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Department of Computer Science and Engineering
Data Science

AI powered styling based on the vibe

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Project Guide
Ms. Ujwala Pagare

Outline

- Introduction
- Literature Survey of the existing systems
- Limitations of the existing systems
- Problem statement
- System Design
- Technologies and methodologies
- Implementation
- Conclusion
- References

Sustainable Development Goals (SDG) mapped

- SDG 12: Responsible Consumption and Production.
  The AI reduces textile waste and returns by ensuring personalized and accurate clothing recommendations.

- SDG 9: Industry, Innovation, and Infrastructure.
  The system uses innovative AI technology to improve industrial processes like demand forecasting and supply chain efficiency.

Introduction

- Fashion is a way to express identity, but many struggle to choose outfits that reflect their true style.
- Our AI stylist helps users discover their aesthetic through quizzes, and preferences.
- It provides real-time outfit suggestions tailored to mood, events, and personal style.
- Features like a virtual closet simplify daily fashion choices.

Motivation:

- Many struggle to select outfits that reflect their true personality.
- Fashion today is more about self-expression than just following trends.
- People, especially Gen Z, want outfits that match their mood, vibe, and personality

Objectives:

- To build a user authentication allowing saved preferences. [JWT (bcrypt) and user-embedding aggregation.]
- To help users define unique fashion aesthetic through an AI driven quize experience. [NLP Algorithm]
- To suggest personalized outfits based on user's mood upcoming events, and individual style preferences. [K-Means Algorithm]
- To connect with fashion APIs or mock datasets to source real product examples and outfit combinations. [NLP matching Algorithm]

Literature Survey of the existing system

Sr. no	Title	Author	Year	Outcome	Methodology	Demerits
1	Visual Recommendation with User Intent for E-Commerce	Meng et al.	2019	Developed a system to recommend visually compatible items by predicting user purchase intent in e-commerce.	Deep Factorization Machine combined with visual features and collaborative filtering.	Primarily focused on **boosting sales,** , non-purchase-driven user personalization.

Literature Survey of the existing system

Sr no	Title	Author	Year	Outcome	Methodology	Demerits
2	Personalized Outfit Recommendation with Self-Attentive Modulation	Chen et al.	2020	Introduced a framework to learn fine-grained fashion styles and generate aesthetically pleasing and personalized outfits.	Self-Attentive Modulation to extract item features, followed by coordination prediction network.	The user's **style** is a learned vector, but the system relies on structured metadata **lacking explicit inputs for "mood" or "vibe."**

Literature Survey of the existing system

Sr no	Title	Author	Year	Outcome	Methodology	Demerits
3	Context-Aware Personalized Fashion Recommendation	Patel & Singh	2023	Introduced contextual signals (season, event type) for more relevant outfit suggestions.	Context embedding layer integrated with attention mechanism to fuse item and context features.	Limited ability to handle ambiguous or subjective contexts like “mood” or “vibe”

Literature Survey of the existing system

Sr no	Title	Author	Year	Outcome	Methodology	Demerits
4	Fashion Outfit Recommendation with Graph Neural Networks	Liu et al.	2021	Proposed a graph-based model to capture relationships between clothing items and recommend coherent outfits.	Used Graph Neural Networks to model compatibility between items and predict matching scores.	Requires large labeled fashion datasets; performance drops when new/unseen styles appear.

Literature Survey of the existing system

Sr no	Title	Author	Year	Outcome	Methodology	Demerits
5	Style-Aware Outfit Recommendation using Generative Adversarial Networks	Zhang et al.	2022	Generated style-consistent outfits by learning latent style distributions from user data.	Combined CNNs for feature extraction with GANs to synthesize complementary clothing items.	Computationally expensive and may generate unrealistic combinations if training data is limited.

