A Mini Project Synopsis on

AI Outfit Recommendation App

T.E. – Computer Science and Engineering-Data Science

Submitted By

Sanika Shelke	**21107066**
Veena Sharma	**21107048**
Vineet Mhatre	**22207009**
Kashish Yadav	**21107026**

Under The Guidance Of

Prof. Sarala Mary

DEPARTMENT OF CSE-DATA SCIENCE

A.P.SHAH INSTITUTE OF TECHNOLOGY

G.B. Road, Kasarvadavali, Thane (W), Mumbai-400615

UNIVERSITY OF MUMBAI

Academic Year : 2022-23

CERTIFICATE

This to certify that the Mini Project report on AI Fitness Trainer has been submitted by Sanika Shelke (21107066) , Vineet Mhatre (22207009) , Veena Sharma (21107048) and Kashish Yadav(21107026) who are a Bonafede students of A. P. Shah Institute of Technology, Thane, Mumbai, as a partial fulfilment of the requirement for the degree in Computer Science and Engineering(Data Science), during the academic year 2023-2024 in the satisfactory manner as per the curriculum laid down by University of Mumbai.

Prof. Sarala Mary
Guide

Prof. Anagha Aher
Head of the Department of CSE(Data Science)

Dr. Uttam D.Kolekar
Principal

External Examiner(s)
1.
2.

Place: A. P. Shah Institute of Technology, Thane
Date:

TABLE OF CONTENTS

Chapter 1

Introduction

AI Outfit Recommendation App, a revolutionary solution that seamlessly fuses fashion and technology to elevate your everyday clothing choices. We understand the daily challenge of picking the perfect outfit, and our app is here to simplify that process. Our cutting-edge AI system leverages your unique style preferences, current weather conditions, and even upcoming events to curate personalized outfit suggestions. Gone are the days of spending valuable time staring at your wardrobe – our app takes the guesswork out of fashion, allowing you to effortlessly look your best, no matter the occasion.

In a world where fashion and technology collide, our AI Outfit Recommendation App is the pinnacle of this union. It's the solution you've been waiting for, combining the best of both worlds to enhance your daily life. The app understands your unique style, considers the local weather, and even suggests outfits for various occasions. Whether you're dressing for a casual day out, a formal event, or even a last-minute date night, our AI-powered app has you covered. It's the ultimate fashion companion that empowers you to make stylish choices effortlessly, allowing you to showcase your personality through your clothing. Make every day a fashion statement with our AI Outfit Recommendation App, because looking good has never been this easy or enjoyable.

1.1 Purpose

This AI Outfit Recommendation website serves a dual-purpose of enhancing the fashion experience for users and providing valuable insights for fashion. It offers personalized fashion suggestions based on their individual preferences, body type and lifestyle. The website can curate outfit recommendations that suit various occasions and trends. This not only simplifies the process of selecting daily outfits but also boosts users' confidence and style, ultimately improving their overall fashion experience. The purpose of an AI Outfit Recommendation website is to promote sustainability in the fashion industry by suggesting outfit combinations that incorporate existing wardrobe items, reducing the need for frequently clothing purchases and contributing to eco-friendly fashion practices.

1.2 Objectives

The objectives of an AI outfit recommendation website are multifaceted, aiming to serve both users and fashion businesses effectively. The website seeks to enhance the user experience by providing personalized fashion suggestions tailored to individual preferences, body types, and occasions. This objective aims to simplify the process of outfit selection, saving users time and effort while helping them feel more confident and stylish.

The website aims to foster sustainability in the fashion industry by encouraging users to make the most of their existing wardrobe items. By suggesting outfit combinations that incorporate what users already own, the website promotes responsible consumption and reduces fashion-related waste. For fashion businesses, the website's objectives include boosting customer engagement through personalized shopping experiences and increasing sales through effective upselling and crossselling. Additionally, it aims to provide valuable data insights derived from user interactions, helping brands make data-driven decisions about inventory management, marketing strategies, and product development.

The main objective of an AI outfit recommendation website encompass enhancing the user experience, promoting sustainability, and empowering fashion businesses with data-driven insights for growth.

1.3 Scope

The scope of the AI Outfit Recommendation App is designed to revolutionize the way individuals approach fashion and outfit selection. This innovative system goes beyond the conventional understanding of fashion recommendations, delving into personalized styling and clothing choices tailored to each user's unique interests, skills, and values. Much like a virtual fashion consultant, the app is geared towards offering an interactive and engaging experience that guides users towards fashion choices that align with their preferences. In addition to enhancing individual fashion sense, this project aims to create a user-friendly interface that fosters understanding and appreciation of AI technology's potential in daily fashion decisions.

