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AI-BASED PERSONALIZED FITNESS AND WELLNESS COACH USING MACHINE LEARNING

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Abstract

Maintaining physical fitness is essential for a healthy lifestyle, yet many individuals lack access to personalized fitness guidance. Traditional fitness applications often provide generic workout plans that do not consider individual characteristics such as age, body parameters, and fitness goals. This research proposes an AI-based Personalized Fitness and Wellness Coach that generates customized workout recommendations using machine learning techniques. The system collects user inputs including age, height, weight, gender, and fitness goals through a web interface. These inputs are processed by a trained machine learning model to generate suitable workout and wellness recommendations. The system is implemented as a web application using Python Flask for backend processing and HTML, CSS and Bootstrap for the frontend interface.

Index Terms—Artificial Intelligence, Machine Learning, Fitness Recommendation System, Personalized Healthcare.

1. Introduction

Maintaining physical fitness is important for leading a healthy life. However, many individuals struggle to follow proper fitness routines due to a lack of professional guidance or personalized recommendations. Artificial Intelligence (AI) and Machine Learning (ML) technologies can analyze user data and generate personalized workout recommendations. This project proposes an AI-based personalized fitness coach implemented as a web application.

2. Literature Review

Several studies have explored AI-based health and fitness recommendation systems. Recent research demonstrates that machine learning algorithms can analyze user health data and provide customized workout plans. AI-driven systems are more effective than traditional rule-based applications because they adapt to individual user characteristics.

3. Methodology

The proposed system uses a web-based architecture combining frontend, backend, and machine learning components. The user enters personal health details such as age, height, weight, gender, and fitness goals. These inputs are processed by a trained machine learning model which predicts suitable fitness activities.

Technologies Used:
Frontend: HTML, CSS, Bootstrap
Backend: Python Flask
Machine Learning: Scikit-learn
Dataset: dataset.csv

4. System Architecture

The system architecture consists of multiple modules including the user interface, backend server, machine learning model, and result display module.

