



National University Of Computer and Emerging Sciences, Karachi,  
Pakistan



**Jeanius Digital**

**Project Report**

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**Group Members:**

Sharjeel Ahmed  
Shazim Ali Mughal  
Sameer Raza

20K-0288  
20K-1032  
20K-0420

**Instructor:**  
**Miss Sumiyah Zahid**

**Course:**  
**Deep Learning For Perception**

## Objective

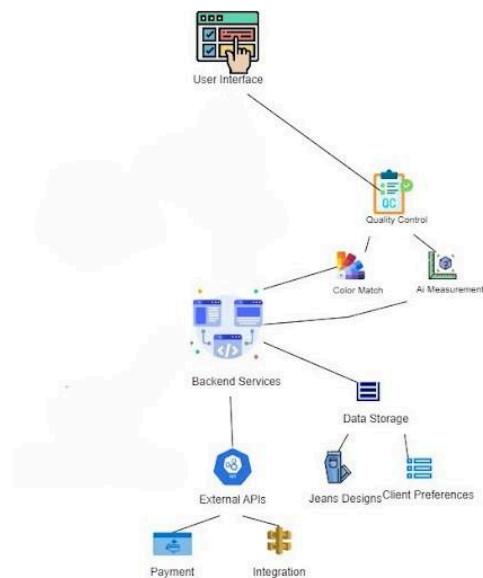
The objective of Jeanius Digital is to revolutionize the jeans industry by developing an AI-powered platform that streamlines production processes, and enhances quality control. We aim to achieve this by automating quality control (ie. Color matching & Measurements procedures).

## Problem Statement

1. Manual quality control processes leading to errors and inconsistencies in jeans production.
2. Lengthy design cycles and delays in responding to market trends.
3. Inability to provide personalized experiences and virtual try-ons for customers.

By leveraging AI and CV technologies, Jeanius Digital aims to automate these processes, improve efficiency, and enhance accuracy.

## Methodology



1. Data Acquisition and Preprocessing
  - Data Collection: Gather denim images from various sources, including local inventory, manufacturer catalogs, and online databases.
  - Image Preprocessing: Use the OpenCV library to load and resize images to a standard size. Convert images from BGR to HSV color space for color segmentation.
2. Color Segmentation and Object Detection
  - Color Definition: Define HSV color ranges for denim categories.
  - Color Segmentation: Segment denim colors using defined ranges. Apply thresholding and contour detection for object identification.
  - Bounding Boxes and Labels: Draw bounding boxes around segmented objects and add labels for visual identification.
3. User Interaction

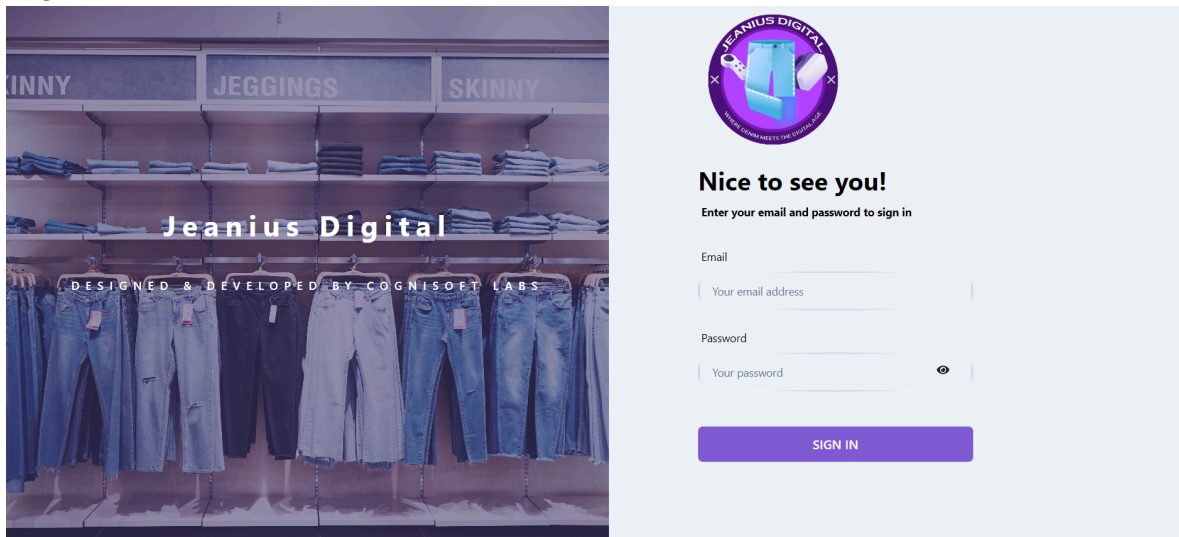
- Interactive user dashboard for multiple options, the user can select to run color matching model or measurement model.
  - After processing the relevant results are shown to the user.
4. System Integration and Testing
- Integration: Integrate color matching and jeans measurements models into Jeanius Digital's web app.
  - Testing and Validation: Test system performance with sample denim images. Validate accuracy against ground truth data and from a denim manufacturer.