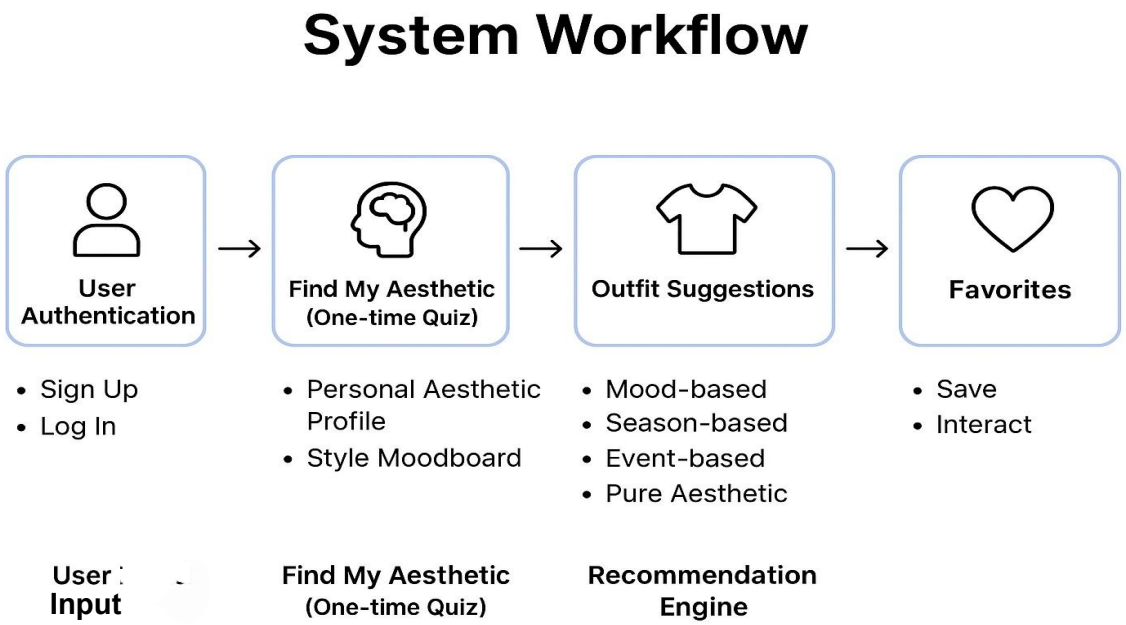
Limitations of existing systems

- Inability to model Abstract factors(Mood and Vibe).
- Over reliance on purchase and commercial Intent.
- Difficulty in Handling Dynamic context.
- Struggle with outfit Harmony.

Problem statement

- Current fashion recommendation systems face significant challenges in delivering Personalized and context-aware suggestions.They struggle to model abstract factors such as mood and vibe, often relying excessively on purchase history and commercial intent rather than genuine user preferences. Additionally, these systems have difficulty adapting to dynamic contexts,such as changing environment or occasions, and frequently fail to ensure outfit harmony. AS a result, users experience limites satisfaction and reduced trust in the recommendations provided.

System Design



Technologies and methodologies

- Python (FastAPI, ML Service): Powers the machine learning microservice handling model inference and data processing.

- Node.js (Backend API): Manages business logic, authentication, and communication between the frontend and ML service.