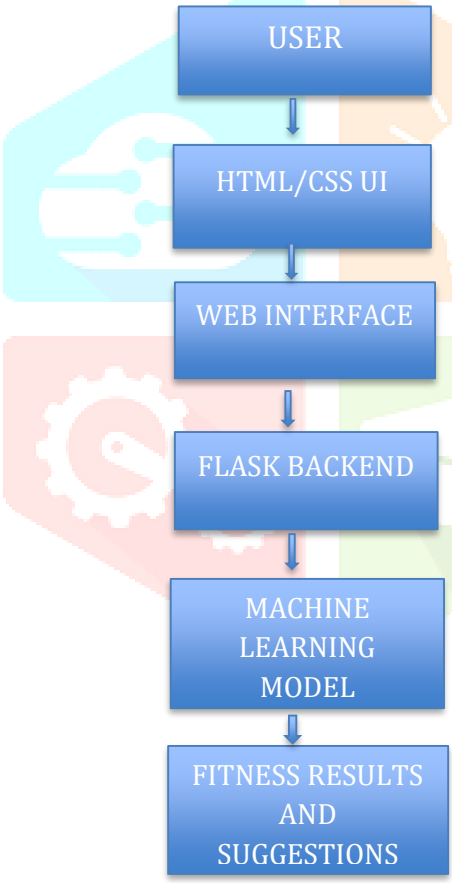


Fig 1: System Architecture of AI Fitness Coach

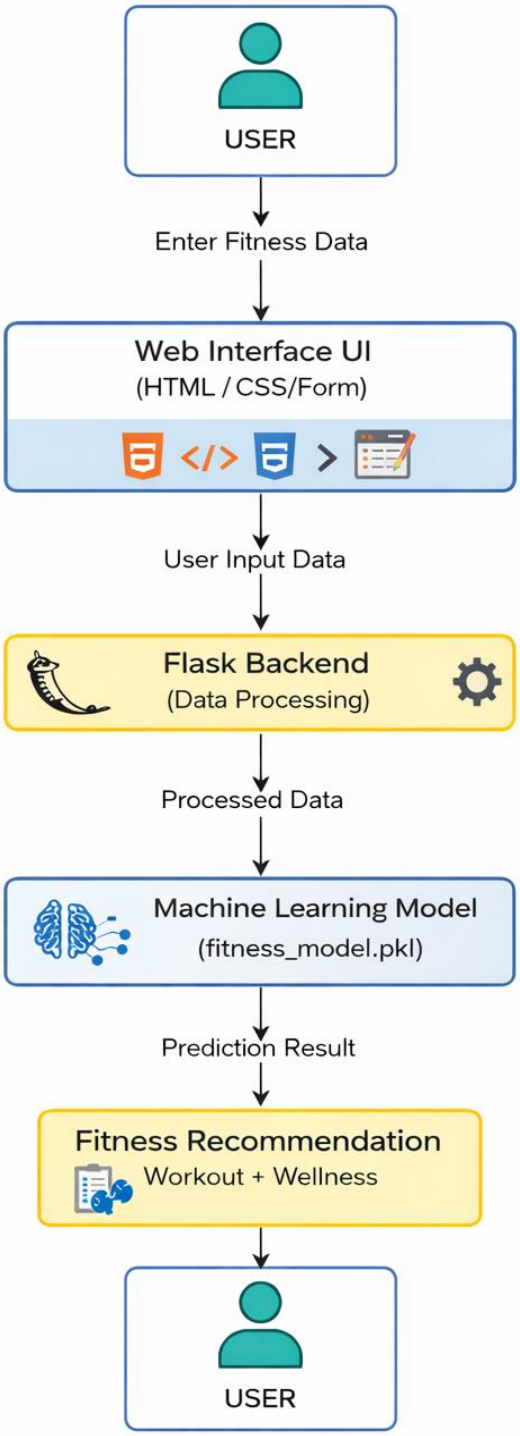


Fig 2: Data Flow Diagram of AI-Based Fitness Recommendation System

Step-by-step flow of user data from input to personalized fitness recommendation using a Flask backend and machine learning model.