## Results

1. **Results Evaluation:** Evaluate system performance in terms of accuracy, speed, and user experience.
2. **Optimization:** Fine-tune color matching and measurements models for improved accuracy. Implement weighted thresholding for better accuracy.

## User Interface:

### Login Screen:



Measurements Dashboard:

Dashboard


Color Matching

Measurements

Users

### Measurements

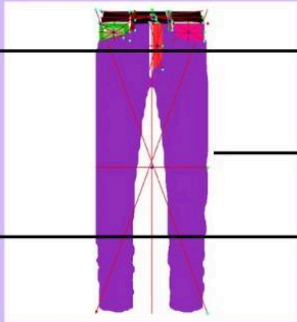
Upload Image To Process



Upload Image Again

10

Start Processing



Measurements section

Segmented image of jeans

Upload Image can be automated

process button can be automated

Jeans Measurements (Centimeters)

Center Distance: 58.43

Right Length: 58.43

Left Length: 58.49

Right Diagonal Distance: 116.92

Left Diagonal Distance: 116.92

Area: 350638.5

Perimeter: 5814.45

Center Distance: 6.58

Right Length: 6.66

Left Length: 6.53

Right Diagonal Distance: 13.19

Left Diagonal Distance: 13.19

Area: 2572.5

Perimeter: 534.12

Front Right Pocket

Pixel To CM factor: 0.1

Top to Bottom Height: 12.3

Left Width: 6.5

Right Width: 6.5

Top Distance: 7.02

Bottom Distance: 6.98

Center Distance: 6.94

Right Length: 7.02

Left Length: 6.89

Right Diagonal Distance: 13.91

Left Diagonal Distance: 13.91

Area: 6293.5

Perimeter: 355.5

Front Beltwidth

Pixel To CM factor: 0.1

Top to Bottom Height: 41.4

Left Width: 4.3

Right Width: 4.3

Top Distance: 20.82

Bottom Distance: 20.82

Center Distance: 20.81

Right Length: 20.82

Left Length: 20.81

Right Diagonal Distance: 41.62

Left Diagonal Distance: 41.62

Area: 13241

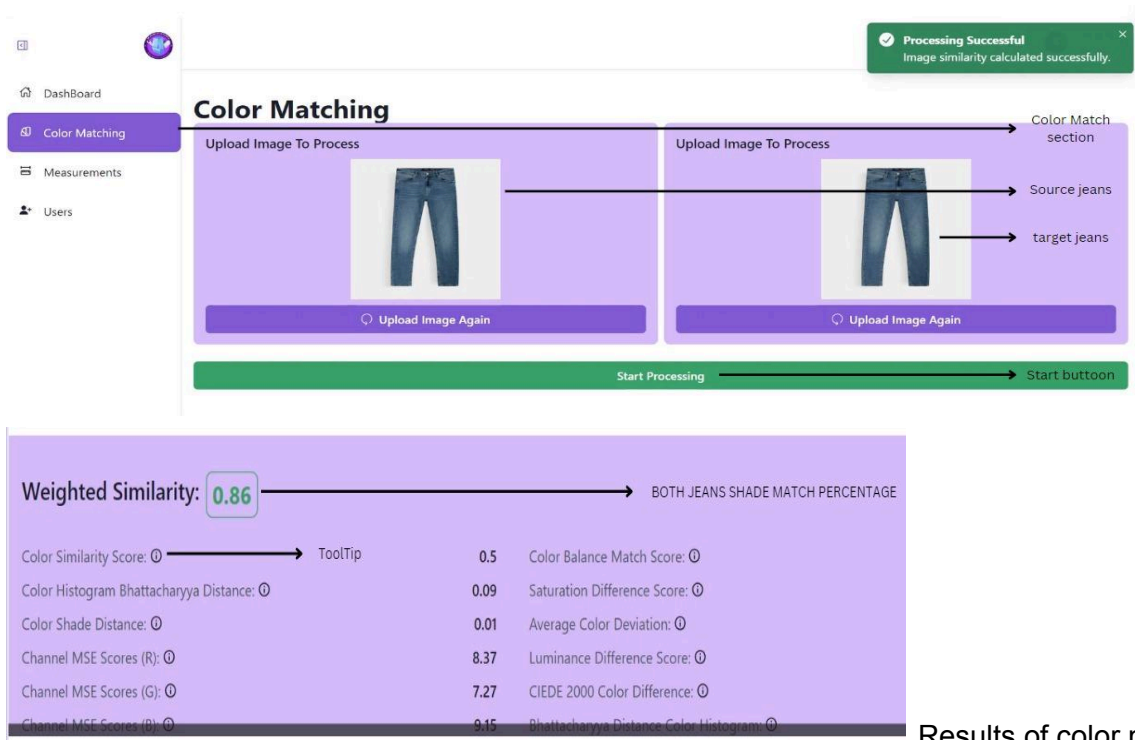
Perimeter: 1337.05

Main Button

Front Fly J

Results of measurements

