Training Program Recommender System

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Abstract—This study introduces a novel Training Program Recommender System (TPRS), designed to optimize fitness routines by using Information Retrieval techniques. The TPRS considers user's choice of muscles and equipment available to workout with consideration of bio parameters. It also considers the user's past activity and improves the results based on continuous feedback. The implementation of this recommender system could significantly impact personalized fitness planning with nutrition plans, fostering a more scientific approach to physical training.

Index Terms—Sequential Model, TensorFlow, Keras, TF-IDF, Cosine Similarity, MultiLabel Binarization, Workout Optimization, Binary Cross Entropy.

I. Introduction and Motivation

In our commitment to holistic fitness, the Training Program Recommender System integrates personalized nutrition guidance with its workout recommendations. This dual-focused approach combines cutting-edge technology with health science, ensuring that users not only receive custom exercise plans but also tailored dietary suggestions that complement their fitness objectives. The system adeptly interprets nutritional data, translating it into actionable insights that propel users towards their goals. The motivation for the Training Program Recommender System stems from a desire to overcome the limitations of one-size-fits-all fitness solutions by providing personalized workout and nutrition plans tailored to individual health goals, fitness levels, and lifestyle preferences. Utilizing advanced machine learning and natural language processing, the system dynamically adapts to real-time user feedback, ensuring recommendations remain relevant and customized. This approach aims to enhance user engagement and satisfaction, improve health outcomes, and push the boundaries of what digital health platforms can achieve through technological innovation and scientific insight. The project's goal is not only to meet current fitness needs but also to evolve and scale over time, adapting to new trends and user feedback for continuous improvement.

Identify applicable funding agency here. If none, delete this.

II. PROBLEM STATEMENT

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Finding the right training program is a common challenge for many. The market is flooded with generic, one-size-fits-all solutions that fail to consider individual differences in fitness levels, goals, and lifestyle constraints. This mismatch can lead to demotivation, plateauing fitness levels, and in some cases, injury. There is a clear demand for a system that can intelligently analyze a user's profile and deliver a tailored training regimen that evolves with their fitness journey. To overcome this challenge, TPRS has emerged as a promising technology that allows for the retrieval of workout plan to a given query. In this context, the problem formulation involves developing an effective TPRS system for food images that can enable users to get their workout plan with nutrition recommendation and thereby enhance the overall food ordering experience.

III. NOVELTY

The Training Program Recommender System sets a new standard in personalized fitness by merging an extensive exercise database with detailed user profiles. It considers key bioparameters like age and body composition, lifestyle aspects such as work schedules and available equipment, and personal preferences, including workout types and intensity. Additionally, it aligns exercise recommendations with dietary needs and specific health objectives like weight loss or muscle building. This comprehensive integration ensures that each training program is not only tailored to fit individual physical attributes and daily life but also resonates with personal tastes and supports overall health and fitness goals.

IV. METHODOLOGY

This section describes the steps taken to develop our userbased retrieval system for TPRS

A. Data Collection

We collected data by scraping images from Google Images, Pinterest, Unsplash and Instagram by using selenium in the Python language, as well as Beautiful Soup and the Unsplash API

B. Units

- Use either SI (MKS) or CGS as primary units. (SI units are encouraged.) English units may be used as secondary units (in parentheses). An exception would be the use of English units as identifiers in trade, such as "3.5-inch disk drive".
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 Spell out units when they appear in text: ". . . a few henries", not ". . . a few H".
- Use a zero before decimal points: "0.25", not ".25". Use "cm³", not "cc".)

C. Equations

Number equations consecutively. To make your equations more compact, you may use the solidus (/), the exp function, or appropriate exponents. Italicize Roman symbols for quantities and variables, but not Greek symbols. Use a long dash rather than a hyphen for a minus sign. Punctuate equations with commas or periods when they are part of a sentence, as in:

$$a + b = \gamma \tag{1}$$

Be sure that the symbols in your equation have been defined before or immediately following the equation. Use "(1)", not "Eq. (1)" or "equation (1)", except at the beginning of a sentence: "Equation (1) is . . ."

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- A graph within a graph is an "inset", not an "insert". The
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- Do not use the word "essentially" to mean "approximately" or "effectively".
- In your paper title, if the words "that uses" can accurately replace the word "using", capitalize the "u"; if not, keep using lower-cased.
- Be aware of the different meanings of the homophones "affect" and "effect", "complement" and "compliment", "discreet" and "discrete", "principal" and "principle".
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Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

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TABLE I TABLE TYPE STYLES

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Head	Table column subhead	Subhead	Subhead
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^a Sample of a Table footnote.			

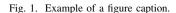


Figure Labels: Use 8 point Times New Roman for Figure labels. Use words rather than symbols or abbreviations when writing Figure axis labels to avoid confusing the reader. As an example, write the quantity "Magnetization", or "Magnetization, M", not just "M". If including units in the label, present them within parentheses. Do not label axes only with units. In the example, write "Magnetization $\{A[m(1)]\}$ ", not just "A/m". Do not label axes with a ratio of quantities and units. For example, write "Temperature (K)", not "Temperature/K".

V. LITERATURE REVIEW

The intersection of technology and health has catalyzed the development of various digital interventions aimed at promoting physical fitness. However, an examination of existing literature reveals a recurring shortfall in these technologies: a superficial level of personalization that fails to consider the intricacies of individual health objectives and lifestyle factors (Loellgen et al., 2020; Sushmitha et al., 2022). While platforms such as Nike Training Club, Fitbod, and TrainHeroic offer personalized exercise regimens to an extent, they often do not account for the evolving preferences and feedback of their users, leading to a static and less engaging user experience. Current methodologies in training program recommendation primarily employ content-based and collaborative filtering techniques. While effective in mapping user preferences to content, these methods exhibit limitations in adapting to realtime user feedback, particularly when such feedback is articulated in unstructured formats like natural language (Donciu et al., 2012; Chen et al., 2021). This observation underscores the potential for in- corporating NLP to interpret user feedback dynamically, enabling a recommendation system that evolves in response to user interaction and feedback. The proposed Training Program Recommender System aspires to transcend these limitations by integrating a comprehensive dataset that includes a wide range of exercises, userspecific biometric data, and lifestyle considerations. This integration, coupled with the implementation of NLP for feedback interpretation, positions the system to offer a nuanced, adaptive solution to fitness recommendation. Initial user engagement metrics from a prototype deployment underscore the potential of this approach, indicating a promising avenue for further development and refinement (Dijkhuis et al., 2018). In conclusion, the literature points to a significant need for a more personalized, adaptive approach to fitness technologyone that not only acknowledges but actively incorporates the diverse needs and feedback of its users. The Training Program Recommender System aims to bridge this gap, offering a novel contribution to the field of personalized fitness technology.

ACKNOWLEDGMENT

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