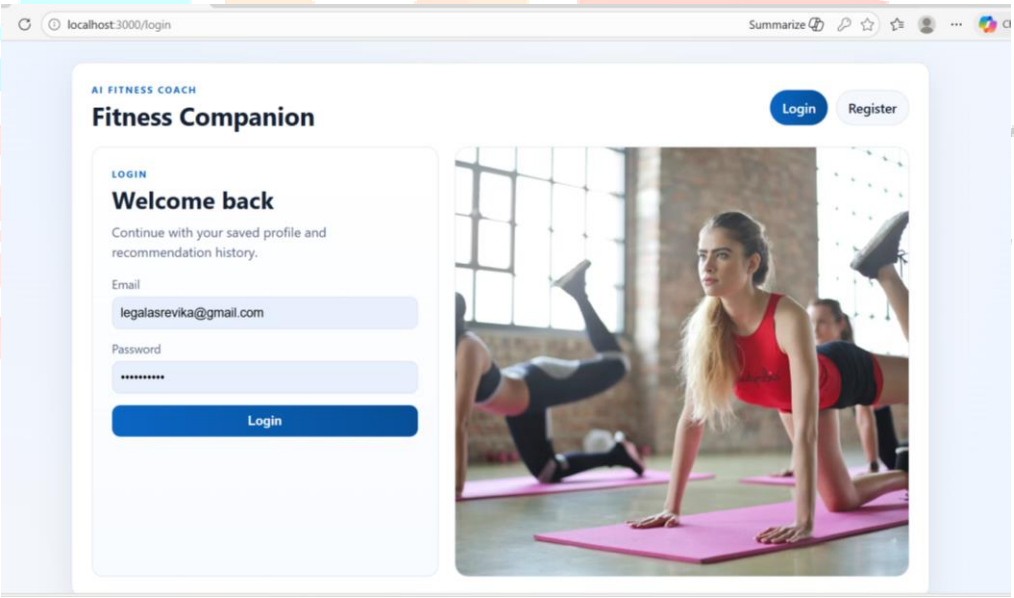
5. Implementation

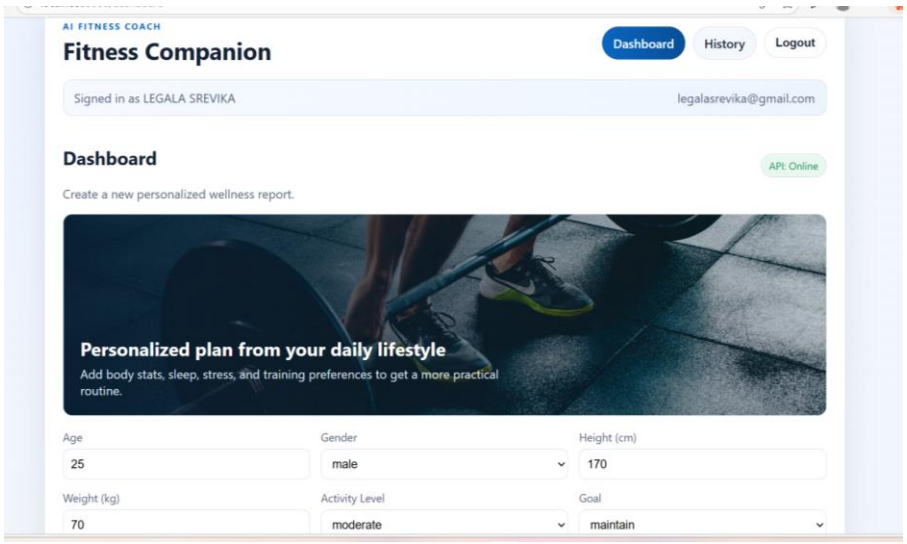
The system is implemented using Python Flask. The trained machine learning model is stored as fitness_model.pkl. The backend loads the model and processes user inputs to generate fitness recommendations.

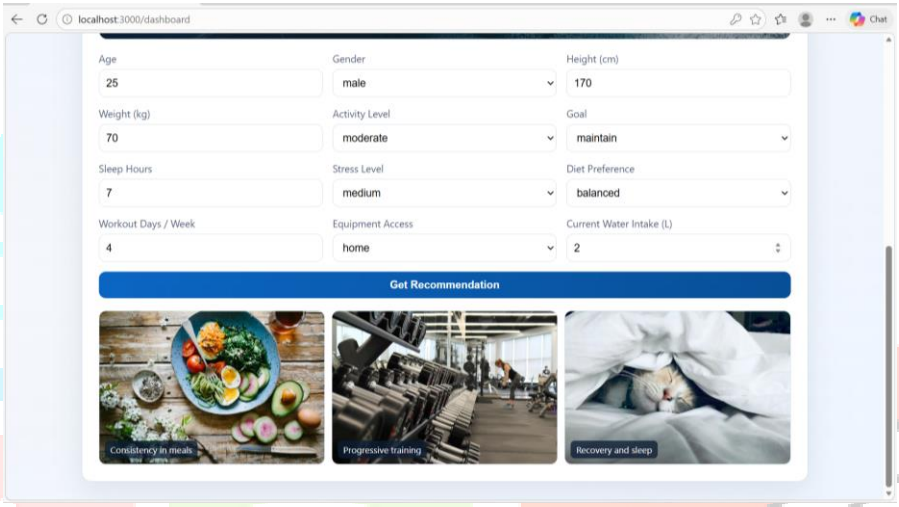
Project Files:
app.py – Backend logic
train_model.py – Model training
fitness_model.pkl – ML model
dataset.csv – Dataset
Frontend folder – UI pages

6. Results

The developed system successfully generates personalized fitness recommendations based on user input data. When the user enters details such as age, height, weight, gender, and fitness goal, the system processes the data using the trained machine learning model. The system then generates appropriate workout suggestions and wellness guidance tailored to the user's profile. The web interface displays the recommended fitness plan in an easy-to-understand format. The results demonstrate that AI-based systems can effectively provide personalized fitness guidance and improve user engagement with healthy lifestyle practices.




AI FITNESS COACH
Fitness Companion
Dashboard
History
Logout
Signed in as LEGALA SREVIKA
legalasrevika@gmail.com
Dashboard
API: Online
Create a new personalized wellness report.
Personalized plan from your daily lifestyle
Add body stats, sleep, stress, and training preferences to get a more practical routine.
Age
25
Gender
male
Height (cm)
170
Weight (kg)
70
Activity Level
moderate
Goal
maintain