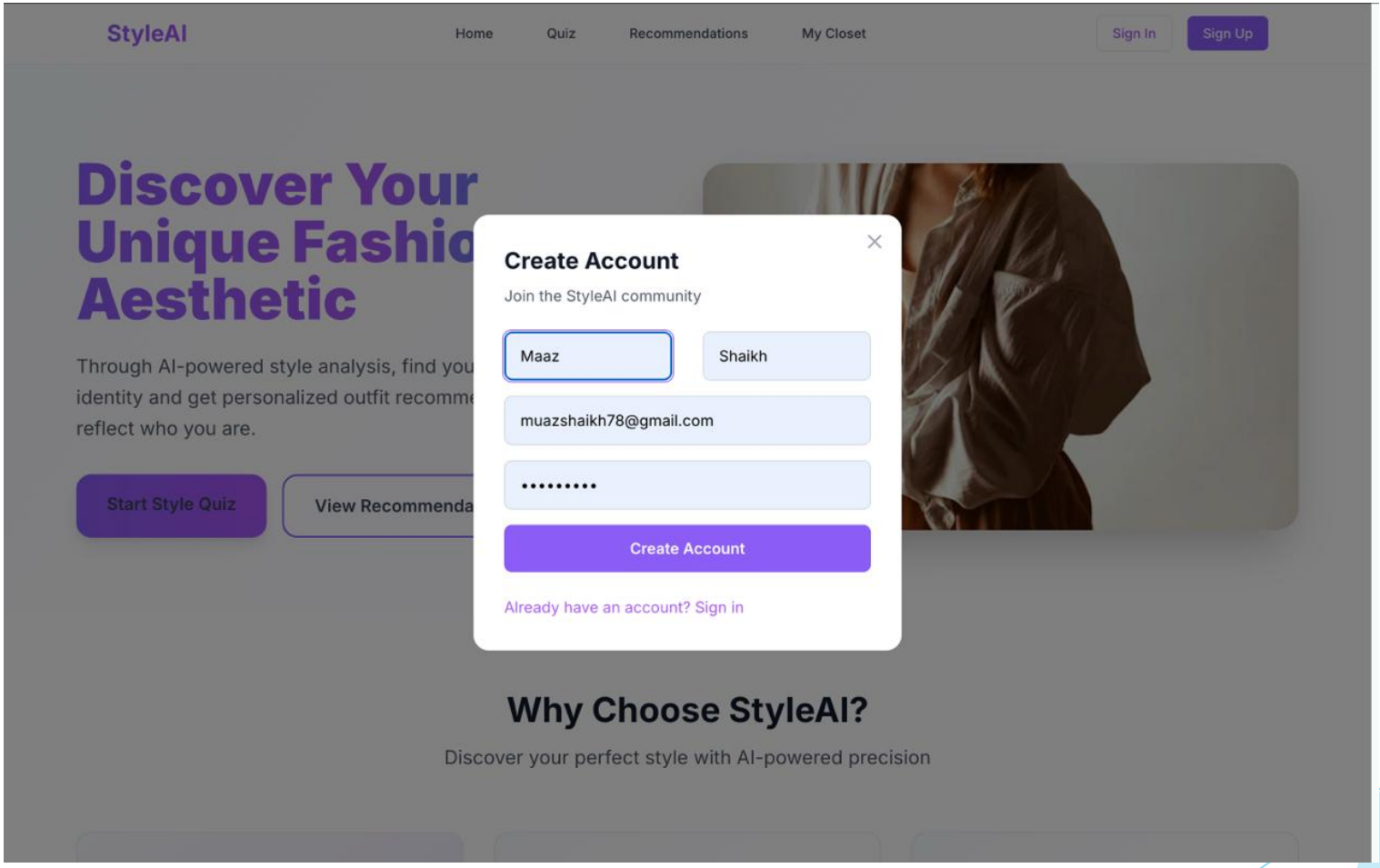
- React (Frontend/UI): Delivers an interactive, modern user experience with real-time outfit suggestions and personalized results.

