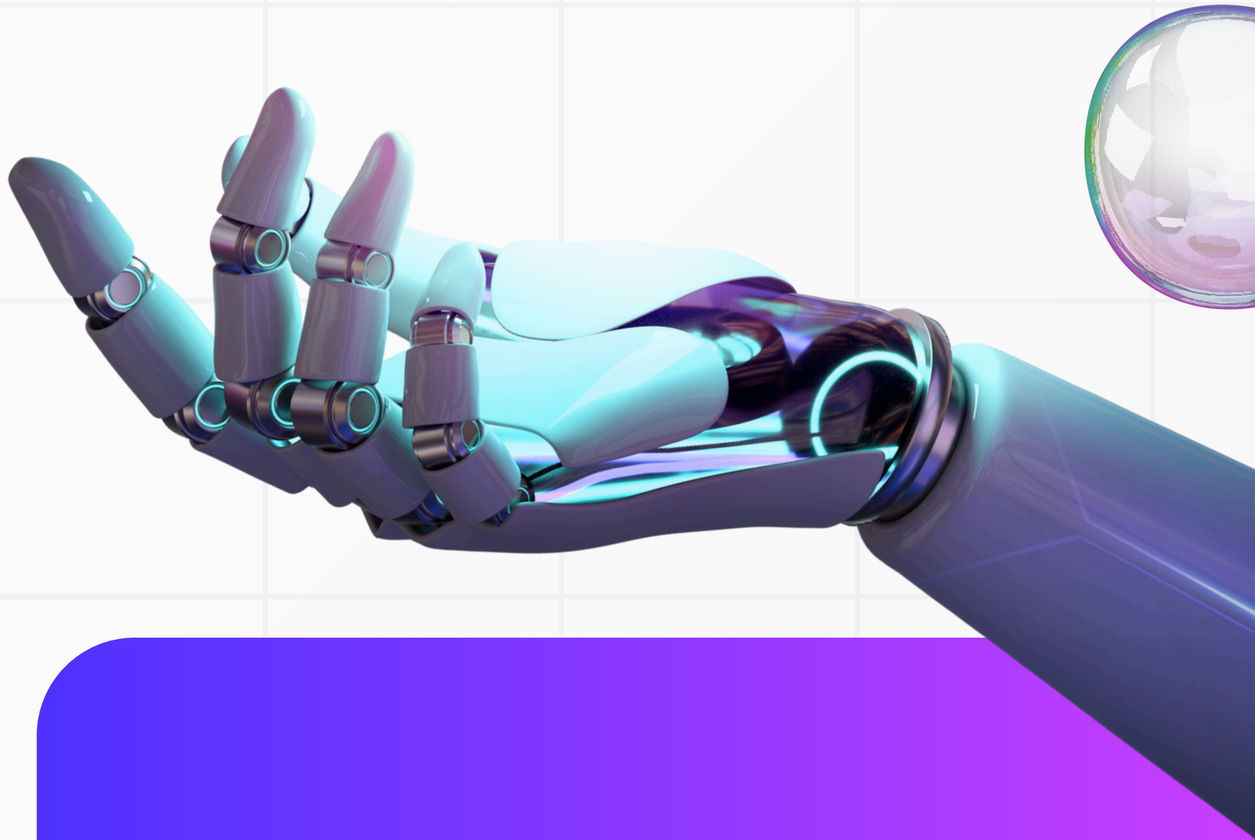


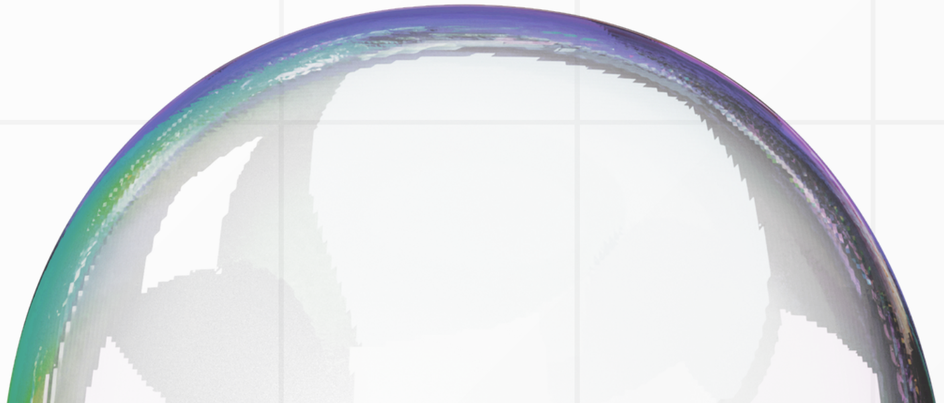
Problem

Objective: To develop a virtual trial room that allows users to try on clothes digitally, reducing the need for physical fitting and improving the online shopping experience.