Chapter 2

Problem Definition

The emergence of AI outfit recommendation systems is driven by a fundamental problem in the world of fashion and personal styling. Individuals often face the daunting task of sifting through their clothing options to put together suitable and stylish outfits for various occasions. This process can be time-consuming, overwhelming, and sometimes even frustrating, particularly when considering factors like changing fashion trends, seasonal variations, and personal style preferences. Additionally, people's busy lives may limit their ability to stay updated on the latest fashion trends or effectively utilize the full potential of their existing wardrobe. AI outfit recommendation systems aim to address these challenges by leveraging artificial intelligence and machine learning to offer personalized, context-aware, and fashionforward outfit suggestions. In doing so, they alleviate the burden of outfit selection, simplify the decision-making process, and empower individuals to effortlessly express their style while staying in vogue, ultimately enhancing the overall fashion experience

An AI outfit recommendation website revolves around creating a comprehensive digital platform that seamlessly incorporates artificial intelligence and machine learning technologies. This platform aims to help users make informed and stylish clothing choices by first building personalized user profiles, taking into account factors such as style preferences, body type, and clothing size. It then utilizes machine learning algorithms to provide tailored outfit recommendations that align with each user's unique fashion inclinations. Contextual awareness plays a pivotal role, with the system factoring in variables like weather conditions, location, and event type to ensure that the suggested outfits are both fashionable and contextually appropriate.

Continuous monitoring and analysis of current fashion trends are essential components, ensuring that the recommendations remain up-to-date and in line with the latest styles. Users can integrate their existing wardrobe into the system, allowing the AI to intelligently incorporate these items into its recommendations, thereby reducing unnecessary clothing purchases. Additionally, the AI considers visual aesthetics, including color coordination, pattern matching, and overall visual harmony, to guarantee that the recommended outfits are visually appealing and wellcoordinated.

Chapter 3

Proposed System

To illustrate the practicality and benefits of the AI Outfit Recommendation App, we propose the creation of an engaging simulation or virtual experience that immerses users in the app's functionality. This online platform will guide users through the process of using the AI-driven recommendation system, similar to an interactive tutorial. Users will be prompted to answer a series of questions about their fashion preferences, style, weather considerations, and wardrobe contents. Based on their responses, the app will provide real-time outfit recommendations, allowing users to visualize how AI technology can assist them in making fashion choices that align with their personal style and the day's weather conditions. This immersive experience will not only showcase the app's capabilities but also empower users to make informed fashion decisions, enhancing their understanding of how AI can be a valuable tool in their daily lives.

To ensure technical feasibility, we have thoroughly analyzed the functionality required for the AI Outfit Recommendation App, as specified in the System Requirement Specification. We assessed if each function can be implemented efficiently, taking into account the processing power and capabilities of modern devices. We conducted performance studies to ensure that the app can handle a large user base and provide quick and accurate outfit recommendations.

Operational Feasibility: The AI Outfit Recommendation App is designed to be fully graphical user interface (GUI)-based, making it highly user-friendly. The input and interaction elements are intuitive and self-explanatory, ensuring that users of all technical backgrounds can easily navigate the system. Proper training and on boarding sessions have been conducted for users to familiarize them with the app's features and functionalities. This ensures that users feel comfortable and confident while using the system, enhancing its operational feasibility

3.1 Features and Functionalities

. Here are some of the key features and functionalities commonly found in AI Outfit Recommendation app:

- Recommends outfits that incorporate existing wardrobe items to promote ecofriendly fashion choices.
- Provides insights into current fashion trends and suggests trendy outfit options.
- Offers tailored outfit suggestions based on user preferences, style, and body type.
- User can give feedback and ratings on the basis of recommended outfits
- Users can create a profile by specifying their fashion preferences, including style, colors, and clothing types. This profile serves as the basis for outfit recommendations.
- Users can select the occasion for which they need an outfit, such as work, a date, a party, or casual wear. The app tailors recommendations to match the chosen occasion.
- The app employs machine learning algorithms to analyze user preferences, historical outfit choices, and fashion trends. It continuously refines its recommendations based on this data.