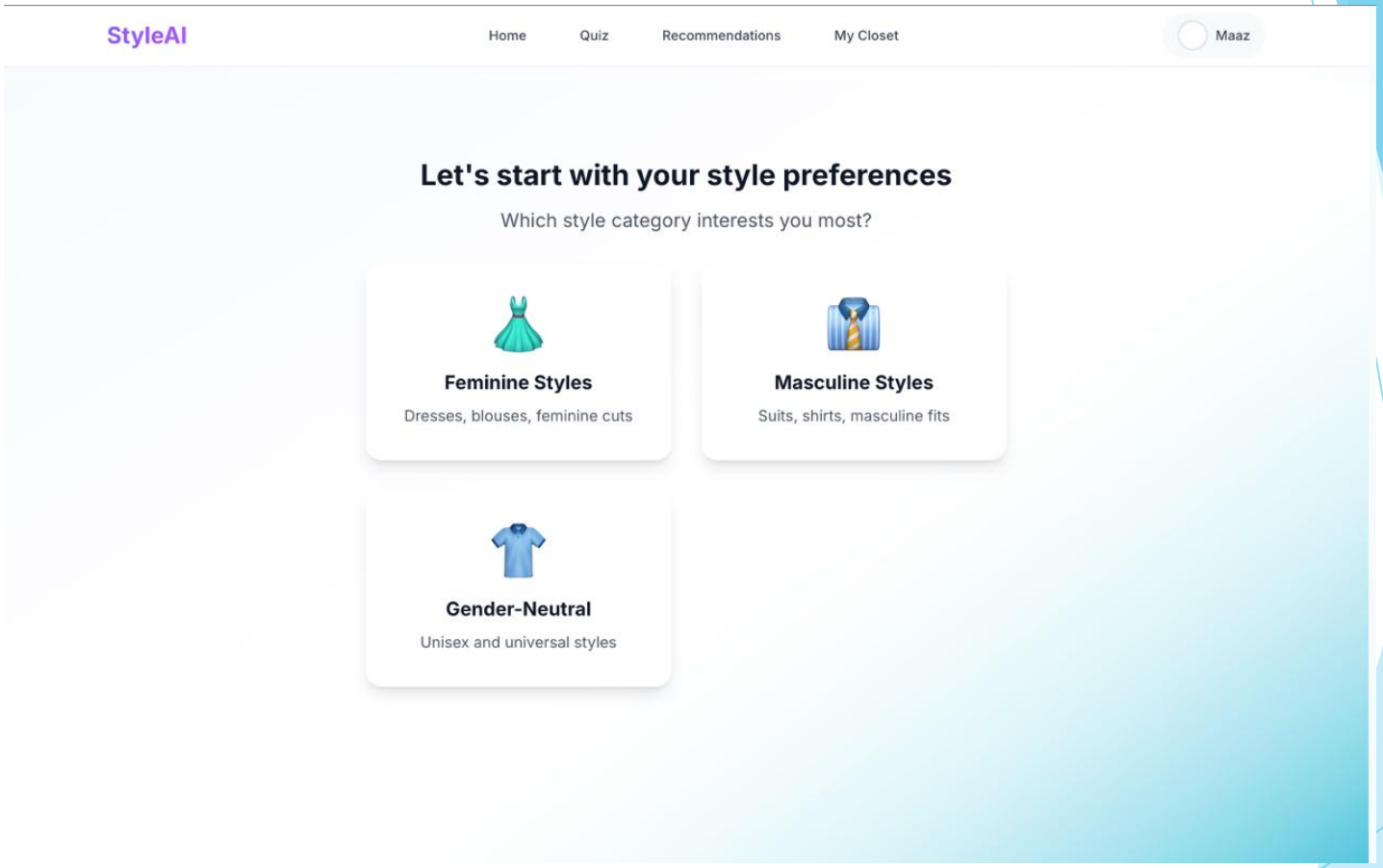
- PostgreSQL (Database): Stores product catalogs, user profiles, and recommendation data efficiently and securely.