Significance

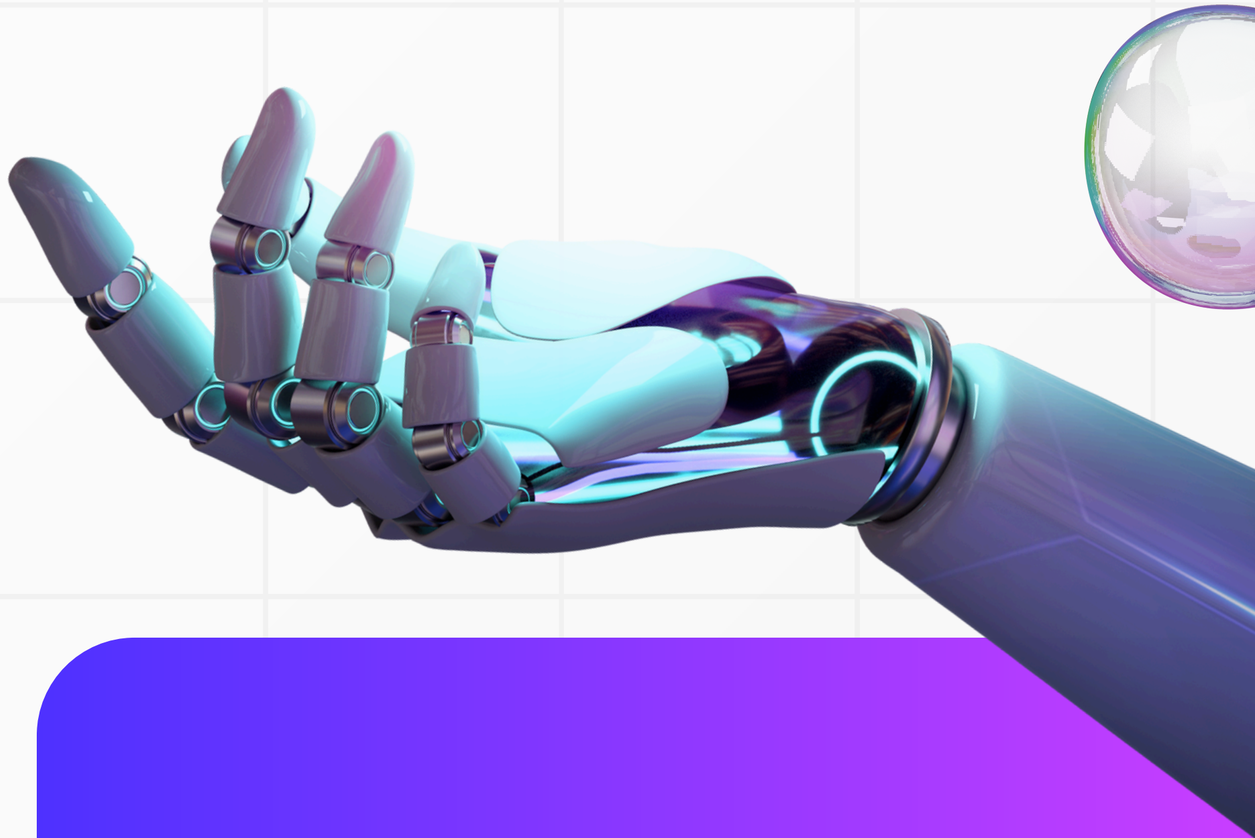
Impact on E-commerce: A virtual trial room can significantly enhance the online shopping experience by reducing return rates, increasing customer satisfaction, and driving more confident purchasing decisions.