localhost:3000/dashboard
Chat
Age
25
Gender
male
Height (cm)
170
Weight (kg)
70
Activity Level
moderate
Goal
maintain
Sleep Hours
7
Stress Level
medium
Diet Preference
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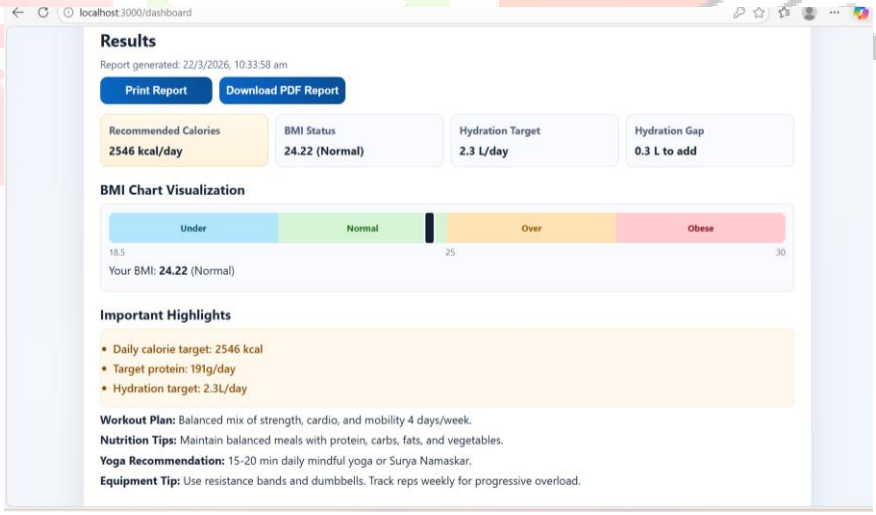
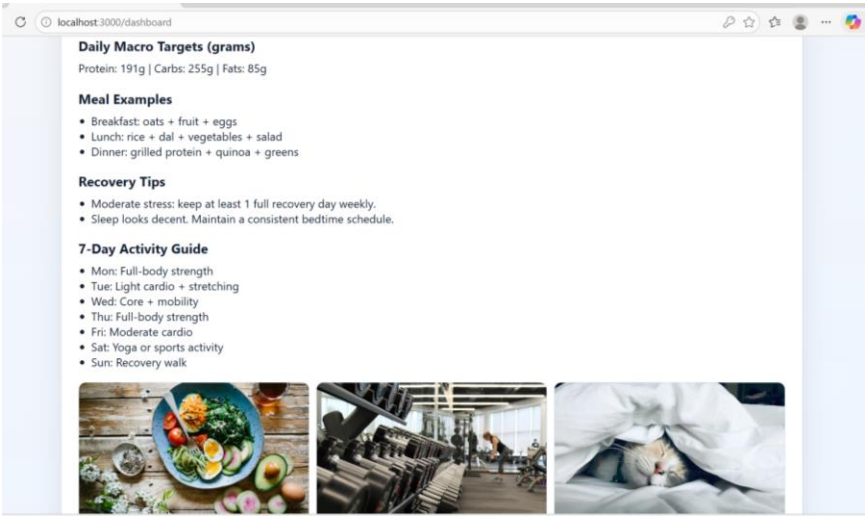
home
Current Water Intake (L)
2
Get Recommendation
Consistency in meals
Progressive training
Recovery and sleep


localhost:3000/dashboard
Results
Report generated: 22/3/2026, 10:33:58 am
Print Report
Download PDF Report
Recommended Calories
2546 kcal/day
BMI Status
24.22 (Normal)
Hydration Target
2.3 L/day
Hydration Gap
0.3 L to add
BMI Chart Visualization
Under
Normal
Over
Obese
18.5
25
30
Your BMI: 24.22 (Normal)
Important Highlights
Daily calorie target: 2546 kcal
Target protein: 191g/day
Hydration target: 2.3L/day
Workout Plan: Balanced mix of strength, cardio, and mobility 4 days/week.
Nutrition Tips: Maintain balanced meals with protein, carbs, fats, and vegetables.
Yoga Recommendation: 15-20 min daily mindful yoga or Surya Namaskar.
Equipment Tip: Use resistance bands and dumbbells. Track reps weekly for progressive overload.



7. Advantages

- Personalized fitness recommendations
- Easy-to-use web interface
- AI-driven health guidance
- Accessible through any browser

8. Conclusion

This paper presents an AI-based Personalized Fitness and Wellness Coach using machine learning techniques. The system provides customized workout recommendations based on user health parameters. Future improvements may include wearable device integration and real-time health monitoring.

Acknowledgment

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