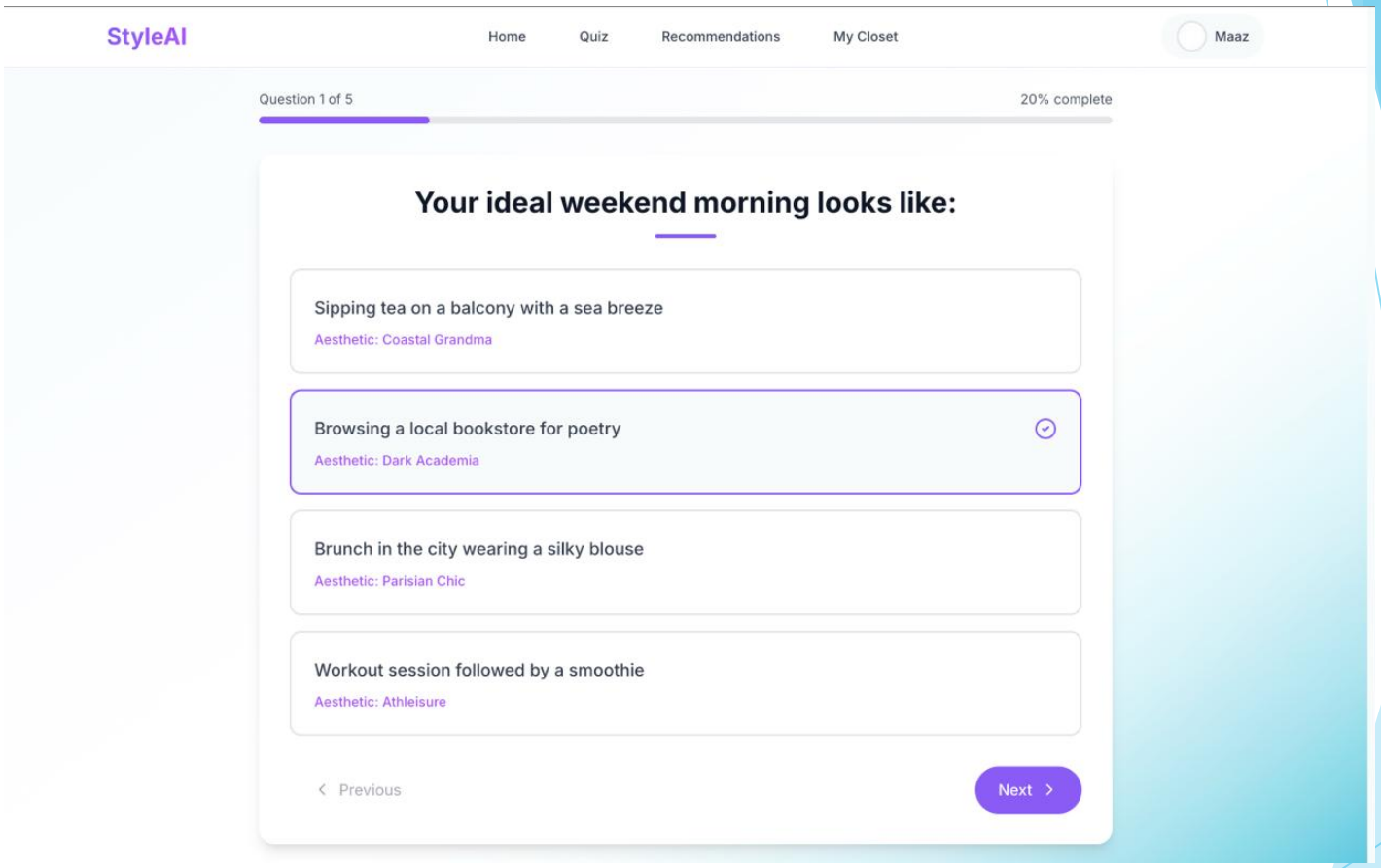
- Scikit-learn, PyTorch: Used for building, training, and evaluating models for outfit classification and visual similarity detection.