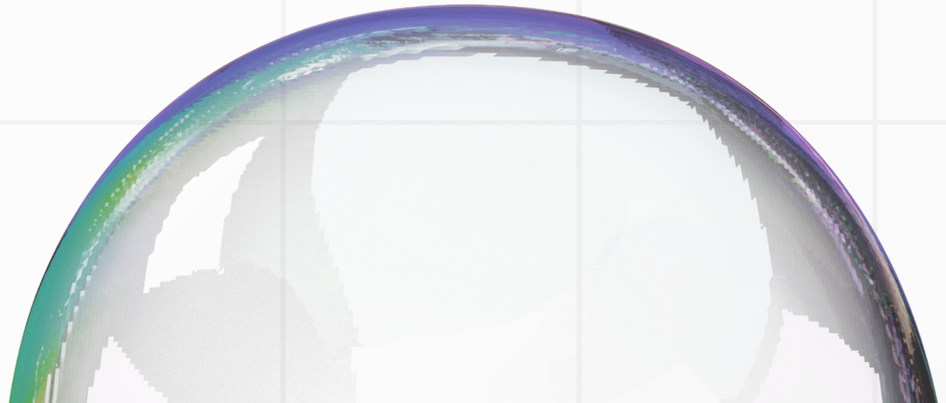




Significance

- Customer Experience: This technology empowers customers to make better-informed choices, which can lead to increased loyalty and retention.
- Business Value: Retailers can reduce operational costs associated with returns and improve their conversion rates by offering a more interactive and engaging shopping experience.





Past Projects

Past Available Project

- Overview: An early virtual fitting tool integrated into various online retail platforms. Virtusize allowed users to compare the measurements of clothing they were considering buying with clothes they already owned.
- Technology: Relied on 2D comparison without the use of AI or 3D modeling.
- Outcome: Provided basic size recommendations but lacked a realistic visualization of how the clothing would fit.

Methodology– ML Canvas

THE MACHINE LEARNING CANVAS

Designed for: Trial Room Project | Designed by: Group 11 | Date: 16/08/2024

Iteration: =

PREDICTION TASK

Type of task? Entity on which predictions are made? Possible outcomes? Wait time before observation?

Type of task? Image classification, object detection, Recommendation and virtual fitting.

Entity on which predictions are made? User's body measurements, clothing items, and body poses.

Possible outcomes? Accurate virtual fit, mismatched fit, or no match available.

Wait time before observation? Real-time processing, ideally within a few seconds to maintain user engagement.

DECISIONS

How are predictions turned into proposed value for the end-user? Mention parameters of the process / application that does that.

How are predictions turned into proposed value for the end-user? The ML model predicts how well a clothing item will fit a user's body in real-time and displays the virtual trial results. The application interface shows the user a realistic virtual fitting experience.

Parameters of the process/application: User measurements, clothing dimensions, fabric flexibility, and posture data are analyzed to generate the visual fitting results.

VALUE PROPOSITION

Who is the end-user? What are their objectives? How will they benefit from the ML system? Mention workflow/interfaces.

Who is the end-user? Online shoppers, retail customers, and fashion brands.

What are their objectives? To try on clothes virtually before purchasing, ensuring the right fit and style without the need to physically visit a store.

How will they benefit from the ML system? The end-user can see a realistic preview of how clothes will look and fit, reducing return rates and enhancing customer satisfaction with online shopping.

DATA COLLECTION

Strategy for initial train set & continuous update. Mention collection rate, holdout on production entities, cost/constraints to observe outcomes.

Strategy for initial train set & continuous update: Use a dataset of labelled images from Kaggle containing various body types, clothing items, and poses. Continuously update the model with user feedback and additional data from different demographics.

Mention collection rate holdout on production entities cost/constraints to observe outcomes: Data can be collected through user inputs, fashion brand partnerships, and crowdsourced images, ensuring diversity in the dataset while considering user privacy and data storage constraints.

