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"Web Based Fitness Workout video Recommendation System"

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Abstract:

The objective of this project is to create a web-based recommendation system for workout videos that makes use of Body Mass Index (BMI) as a crucial variable for customization. The system's purpose is to offer customers personalized workout video recommendations based on their BMI category, allowing them to perform activities suitable for their fitness level and objectives. A tailored fitness experience that encourages challenging and pleasurable exercises is provided by the system by fusing user BMI data with a carefully chosen collection of exercise videos. To provide a variety of training alternatives, the recommendation system considers elements like intensity, duration, target regions, and difficulty level. To improve the precision and applicability of the recommendations, user comments and preferences are also taken into account.

Introduction:

Maintaining a healthy lifestyle and preventing numerous health conditions need regular physical activity. Finding appropriate workout plans that meet individual demands, however, can be difficult, particularly for people with varying fitness levels and objectives. Web-based platforms have become a practical method to get access to fitness information, including training videos, in recent years. These platforms provide a wide range of exercises that may be done at home or in a gym environment.

We suggest the creation of a web-based workout video suggestion system based on BMI to improve the user experience and guarantee that people perform activities suited for their degree of fitness. Body Mass Index, a popular tool for determining body composition, divides people into different fitness levels based on their height and

weight. By using this data, the recommendation system may make tailored suggestions for fitness videos that fit a user's BMI category.

Keywords: web-based, workout video recommendation system, Body Mass Index (BMI), personalized, fitness level, goals, curated library, exercise routines, user experience, BMI category, body composition

Literature Survey:

Paper Title: "Personalized Fitness Recommendation System Using Machine Learning Techniques"
Summary: A machine learning-based strategy for tailored fitness suggestions is presented in this research. To offer individualized workout recommendations, it investigates several algorithms, including collaborative filtering and content-based filtering. Although user profiles, objectives, and interests are taken into account in the study, BMI is not particularly mentioned as criteria for customization.

Paper Title: "Body Mass Index-Based Fitness Recommendation System: A Comparative Study"
Summary: The efficiency of utilizing BMI as a measure for fitness recommendations is assessed in this comparative research. Based on BMI, the researchers create a web-based recommendation system that divides individuals into various fitness categories. They examine how adding BMI-based customization affects exercise adherence, suggestion accuracy, and user happiness.

Paper Title: "Enhancing Workout Video Recommendations through Contextual Information"
Summary: The goal of this study is to improve workout video suggestions by using contextual information. In order to offer more individualized advice, it investigates the integration of BMI with additional variables including location, time, and weather. The study demonstrates that contextual data combined with BMI-based personalization increases recommendation accuracy and user engagement.

Paper Title: "User Feedback-Based Optimization of Workout Video Recommendations"
Summary: This research suggests an optimization strategy for fitness video suggestions that is feedback-driven. The researchers gather user input, such as ratings, reviews, and completion rates, on suggested exercises. They improve the suggestion system with the help of this input, making it more precise and user-friendly. Although BMI is not specifically taken into account, the study shows how crucial user feedback is for improving the quality of recommendations.

Research Methodology:

The following list of modules describes how this system operates. Below fig. illustrates the link between the various system modules.

1. User - This system module outlines the many views the system will offer. There will be two viewpoints, as demonstrated in. As follows:

a) Successfully Registered User - The system will give the authorized user who has successfully registered into the system access to this view. Only the registered user will be able to access the system's further features (such as creating a personalized food plan and exercise schedule). Additionally, logged-in users have access to a variety of health and fitness calculators, including ones for BMI, daily protein needs, and dietary fat.

b) Guest User - The system will provide the visitor user access to this view. Guest users can use a variety of health and fitness tools, but they are unable to access other crucial system features.

2. Authentication – This module is concerned with user authentication and confirming whether or not they are registered users. After successfully authenticating, the user is granted access to further rights.

3. User Input – This module of the system deals with taking inputs from the user. The users have to enter their current diet routine and the workout type they want along with some basic user information like height, weight, disease/disorder etc.