- OpenAI GPT: Enhances recommendations with natural-language product descriptions, captions, and conversational insights.

Implementation




StyleAI
Home
Quiz
Recommendations
My Closet
Maaz
Let's start with your style preferences
Which style category interests you most?
Feminine Styles
Dresses, blouses, feminine cuts
Masculine Styles
Suits, shirts, masculine fits
Gender-Neutral
Unisex and universal styles


StyleAI
Home
Quiz
Recommendations
My Closet
Maaz
Question 1 of 5
20% complete
Your ideal weekend morning looks like:
Sipping tea on a balcony with a sea breeze
Aesthetic: Coastal Grandma
Browsing a local bookstore for poetry
Aesthetic: Dark Academia
Brunch in the city wearing a silky blouse
Aesthetic: Parisian Chic
Workout session followed by a smoothie
Aesthetic: Athleisure
Previous
Next

StyleAI

Home Quiz Recommendations My Closet Maaz

Quiksilver Men Blue Sweatshirt

Apparel • male

sweatshirts topwear blue +2 more

Blue

Like Save

United Colors of Benetton Men Check Purple Shirts

Apparel • male

shirts topwear purple +2 more

Purple

Like Save

Flying Machine Men Printed White T-shirt

Apparel • male

tshirts topwear white +2 more

White

Like Save

Gas Men Europa Blue Shoes

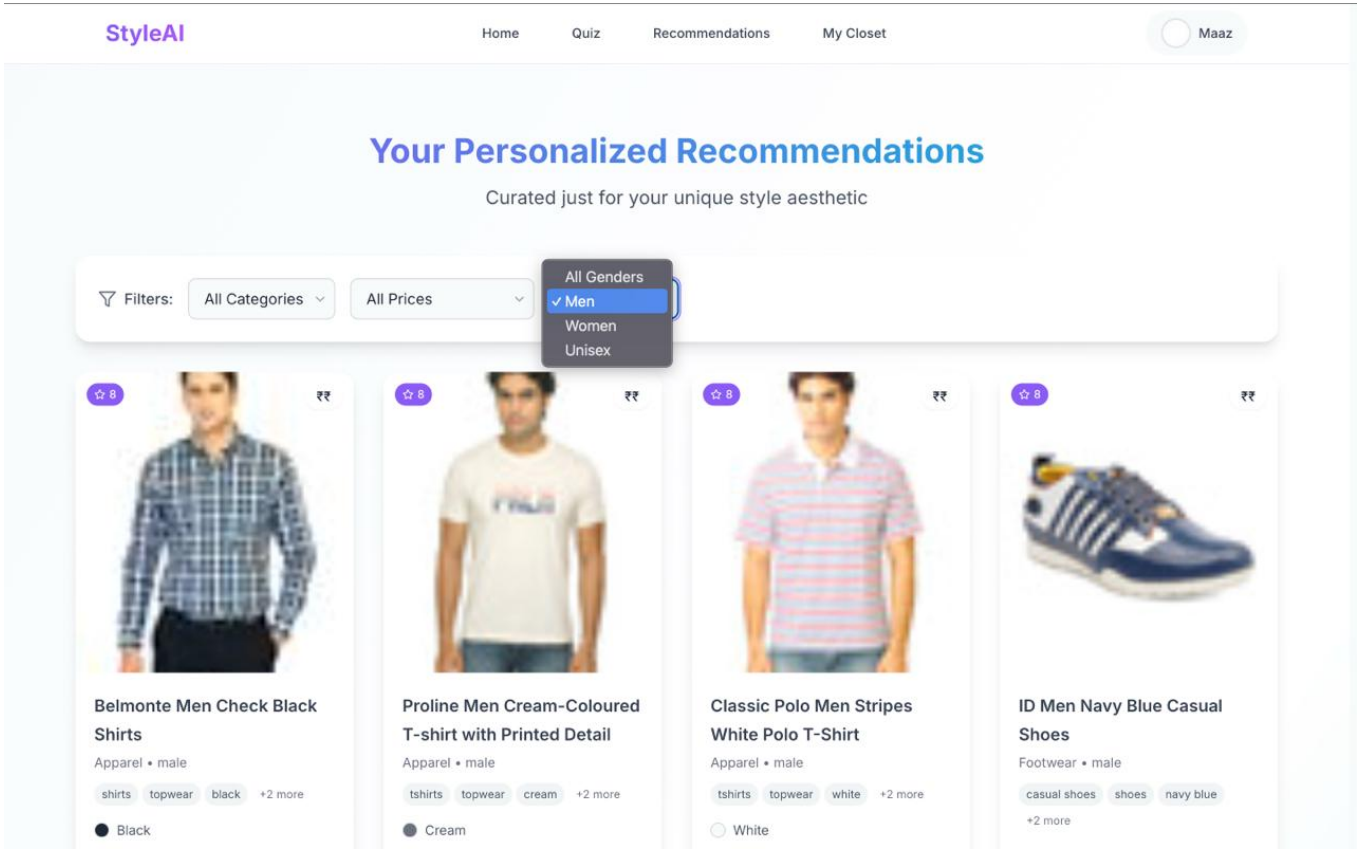
Footwear • male

casual shoes shoes blue +2 more

Blue

Like Save

View All Recommendations Retake Quiz


StyleAI
Home
Quiz
Recommendations
My Closet
Maaz
Your Personalized Recommendations
Curated just for your unique style aesthetic
Filters:
All Categories
All Prices
All Genders
Men
Women
Unisex
Belmonte Men Check Black Shirts
Apparel • male
shirts topwear black +2 more
Black
Proline Men Cream-Coloured T-shirt with Printed Detail
Apparel • male
tshirts topwear cream +2 more
Cream
Classic Polo Men Stripes White Polo T-Shirt
Apparel • male
tshirts topwear white +2 more
White
ID Men Navy Blue Casual Shoes
Footwear • male
casual shoes shoes navy blue
+2 more

StyleAI

Home Quiz Recommendations My Closet

Maaz

My Virtual Closet

Your saved outfits and favorite fashion pieces

Search your closet...