The AI Outfit Recommendation App is a sophisticated fashion tool that seamlessly blends the power of artificial intelligence with user-centric fashion expertise. Its core features and functionalities are designed to enhance the user's wardrobe selection process and provide personalized outfit recommendations. Users can create fashion profiles, manage their digital wardrobes, and receive weather-sensitive outfit suggestions based on real-time weather data. The app caters to various occasions, offering mix-and-match recommendations and staying up-to-date with the latest fashion trends. Users can rate and provide feedback on outfit suggestions, aiding the app's continuous learning process. Additionally, the app may provide shopping recommendations, styling tips, and social sharing options, making it a comprehensive solution for fashion enthusiasts. With multi-platform accessibility and a focus on user privacy, the AI Outfit Recommendation App simplifies the art of dressing stylishly, offering a seamless and enjoyable fashion experience

Chapter 4

Project Outcomes

The AI outfit recommendation app is designed to revolutionize the way people choose their clothing, making the process more convenient, personalized, and enjoyable. By utilizing cutting-edge artificial intelligence and machine learning technologies, this app offers a comprehensive solution to the common wardrobe related challenges people face daily. One of the primary outcomes of this innovative app is its ability to provide users with personalized outfit recommendations tailored to their individual preferences, body type, and the specific occasion or weather conditions. It takes into account a user's style preferences, past outfit choices, and even their local weather forecast to suggest outfits that are not only fashionable but also practical. This personalization ensures that users feel confident and comfortable in their chosen attire, reducing the hassle of deciding what to wear and boosting their self-esteem. Another crucial outcome of the AI outfit recommendation app is its potential to promote sustainability and responsible consumption. By helping users mix and match their existing clothing items in creative ways, the app encourages them to make the most of their current wardrobe and reduce the urge to constantly buy new clothes.

This can contribute to a more sustainable and environmentally-friendly approach to fashion, reducing the negative impact of fast fashion on our planet. Additionally, the app can become a valuable tool for fashion retailers and brands. It can analyze user data (while respecting privacy regulations and user consent) to gain insights into consumer preferences and purchasing patterns. This data can be used to tailor marketing campaigns, design new clothing lines, and optimize inventory management. By bridging the gap between consumers and fashion businesses, the app can drive more efficient and customer-centric operations in the fashion industry Furthermore, the AI outfit recommendation app can foster a sense of community among its users. It allows them to share their outfits, style tips, and experiences with others in the app's social network, fostering a sense of belonging and connectedness.

Users can also follow fashion influencers and experts, gaining inspiration and advice for their personal style journeys. Ultimately, the AI outfit recommendation app seeks to streamline the fashion experience, empowering users to make informed and stylish choices while reducing the environmental footprint of the fashion industry. It offers a seamless blend of fashion and technology, revolutionizing the way people approach their daily clothing decisions, all while contributing to a more sustainable and interconnected fashion ecosystem The AI outfit recommendation app is poised to revolutionize the fashion landscape, offering a plethora of impactful outcomes.

Foremost, it personalizes fashion choices by considering individual preferences, body types, and the specific context, enabling users to confidently select outfits that match their style and the weather, boosting self-esteem and convenience. This tailored approach encourages more responsible consumption and sustainable fashion choices by suggesting creative combinations from the user's existing wardrobe, thus reducing the impulse to frequently buy new clothes. In the broader context, the app holds potential for transforming the fashion industry, as it provides valuable insights into consumer behavior and preferences. Brands and retailers can use this data to optimize inventory management, reduce waste, and align their offerings with eco-conscious trends. Simultaneously, the app fosters a sense of community, where users share their outfits and tips, creating a vibrant network of fashion enthusiasts. Financially, it helps users save money through more mindful wardrobe management. It also contributes to personal style evolution, empowering users to explore and refine their fashion identity ethical and eco-friendly fashion choices.

The project outcome of the AI Outfit Recommendation App is designed to bring about a significant transformation in the way individuals plan and choose their daily attire. The app's core objectives are to simplify the outfit selection process and enhance the user's fashion choices. As a result, users benefit from a range of advantages, including a reduction in the time and effort traditionally required for dressing. The app achieves this by providing personalized outfit recommendations based on the user's unique fashion preferences, style, and the current weather conditions. Users experience a newfound level of confidence in their fashion choices, as the app ensures their outfits not only reflect their personal style but are also suitable for the weather.

Chapter 5

Software Requirements

The AI Outfit Recommendation App is a sophisticated software solution designed to provide users with a highly personalized and efficient outfit selection experience. This application relies on cutting-edge artificial intelligence technology to analyze user profiles, considering factors such as style preferences, body type, and specific occasions or events for which outfits are needed. Users can conveniently create and manage their profiles, inputting details that enhance the system's recommendations. The AI algorithms enable the app to generate outfit suggestions promptly, taking into account user feedback to continually refine and personalize recommendations. Additionally, the app offers search and filtering options to aid users in finding specific items, and it may even provide a virtual try-on feature for augmented reality outfit previews. Seamless integration with e-commerce platforms allows for straightforward purchasing of recommended items.