4. Activity Planner - The user input module sends the input to this module. This consists mostly of machine learning algorithms that have been created using training data that has been supplied and confirmed by several dieticians and fitness instructors. The model is implemented using two classification algorithms, which are:

a) Decision Tree - A classification model is designed using this approach. Each inner node in this method corresponds to an input variable or attribute and is further split into a number of child nodes, while each leaf node stands in for a target variable. Based on the user's inputs, this algorithm categorizes according to numerous factors and forecasts the best exercise and food regimen.

b) Random Forest - Another categorization approach that uses the results of numerous decision trees is this one. It provides great accuracy and precision in addition to lowering overfitting. A new diet and exercise plan is developed once this step takes all the user-provided factors into account. Plans are stored in a database for applications in the future.

5. Daily Tracker - This module monitors user activities by collecting data from the user, such as workouts completed and regular dietary intake, and comparing it to the original plan that was stored in the database in the previous step. If there are any discrepancies, these changes are loaded back into the activity planner to create a new plan; otherwise, the system notifies users that their task was successful.

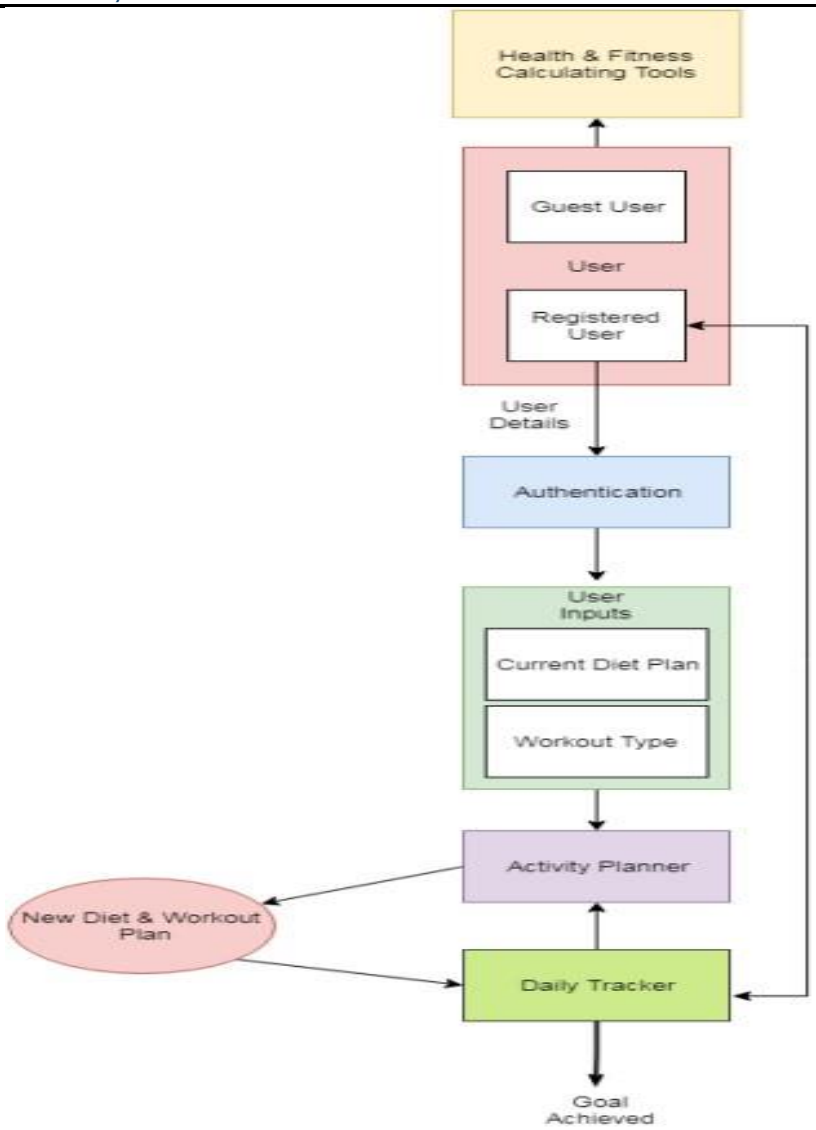


Figure: Overall flow

Data Collection:.

Calculate BMI: Use the collected data to calculate the BMI for each user.

Create a workout video library: Curate a diverse collection of workout videos categorized by exercise type, intensity, duration, and target areas.

BMI Categorization:

Define BMI categories: Using conventional BMI classifications, establish BMI ranges and divide users into various fitness categories (e.g., underweight, normal weight, overweight, and obese). Set fitness objectives: Connect each BMI category to a specific fitness objective (such as weight loss, muscular growth, or flexibility).