DATA SOURCES

Where can we get (raw) information on entities and observe outcomes? Mention database table API methods, websites to scrape, et

Where can we get (raw) information o entities and observed outcomes? Publi available datasets like DeepFashion, user-submitted photos, clothing brand catalogs, and e-commerce websites.

Mention database tables, API method websites to scrape, etc.: APIs from fashion brands, image scraping from online stores, and user-uploaded photo via the application.

IMPACT SIMULATION

Can models be deployed? Which test data to assess performance? Cost/gain values for (in)correct decisions? Fairness constraint?

Can models be deployed? Yes, models can be deployed in a cloud environment for scalability and real-time processing.

Which test data to assess performance? A test set containing various body shapes, clothing types, and poses to ensure the model's generalization.

Cost/gain values for (in)correct decisions? Correct decisions enhance user experience, reduce returns, and boost sales, while incorrect decisions might lead to customer dissatisfaction and increased return rates.

Fairness constraint: Ensure inclusivity across different body types and demographics to avoid bias in the virtual fitting experience.

MAKING PREDICTIONS

When do we make real-time / batch pred.? Time available for this + featurization + post-processing? Compute target?

When do we make real-time/batch predictions? Real-time predictions during user interaction with the virtual trial room.

Time available for this + featurization + post-processing? Less than a few seconds to ensure smooth user experience.

Compute target? Cloud-based GPU or TPU instances for real-time processing.

BUILDING MODELS

How many prod models are needed? When would we update? Time available for this (including featurization and analysis)?

How many prod models are needed? One main model for real-time fitting with possible variations for different clothing types.

When would we update? Regularly, based on new data inputs and user feedback.

Time available for this (including featurization and analysis)? Continuous, with a pipeline for regular updates.

FEATURES

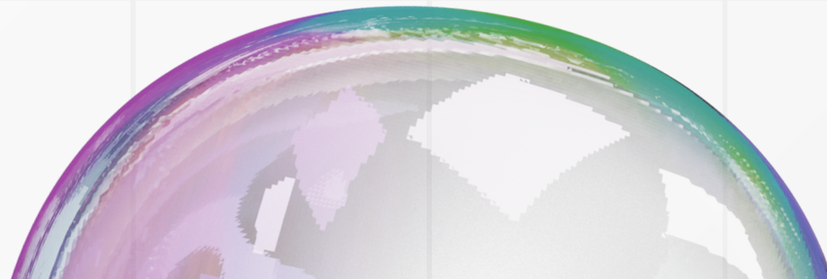
Input representations available at prediction time, extract from raw data sources.

Input representations available at prediction time extracted from raw da sources: User body measurements, clothing images, user-uploaded photo and pose data.