The system is expected to deliver swift response times, scalable performance, and high availability while adhering to stringent data privacy and security standards. With periodic AI model training and ongoing user feedback assessments, the AI Outfit Recommendation App aims to become an indispensable tool for users seeking tailored and fashion-forward outfit advice. The app enables users to like or dislike recommendations, contributing to continuous learning and improvement in the outfits it suggests. It also provides filters for refined searches and may offer a virtual try-on feature, allowing users to virtually "try on" outfits through augmented reality. Furthermore, the app integrates seamlessly with e-commerce platforms for convenient shopping. It upholds robust performance standards, offering rapid response times, scalability to accommodate a growing user base, and 24/7 availability.

Table 1: System Requirements

Name of the component	Specification
Operating System	Windows 10
Language	Python
Database	MySQL Workbench 8.0 CE
Python IDE	PyCharm Community Edition 2023.1.3

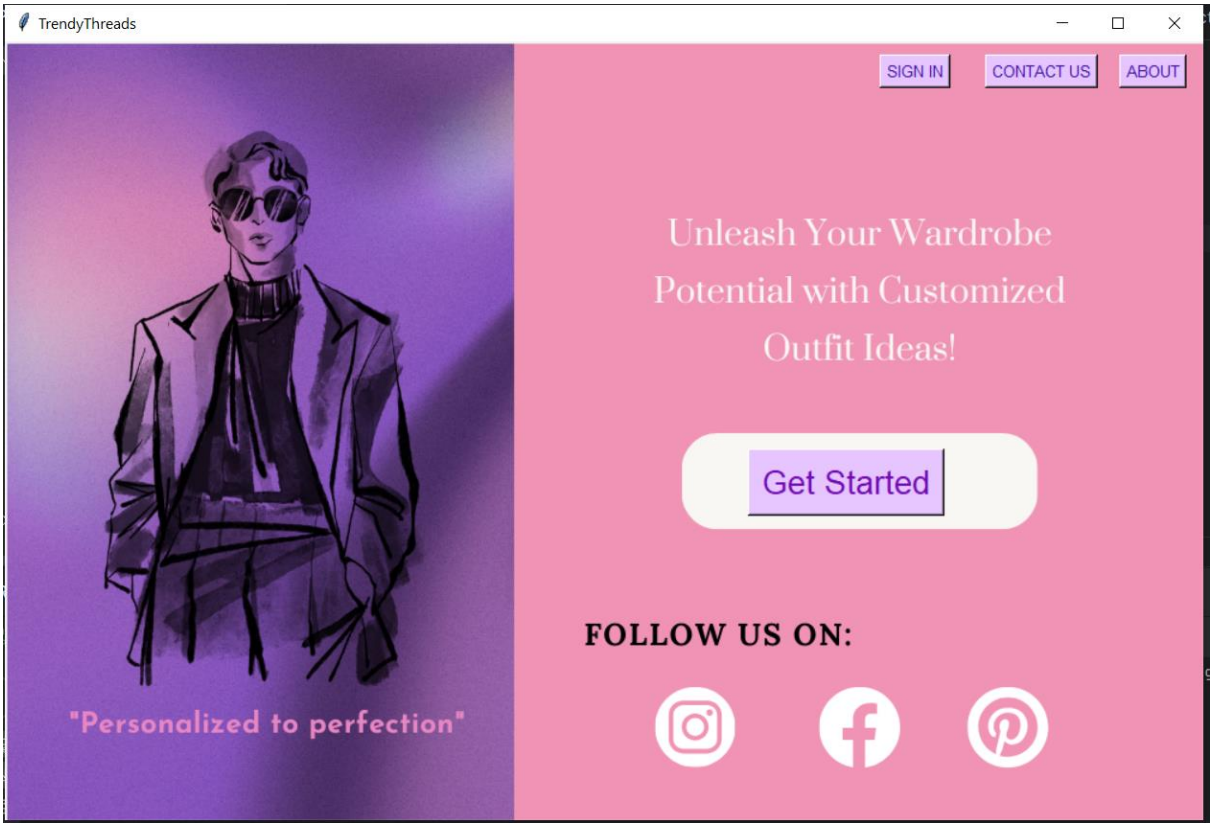
Chapter 6

Project Design

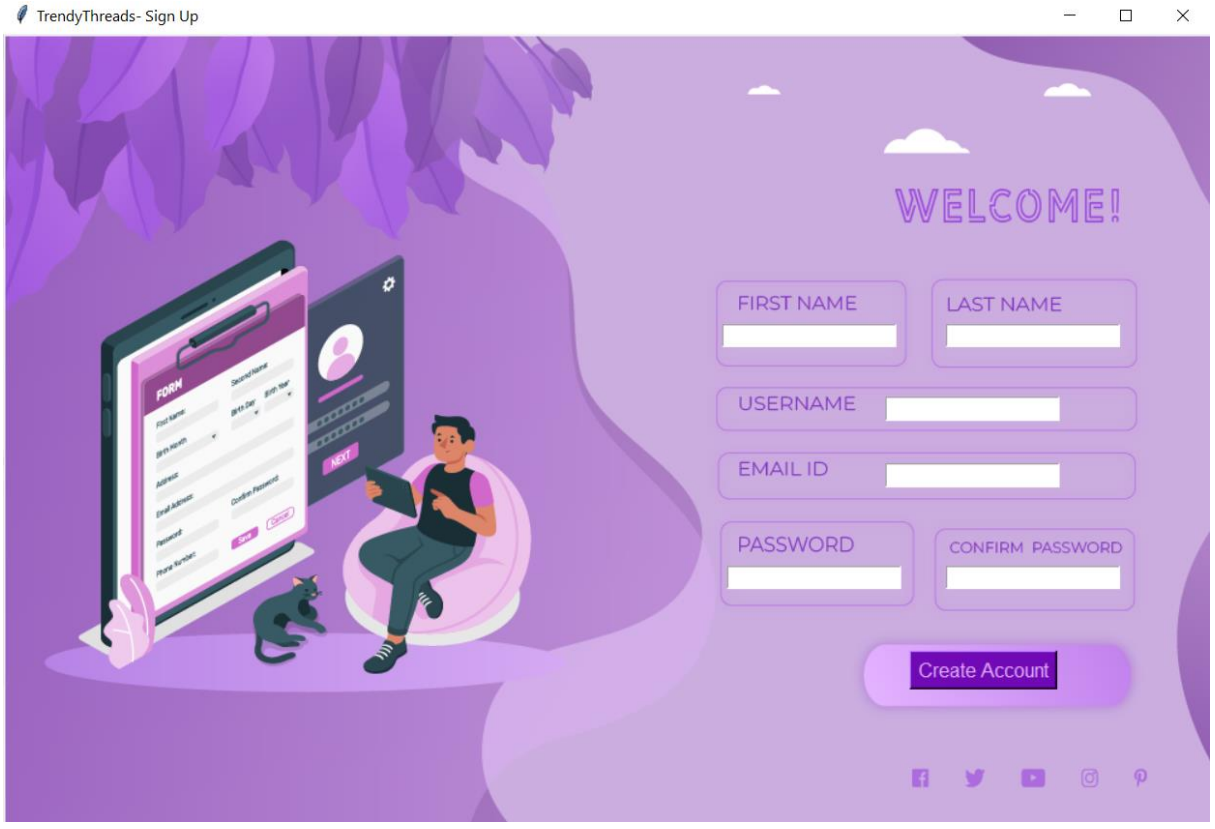
The project design for an AI Outfit Recommendation App involves a comprehensive architecture that comprises multiple key components. The application's user interface must be intuitive, allowing users to create and manage profiles, search for outfits, and make seamless purchases. The core of the app is the AI Recommendation Engine, which utilizes machine learning and data analysis to provide personalized outfit suggestions based on user profiles and preferences. The system should maintain a robust database for storing user data, clothing items, and historical interactions. To enhance user experience, optional features like virtual try on using augmented reality may be integrated. Efficient search and filtering options are crucial for helping users find specific items.

Furthermore, e-commerce integration with external platforms should be seamless for users to purchase recommended clothing. Security measures are paramount to protect user data and ensure compliance with data privacy regulations. Continuous performance optimization, user feedback collection, and scalability planning are essential components of the project. Rigorous testing, deployment to app stores, and post launch maintenance, including AI model retraining and security updates, round out the project design, aiming to provide users with a valuable and personalized outfit recommendation experience.