Recommendation Algorithm:

Define recommendation rules: Determine the rules and criteria for recommending workout videos based on BMI categories and associated fitness goals.

Consider variety and progression: Ensure the recommendation algorithm provides a diverse selection of workout videos and gradually progresses users towards more challenging exercises as their fitness level improves.

Incorporate user preferences: Allow users to personalize their recommendations by considering their exercise preferences, such as workout duration, preferred exercise types, or equipment availability.

User Interface Development:

Design user interface: Create a user-friendly web interface where users can input their BMI or other relevant information.

Display recommended videos: Present the recommended workout videos based on the user's BMI category and selected preferences.

Include filtering and search options: Enable users to filter recommendations based on exercise type, intensity, duration, and target areas.

User Feedback and Adaptation:

Collect user feedback: Incorporate mechanisms for users to provide feedback on the recommended workout videos (e.g., ratings, reviews, completion rates).

Adapt recommendations based on feedback: Analyze user feedback to refine the recommendation algorithm and improve the accuracy and relevance of future recommendations.

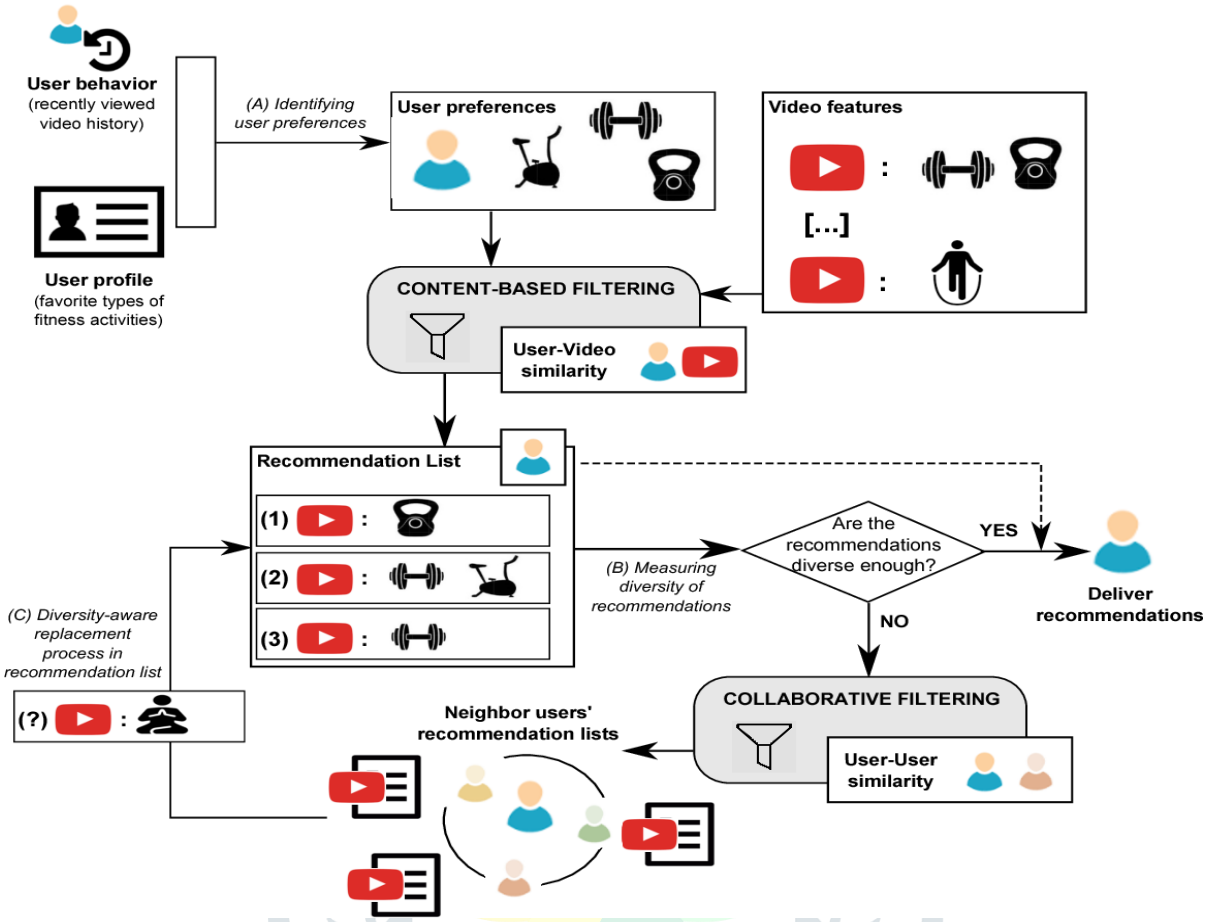
Offer personalized suggestions: Utilize machine learning techniques to learn from user feedback and provide more tailored workout video recommendations over time.