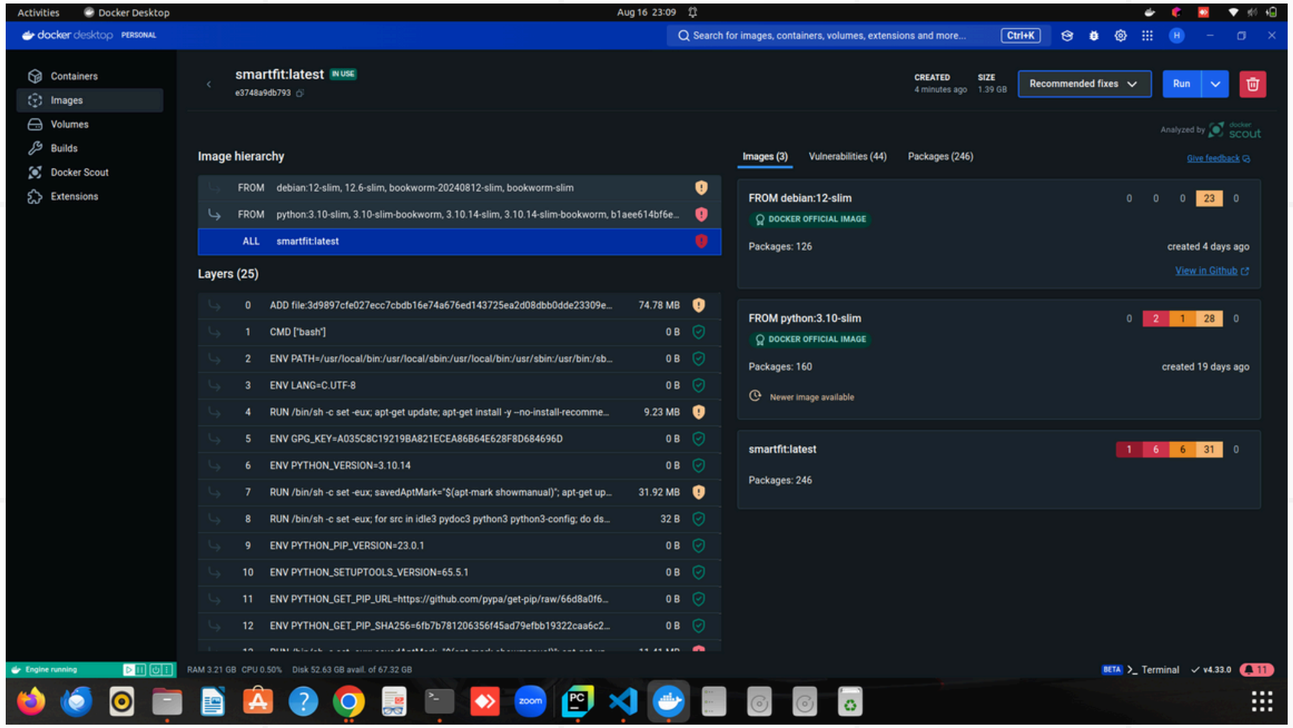
Model Benchmarking

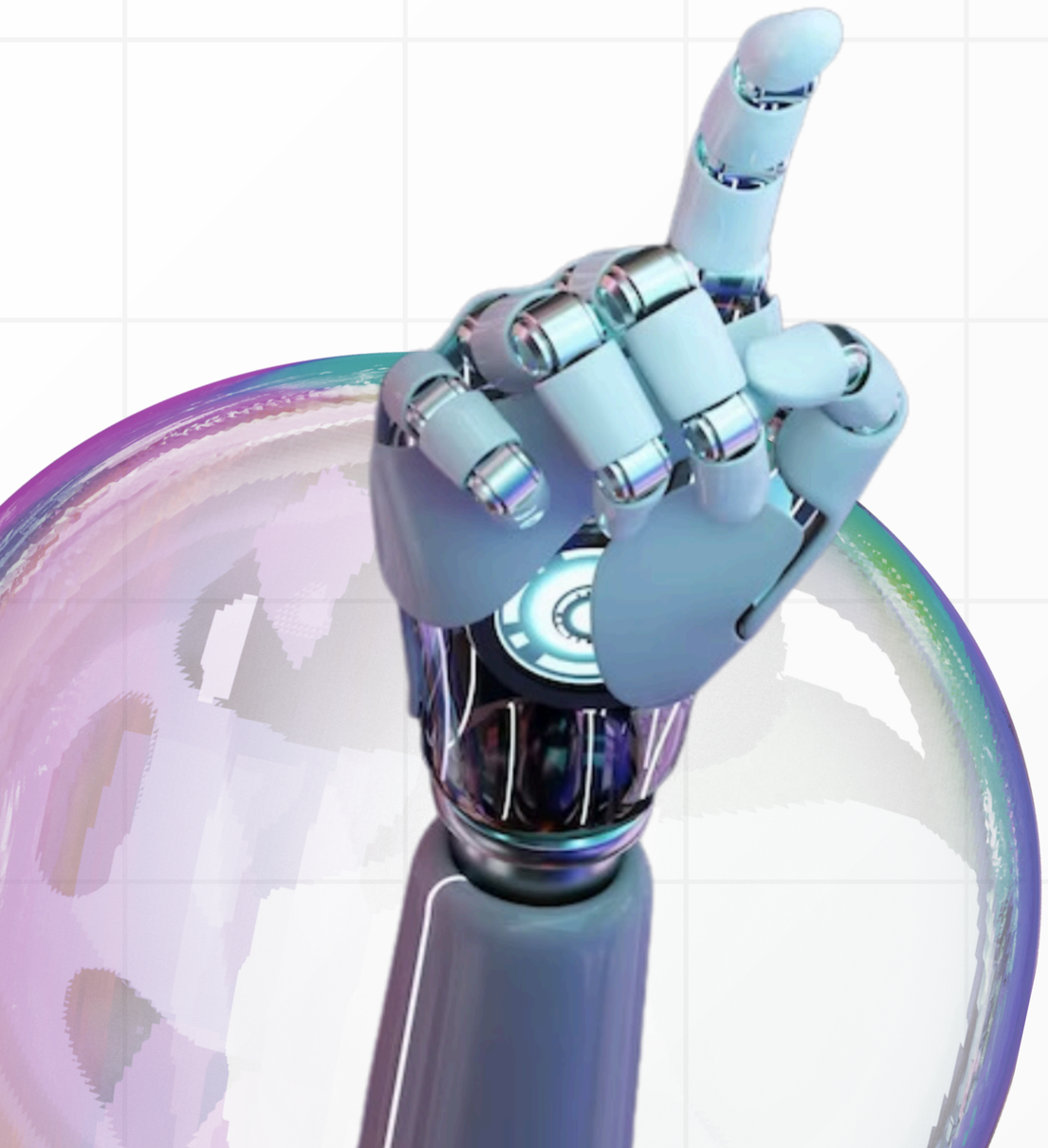
- Distance(): Calculates the Euclidean distance between two points.
- shrink(): Crops the image to remove unnecessary transparent areas.
- validatex() and validatey(): Validates the coordinates of detected keypoints.
- overlay_image_alpha(): Overlays one image on top of another with an alpha mask for transparency.
- changecolor(): Changes the color of the clothing image based on the given color rules.