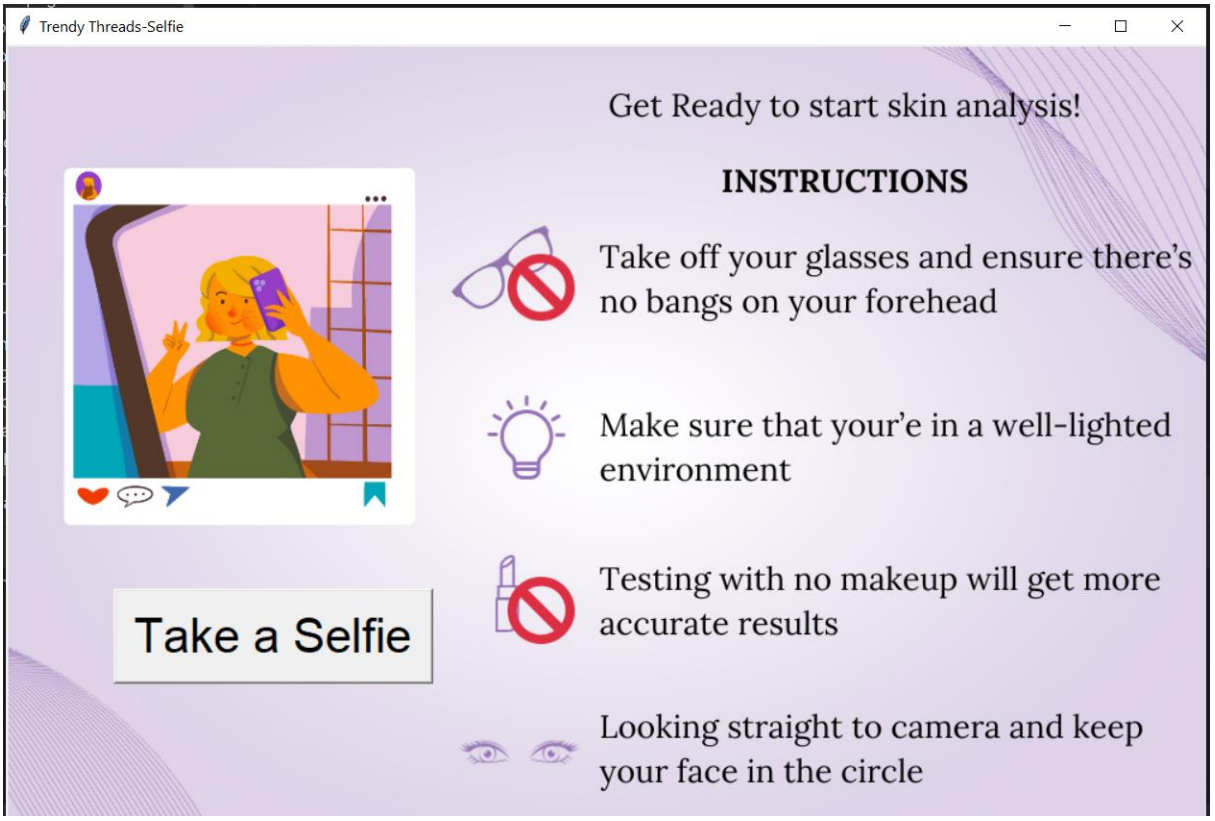
The project will be done in four phases. At the first level, the user is supposed to fill in the information given on the Login page and then the user is supposed to log in with their credentials. At the second level, the system offers an assessment to the user which is designed in a way that will help them determine what field of engineering is best suited to their respective abilities. In the third phase, the system will provide the user, with the top 5 available courses based on the outcome of the assessment which is paid and unpaid. All of the suggested courses will have certifications. The user will also get links to similar courses that can be availed by

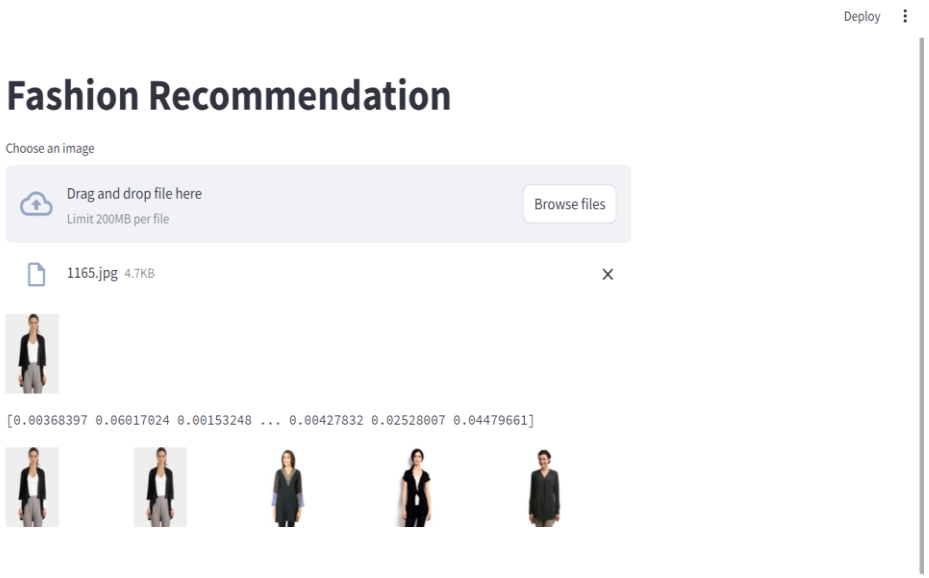


1.Home page



2. Sign Up page


Trendy Threads-Selfie
Get Ready to start skin analysis!
INSTRUCTIONS
Take off your glasses and ensure there's no bangs on your forehead
Make sure that your'e in a well-lighted environment
Testing with no makeup will get more accurate results
Looking straight to camera and keep your face in the circle
Take a Selfie