All Occasions

3 items

Proline Men Cream-Coloured T-shirt with Printed Detail

Saved outfit: Proline Men Cream-Coloured T-shirt with Printed Detail

tshirts topwear cream

Apparel 27/10/2025

John Miller Men Check Blue Shirt

Saved outfit: John Miller Men Check Blue Shirt

shirts topwear blue

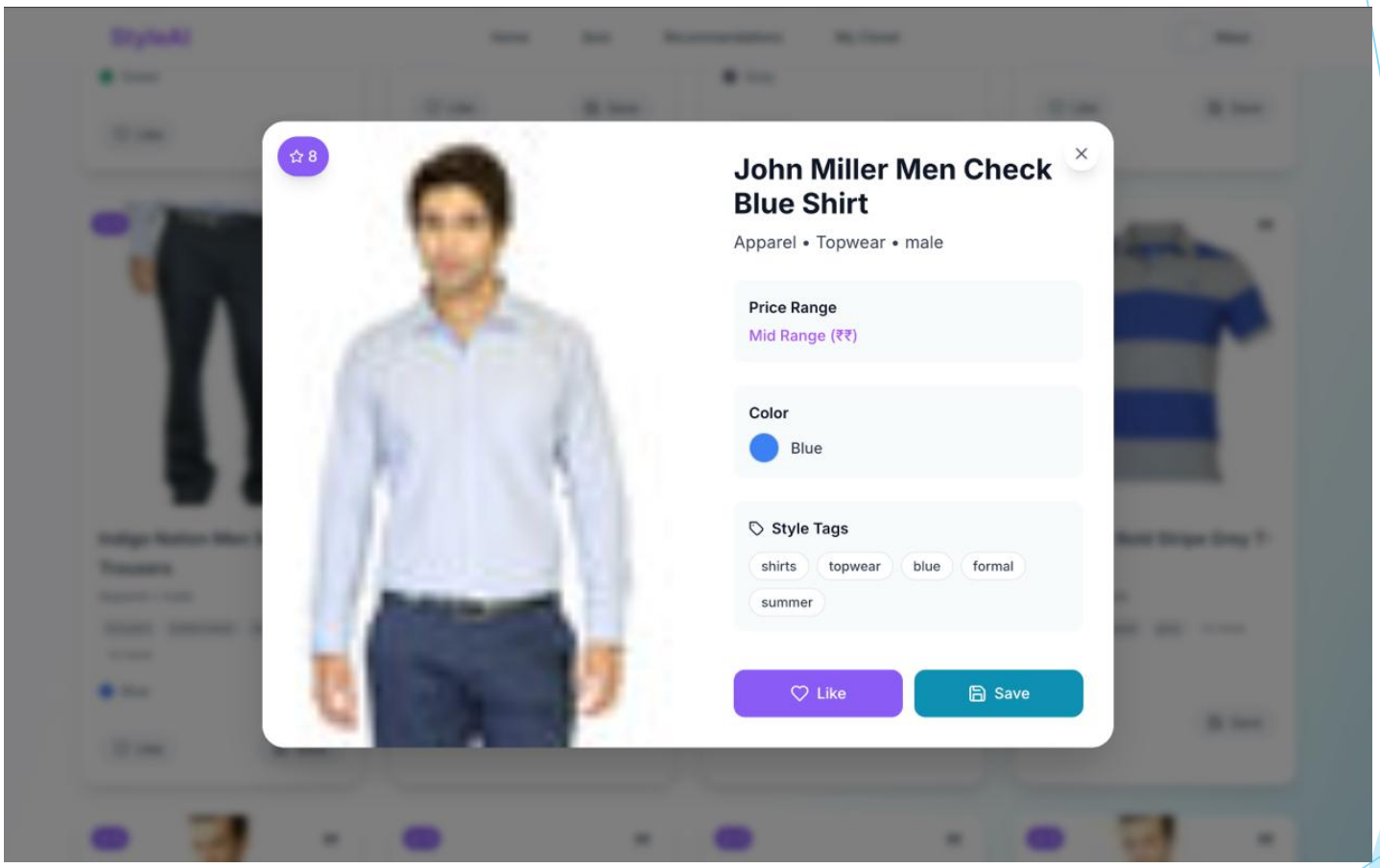
Apparel 27/10/2025

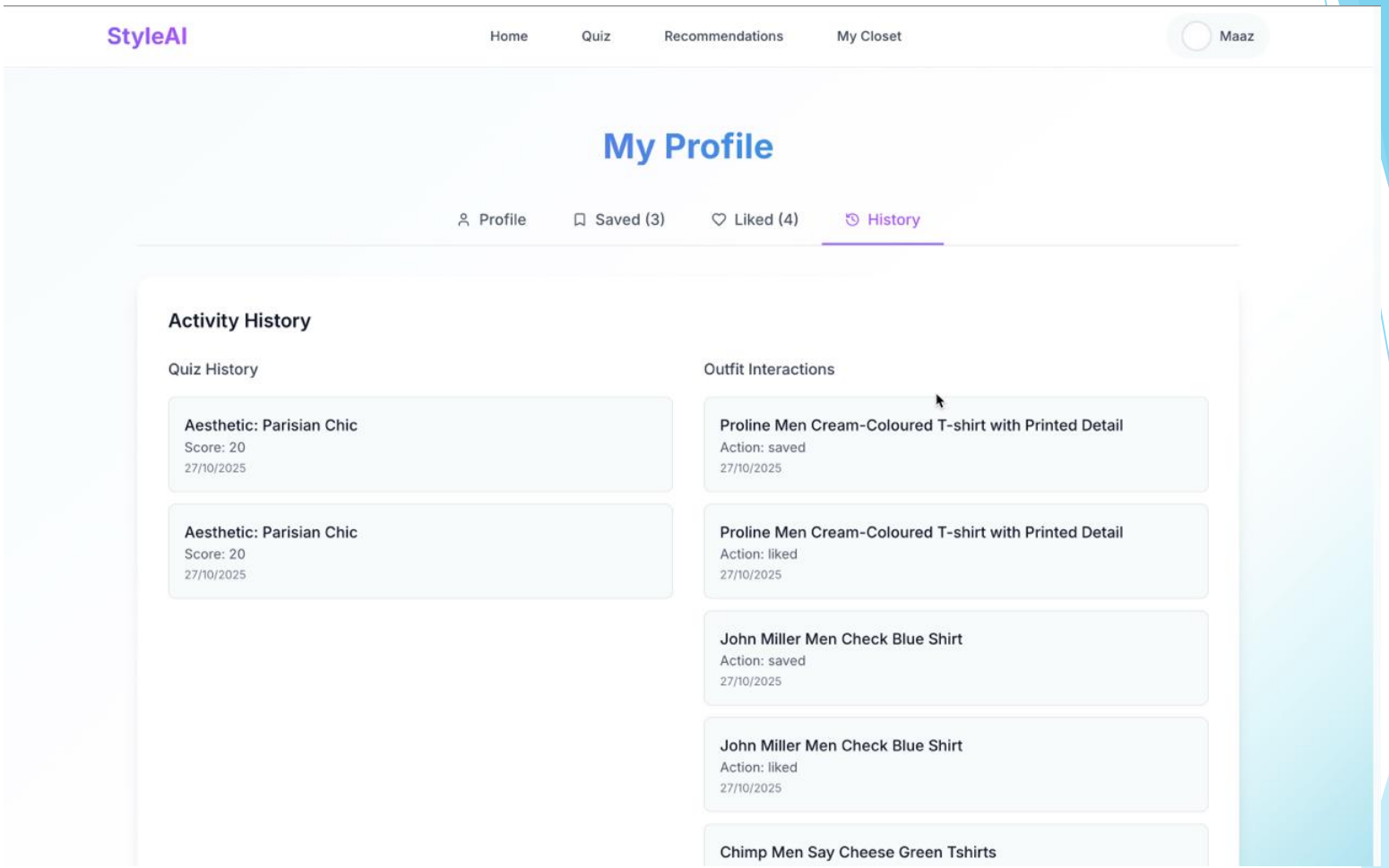
Chimp Men Say Cheese Green Tshirts

Saved outfit: Chimp Men Say Cheese Green Tshirts

tshirts topwear green

Apparel 27/10/2025


8
John Miller Men Check Blue Shirt
Apparel • Topwear • male
Price Range
Mid Range (₹₹)
Color
Blue
Style Tags
shirts
topwear
blue
formal
summer
Like
Save


StyleAI
Home
Quiz
Recommendations
My Closet
Maaz
My Profile
Profile
Saved (3)
Liked (4)
History
Activity History
Quiz History
Aesthetic: Parisian Chic
Score: 20
27/10/2025
Aesthetic: Parisian Chic
Score: 20
27/10/2025
Outfit Interactions
Proline Men Cream-Coloured T-shirt with Printed Detail
Action: saved
27/10/2025
Proline Men Cream-Coloured T-shirt with Printed Detail
Action: liked
27/10/2025
John Miller Men Check Blue Shirt
Action: saved
27/10/2025
John Miller Men Check Blue Shirt
Action: liked
27/10/2025
Chimp Men Say Cheese Green Tshirts

Conclusion

- The system offers personalized outfit suggestions that go beyond trends.
- Helps users express their authentic aesthetic and identity.
- Reduces decision fatigue with daily outfit ideas.
- Can evolve with brand partnerships, AI-generated style boards, and virtual try-ons.
- Future potential to become a personal AI stylist for every user.

References

[1] Meng et al., 'Visual Recommendation with User Intent for E-Commerce', 2019.

[2] Chen et al., 'Personalized Outfit Recommendation with Self-Attentive Modulation', 2020.

[3] Patel & Singh, 'Context-Aware Personalized Fashion Recommendation', 2023.

[4] Liu et al., 'Fashion Outfit Recommendation with Graph Neural Networks', 2021.

[5] Zhang et al., 'Style-Aware Outfit Recommendation using Generative Adversarial Networks', 2022.

Thank You...!!