The script uses a pre-trained model (ssd_512_mobilenet1.0_coco) for detecting people and another model (simple_pose_resnet18_v1b) for pose estimation.

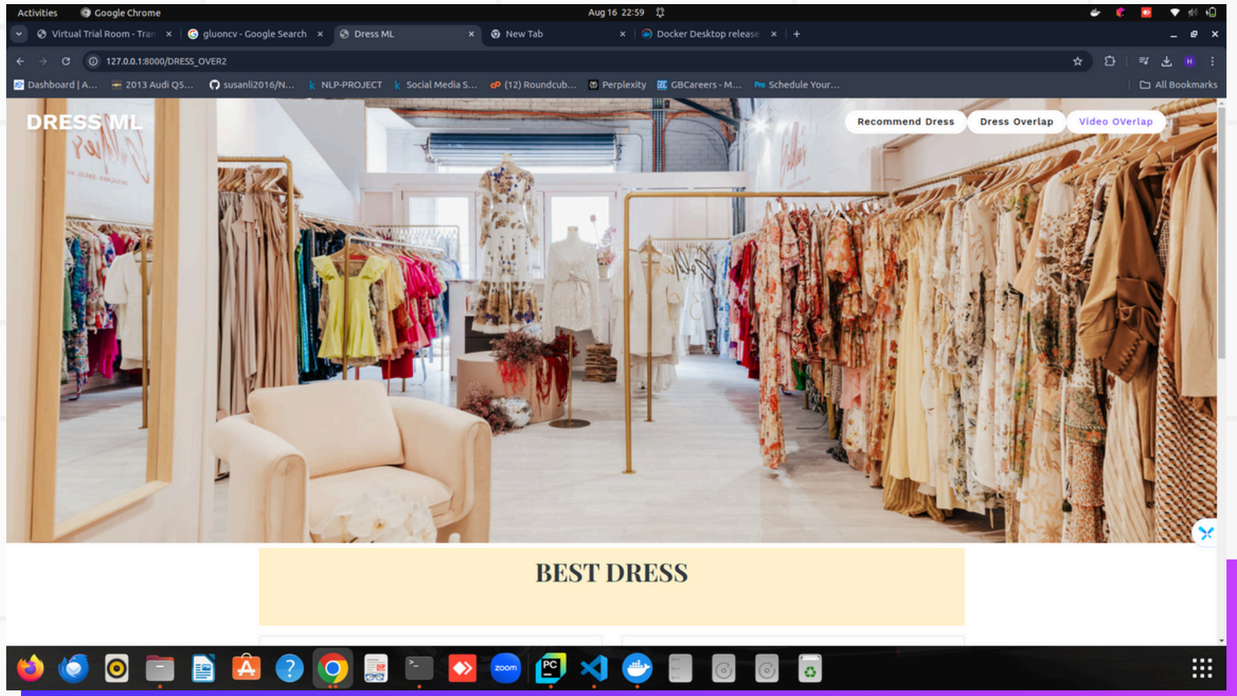