Deploy
Fashion Recommendation
Choose an image
Drag and drop file here
Limit 200MB per file
Browse files
1165.jpg 4.7KB
[0.00368397 0.06017024 0.00153248 ... 0.00427832 0.02528007 0.04479661]

Chapter 7

Project Scheduling

The project schedule comprises a comprehensive list of milestones, tasks, and deliverables, serving as a roadmap for the project's execution. It outlines the timeline for task completion, allocation of resources, and dependencies between activities.

Table 2: Timeline Chart

Sr. No	**Group Member**	**Time Duration**	**Work to be done**
1	Sanika Shelke Veena Sharma Vineet Mhatre Kashish Yadav	**1st week of August**	Group formation and Topic finalization. Identifying the scope and objectives of the Mini Project.
			Discussing the project topic with the help of a paper prototype.
		3rd week of August	Identifying the functionalities of the Mini Project.
			Designing the Graphical User Interface (GUI).
2	Sanika Shelke Vineet Mhatre	**2nd week of September**	Database Design
3	Veena Sharma Kashish Yadav	**1st week of October**	Database Connectivity of all modules.
4	Veena Sharma Sanika Shelke Vineet Mhatre Kashish Yadav	**Last week of October**	Integration of all modules and Report Writing.

GANTT CHART TEMPLATE

Smartsheet Tip → A Gantt chart's visual timeline allows you to see details about each task as well as project dependencies.

PROJECT TITLE AI OUTFIT RECOMMENDATIO
PROJECT GUIDE PROF. SARALA MARY

INSTITUTE NAME AP SHAH INSTITUTE OF TECHNOLOGY
DEPARTMENT NAME CSE DATA SCIENCE
DATE 10/26/2023

PHASE ONE

WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION (Weeks)	PERCENTAGE OF TASK COMPLETE
1	**Project Conception and Initiation**					
1.1	Group formation and Topic finalization. Identifying the scope and objectives of the Mini Project	Veena Sharma, Sunita Sheke, Vineet Mhatre, Kailash Yadav	7/11/2023	7/25/2023	2	100%
1.2	Identifying the functionalities of the Mini Project	Veena Sharma, Sunita Sheke, Vineet Mhatre, Kailash Yadav	7/25/2023	8/1/2023	1	100%
1.3	Discussing the project topic with the help of paper passing pic.	Sunita Sheke, Veena Sharma	8/1/2023	8/8/2023	1	100%
1.4	Designing the Graphical User Interface(GUI)	Sunita Sheke, Vineet Mhatre	8/8/2023	8/31/2023	3	100%
1.5	Presentation I	Sunita Sheke, Veena Sharma, Vineet Mhatre, Kailash Yadav	9/13/2023	9/13/2023	1	100%
2	**Project Design and Implementation**					
2.1	Database Design	Sunita Sheke, Veena Sharma	9/13/2023	9/21/2023	1	100%
2.2	Database Connectivity of all modules	Veena Sharma, Sunita Sheke,	9/21/2023	9/28/2023	1	100%
2.3	Integration of all modules and Report Writing	Sunita Sheke, Veena Sharma, Vineet Mhatre, Kailash Yadav	9/28/2023	10/4/2023	1	100%
2.4	Presentation II	Veena Sharma, Sunita Sheke, Vineet Mhatre, Kailash Yadav	10/26/2023	10/26/2023	2	100%

Figure: Gantt Chart Of AI Outfit Recommendation

To visualize this schedule, a Gantt chart is employed, providing a graphical representation of task durations, start and finish dates, and interactivity. Additionally, Gantt charts help illustrate the project's work breakdown structure and the relationships between activities, ensuring effective project management and progress tracking.

Here in the above figure , the rows of the chart contain the task titles such as the project conception and initialization as well as the project design and implementation which in subdivision contains the group formation, topic finalizing, prototype, GUI designing, backend implementation etc. The columns contain the duration of the task completed, percentage of work completed, number of weeks required to complete a particular task, the specific dates, the team members who contributed towards the completion of tasks

The detailed explanation of the Gantt chart is explained below: The project conception and initiation task were executed by the month end around 26/10/23. The task of initiation included many more sub-tasks such as group formation and topic finalization which was performed during the 1 week of project initialization. The group formed included 4 members Veena Sharma, Sanika Shelke, Vineet Mhatre, Kashish Yadav and the finalized topic was AI Outfit Recommendation. Further, the upcoming week led to the task of identifying the scope and objectives of the mini-projects.