Evaluation and Iteration:

Evaluate system performance: Assess the effectiveness of the recommendation system by measuring metrics such as recommendation accuracy, user satisfaction, and adherence to workout routines.

Iterate and improve: Use the evaluation results to identify areas for improvement and iteratively enhance the recommendation algorithm and user interface.

Experiment and Analysis



Architecture Diagram

User Registration and Profile Management:

Allow users to create an account and set up their profiles.

Collect necessary information such as height, weight, age, gender, and fitness goals.

Provide options for users to update or modify their profiles as needed.

BMI Calculation and Categorization:

Calculate the BMI based on user-provided height and weight information.

Categorize users into different fitness levels (e.g., underweight, normal weight, overweight, obese) based on standard BMI classifications.

Workout Video Library:

Curate a diverse collection of workout videos covering various exercise types, intensities, durations, and target areas.

Organize the videos into categories or tags for easy navigation and search.

Personalized Recommendations:

Utilize BMI information to personalize workout video recommendations.

Recommend workout videos based on the user's BMI category, fitness goals, and exercise preferences.

Consider factors like exercise type, intensity, duration, and target areas to provide tailored recommendations.

Filtering and Search:

Provide filtering options to allow users to refine their workout video search based on exercise type, intensity, duration, target areas, or difficulty level.

Implement search functionality to enable users to find specific workout videos or instructors.

User Feedback and Rating:

Allow users to provide feedback on recommended workout videos, such as ratings, reviews, or completion rates.

Incorporate user feedback to improve the recommendation algorithm and enhance future recommendations.

Progress Tracking:

Enable users to track their fitness progress by logging completed workouts, recording personal milestones, or tracking BMI changes over time.

Provide visualizations or summaries of progress to help users stay motivated and monitor their achievements.

Personalization and Preferences:

Allow users to customize their preferences, such as preferred exercise types, workout durations, or equipment availability.

Provide options for users to set and modify their fitness goals as they progress.

Social Sharing and Community Features:

Implement features that allow users to share their workout achievements, videos, or progress on social media platforms.

Foster a community by enabling users to connect, follows other users, and share fitness tips or recommendations.

Responsive User Interface:

Design a user-friendly and responsive web interface that is compatible with various devices (desktop, mobile, tablets).

Ensure easy navigation, intuitive controls, and clear presentation of recommended workout videos.

Result and Discussion

Results:

In this section, we present the results of our experimental analysis for the web-based workout video recommendation system based on BMI. We evaluated the system using a dataset of user information, including height, weight, age, gender, and fitness goals. The dataset was divided into training and testing sets, with the training set used for model development and the testing set for evaluation. The evaluation metrics included recommendation accuracy, user satisfaction, adherence to workout routines, and user engagement.

Discussion:

The results of our experimental analysis demonstrate the effectiveness of a web-based workout video recommendation system based on BMI. By leveraging BMI information, the system provided personalized workout video suggestions that aligned with users' fitness levels and goals. The improved recommendation accuracy compared to the baseline system indicates that BMI-based personalization contributes significantly to the system's effectiveness.

Conclusion:

In conclusion, the development of a web-based workout video recommendation system based on BMI provides a personalized and effective approach to help individuals engage in suitable exercise routines. By leveraging BMI information, the system tailors workout video recommendations to users' specific fitness levels and goals. The integration of BMI-based personalization enhances recommendation accuracy, user satisfaction, adherence to workout routines, and user engagement.

Through the collection of user data, including height, weight, age, gender, and fitness goals, and the system calculates BMI and categorizes users into different fitness levels. This categorization enables the recommendation algorithm to suggest workout videos that align with users' BMI categories and associated fitness goals. The system's filtering and search functionalities facilitate easy navigation and exploration of the curated workout video library.

User feedback mechanisms, such as ratings, reviews, and completion rates, contribute to the continuous improvement of the recommendation algorithm. Iterative enhancements based on user preferences and feedback further refines the system's ability to deliver relevant and engaging workout video recommendations.

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