Color Matching Dashboard:



Results of color matching

Users Dashboard:

The Users Dashboard interface includes a sidebar with navigation links: Dashboard, Color Matching, Measurements, and Users. The main section is titled "Users" and contains a search bar with the placeholder text "Search by name, description, or Purchased From". A "New User" button is located in the top right corner. Below the search bar is a table with the following columns: NAME, USER NAME, ROLE, DEPARTMENT, JOINED DATE, and ACTIONS.

NAME	USER NAME	ROLE	DEPARTMENT	JOINED DATE	ACTIONS
Aslam Butt	aslam.butt	employee	Color Matching	20-02-2010	⋮
Farida Khan	farida.khan	head	Measurements	15-06-2015	⋮
Nadeem Malik	nadeem.malik	employee	Color Matching	03-11-2018	⋮
Saima Akhtar	saima.akhtar	employee	Measurements	12-09-2012	⋮
Usman Ahmed	usman.ahmed	head	Color Matching	08-04-2017	⋮
Ayesha Riaz	ayasha.riaz	employee	Measurements	23-01-2019	⋮
Imran Zafar	imran.zafar	head	Color Matching	10-07-2014	⋮
Nazia Iqbal	nazia.iqbal	employee	Color Matching	05-12-2016	⋮
Kamran Akram	kamran.akram	employee	Measurements	18-03-2021	⋮

## References:

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6. Zhu, L., Huang, X., Shen, X., Zhang, S., & Zhang, W. (2019). "Towards virtual try-on: A generative adversarial network-based approach for clothing retrieval, synthesis, and recommendation." In *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*, pp. 3482-3491.
7. Ian J. Goodfellow, Jean Pouget-Abadie, Mehdi Mirza, Bing Xu, David Warde-Farley, Sherjil Ozair, Aaron Courville and Yoshua Bengio (2014). Generative adversarial nets. *Advances in Neural Information Processing Systems*, 2672-2680.