The next sub-task was to identify the functionalities of the project which was done by the two members Veena Sharma and Sanika Shelke in a span of one week from 25/07/23 to 01/08/23. The discussion of the project topic with the help of a paper prototype was completed with equal contribution from all the group members within one week from 01/08/23-08/08/23.

The next main task of Graphical User Interface (GUI) designing was completed by Sanika Shelke within 2 weeks from 08/08/23 to 31/08/23. The next week from 31/08/23 to 13/09/23 the members worked on the preparation of Presentation I.

The next task, database Design and connectivity of all modules were done by Veena Sharma and Sanika Shelke from 13/09/23 to 21/09/23. The integration of all modules and report writing was completed by Vineet Mhatre and Kashish Yadav from 21/09/23 to 28/09/23. The preparation of final presentation II work was equally shared by all the group members in the time of 2 weeks from 4/10/23 to 26/10/23.

Chapter 8

Conclusion

In conclusion, the development and implementation of an AI outfit recommendation app mark a significant advancement in the fashion industry. This innovative application leverages the power of artificial intelligence to provide personalized and tailored outfit suggestions to users. It takes into account individual style preferences, weather conditions, occasions, and even the latest fashion trends. As technology continues to evolve, AI outfit recommendation apps like this one are poised to revolutionize the way people shop for and put together their outfits.

The potential benefits of such an app are multifaceted. Users can expect to streamline their daily outfit selection process, saving time and reducing the stress associated with deciding what to wear. Moreover, this technology can empower individuals to explore new fashion horizons, experiment with different styles, and express their unique personalities through their clothing choices. It also has the potential to reduce fashion waste by promoting the re-use of existing clothing items rather than constantly buying new ones. Overall, the AI outfit recommendation app represents a promising step towards a more efficient, sustainable, and personalized approach to fashion.

However, it's important to recognize that while AI outfit recommendation apps offer valuable guidance, they should not replace individual creativity and personal style expression. Users should remain mindful of their unique tastes and preferences to ensure that they stay true to themselves while incorporating the AI-driven recommendations into their fashion choices. Additionally, data privacy and ethical considerations in the development and use of such apps must be carefully addressed to protect users' personal information and avoid perpetuating biases in fashion recommendations. As the technology continues to advance, the future of AI outfit recommendation apps holds great promise, provided it evolves responsibly and ethically.

Through this technology stack, we have successfully taken a holistic approach to tackling the problem, enabling individuals to embark on their fitness journeys with confidence. Our SQLite database facilitates efficient data management and retrieval, ensuring that users' profiles and workout data are securely and reliably stored.

REFERENCES

1.) https://www.cnet.com/tech/can-an-ai-powered-fitness-app-outperform-a-human-trainer/

2.) https://pypi.org/project/mediapipe/

3.) AI Fitness Trainers Are Here. Are They Useful? - The New York Times (nytimes.com)

4.) AI-powered personal trainer: the present and the future for fitness apps (palta.com)

5.) AI in fitness offers virtual trainers and customized wearables | TechTarget

6.) A Systematic Review of Nutrition Recommendation Systems: With Focus on Technical Aspects - PMC (nih.gov)

7.) Genetic Algorithm | Increase machine learning accuracy using GA | Genetic Algorithm in data science - YouTube

8.) Diet Recommendation System | Food Recommendation System | Langchain and Openai APIs - YouTube

9.) AI based Diet Recommendation System - YouTube

10.) Ultimate Diet and Workout Recommendation System | Virtual Doctor, Chatbot | ML, DL, NLP Powered - YouTube

11.) Building Yoga AI Trainer using Deep Learning | Pose Detector | Tensorflow Movenet | TensorflowJS - YouTube

12.) [Python AI Project] Don't Hire a Personal Trainer! Build Your Own with Machine Learning - YouTube

ACKNOWLEDGEMENT

This project would not have come to fruition without the invaluable help of our guide **Prof. Sarala Mary**. Expressing gratitude towards our HOD, **Prof. Anagha Aher**, and the Department of Computer Science and Engineering (Data Science) for providing us with the opportunity as well as the support required to pursue this project. We would also like to thank our teachers who gave us her valuable suggestions and ideas when we were in need of them. Lastly, we would like to thank our peers and colleagues for their helpful suggestions, discussions, and feedback, which enhanced the quality of our work.