Model Deployment



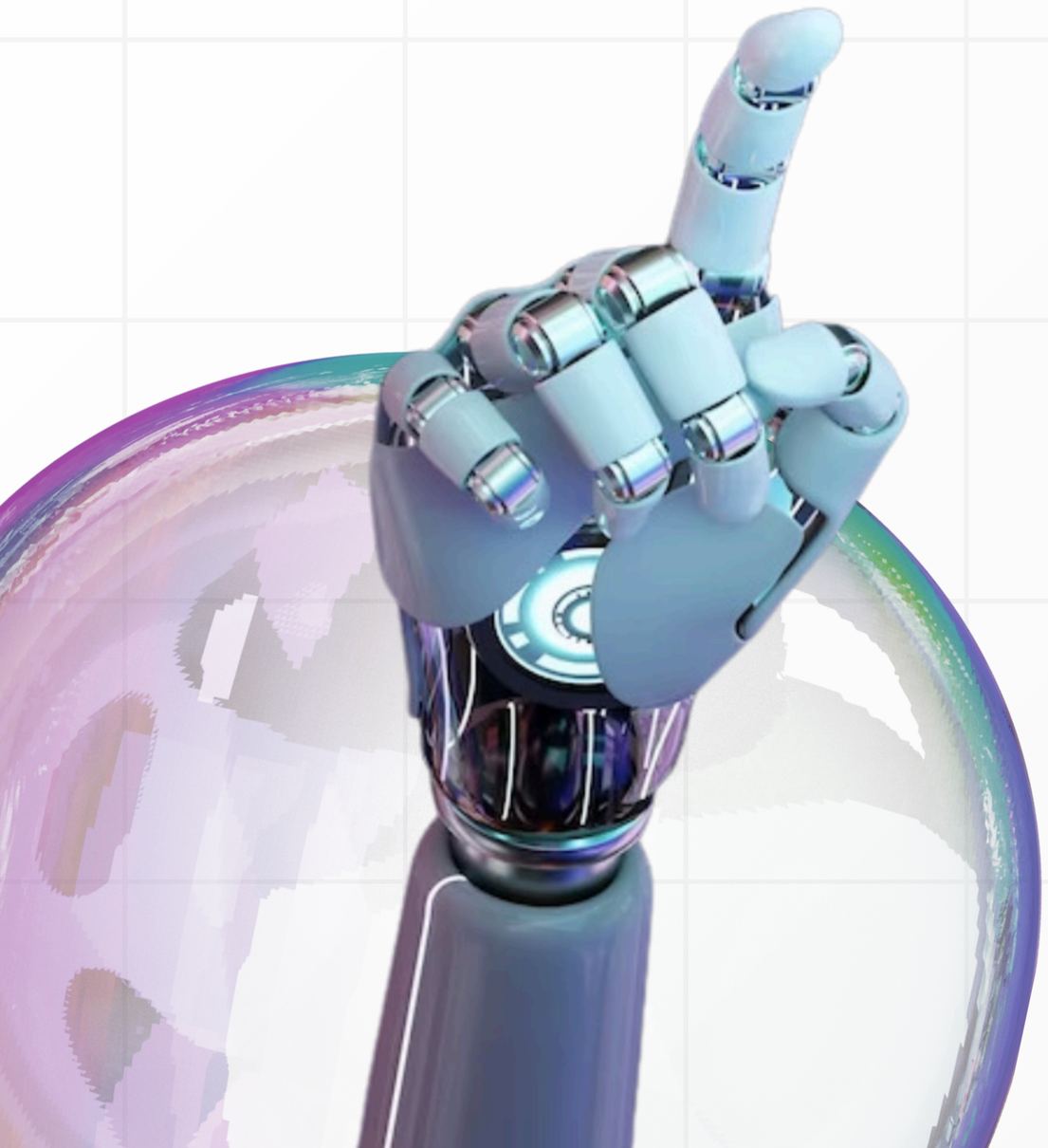


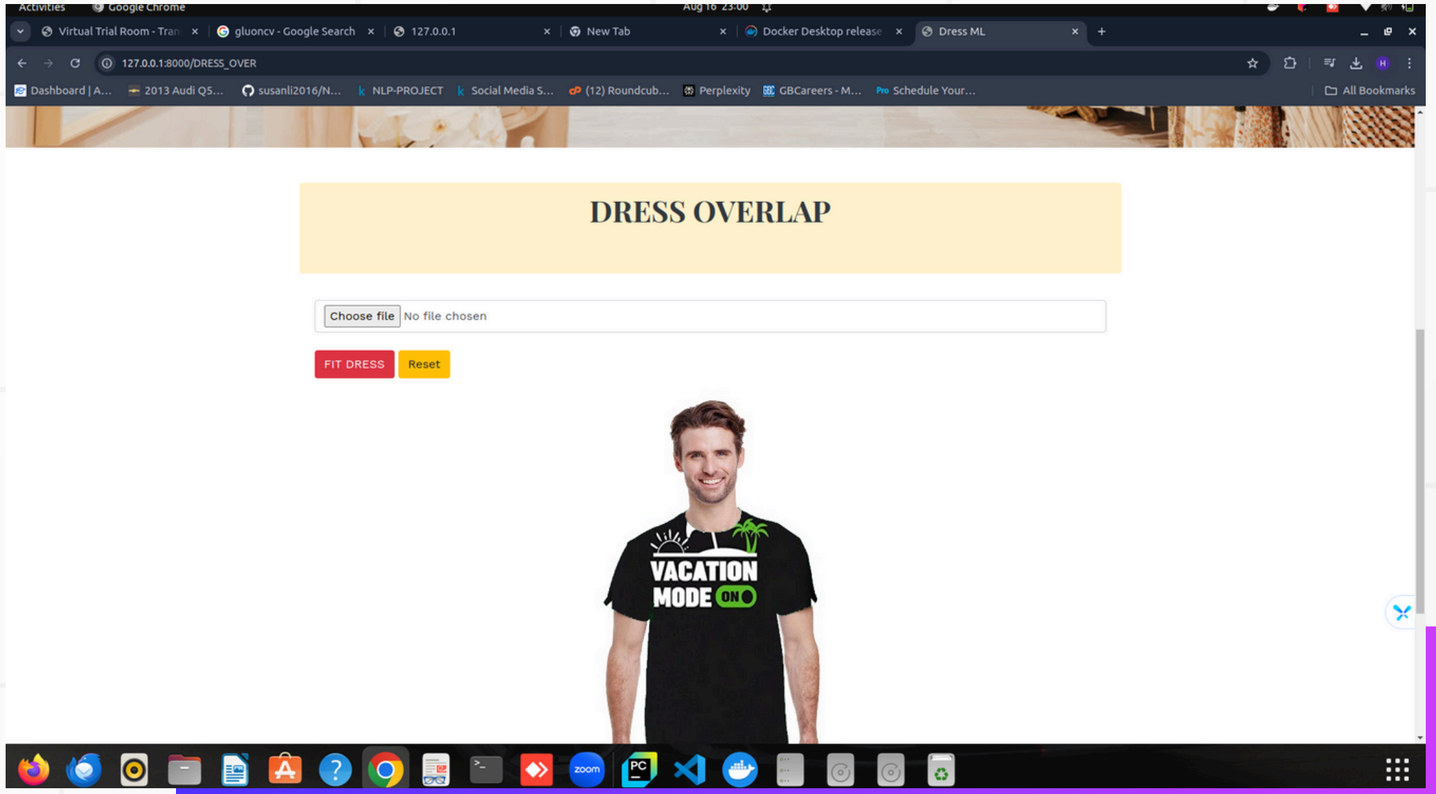
Achievement



BEST DRESS

Achievement





Thank You.