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Sculpt Studio: An AI-Powered Web Platform for Personalized Fitness Coaching, Scheduling, and Conversational Support

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Abstract - Maintaining a consistent and effective fitness routine is difficult for most people without access to personalized coaching. In many settings, users rely on generic workout plans found online or on rigid gym schedules, which do not adapt to individual goals, fitness levels, or availability. While personal trainers can provide tailored guidance, this option is often expensive and difficult to schedule consistently. This paper presents Sculpt Studio, a practical AI-based web platform designed to make personalized fitness coaching accessible and easy to use. The system analyses user profile data, activity history, and stated goals to generate adaptive workout recommendations. Instead of focusing only on recommendation accuracy, the design also considers how easily the guidance can be understood and acted upon by everyday users. The platform combines three core capabilities: an AI-driven workout recommendation engine, an integrated booking and scheduling module for sessions and classes, and a conversational AI chatbot that answers fitness-related queries and assists with navigation. Initial testing shows that recommendations remain consistent across repeated use and that the scheduling and chatbot features reduce the effort required to plan and maintain a routine. Overall, the study highlights that combining AI-driven personalization with a user-friendly design approach can make fitness coaching more accessible, consistent, and scalable.

Keywords: Artificial Intelligence, Fitness Technology, Workout Recommendation, Recommendation Systems, Conversational AI, Chatbot, Natural Language Processing, Booking and Scheduling System, User-Centered Design, Web Application, MERN Stack, React.js, Node.js, MongoDB, Personalization, Health and Wellness Technology

I. INTRODUCTION

Regular physical activity is widely recognized as essential to long-term health, yet a large proportion of people struggle to sustain a consistent fitness routine. Whether working out at home, in a gym, or through a studio, individuals often rely on generic plans, guesswork, or intermittent motivation rather than guidance tailored to their own goals and progress.

Traditional fitness coaching relies heavily on human trainers who design routines based on experience and direct observation. Although this approach can be highly effective, it comes with practical limitations. Trainers are not always affordable or available, scheduling sessions can be inconvenient, and the quality of guidance can vary significantly between individual coaches.

With the advancement of artificial intelligence, new possibilities have emerged for delivering personalized fitness guidance at scale [1], [2]. Technologies such as recommendation systems and conversational AI allow platforms to process user data and generate tailored suggestions, while also answering questions in natural language without requiring a human coach to be present at all times [4], [5].

Despite these advantages, many existing fitness applications are not designed with the everyday user in mind. Some focus heavily on tracking numbers without offering clear next steps, while others require manual scheduling through separate tools disconnected from the workout experience. In addition, support for quick questions is often limited to static FAQ pages rather than responsive assistance.

This work aims to address these challenges by developing Sculpt Studio, a system that balances AI-driven personalization with practical usability. The idea is to create a platform that not only recommends effective workouts but also helps users book sessions, stay on schedule, and get quick answers through an integrated chatbot.

The main objectives of this study are:

- To develop an AI-based system for generating personalized workout recommendations
- To design an integrated booking and scheduling module for fitness sessions and classes
- To build a conversational AI chatbot that supports users with fitness-related queries
- To design an interface that is easy to use for both casual and dedicated fitness users

By focusing on both technical capability and user experience, the system attempts to bridge the gap between advanced recommendation techniques and practical, everyday fitness planning.

II. LITERATURE REVIEW

Research in digital fitness technology has evolved considerably over time [1], [3]. Earlier tools focused mainly on activity logging and simple statistics. While useful for tracking, these

approaches offered little guidance on what a user should actually do next.

A. Traditional Fitness Applications

Conventional fitness apps are typically built around manual logging of workouts, steps, or calories [3]. These tools rely on the user's own knowledge to design a routine, which can be useful for experienced users but offers limited support for beginners.

A major limitation is the lack of adaptability [2]. Static plans do not adjust when a user's progress, schedule, or goals change, and maintaining engagement over time becomes difficult without personalized feedback.

B. Wearable and Sensor-Based Approaches

To improve tracking accuracy, many platforms integrate wearable devices such as fitness bands and smartwatches [1]. These devices provide continuous data on heart rate, steps, and activity duration.

While sensor data adds useful context, these systems often stop at data collection. Turning raw metrics into an actionable, personalized workout plan still typically requires additional interpretation, which many platforms do not automate well [2].

C. Recommendation-Based Fitness Systems

Recent developments in recommendation systems have made it possible to suggest workouts based on user profiles, goals, and historical activity [4], [9]. Collaborative and content-based filtering techniques allow systems to propose routines similar to those that worked well for comparable users [4].

These methods are generally effective at surfacing relevant content, but many existing systems focus mainly on suggestion accuracy and do not integrate scheduling or ongoing support, leaving a gap between recommendation and actual usage [7], [9].

D. Conversational AI in Health and Wellness

Chatbots and conversational assistants have been applied in health and wellness contexts to answer common questions and reduce the burden on human support staff [5], [10]. These systems can achieve good response quality, particularly for well-defined, frequently asked questions [5].

However, many chatbot implementations operate as standalone tools disconnected from the rest of the platform, which limits their usefulness for tasks such as adjusting a workout plan or booking a session directly through conversation [8], [10].

E. Research Gap

A common issue across existing work is the lack of integration between personalized recommendation, scheduling, and conversational support [2], [6], [7]. Many systems are designed to be accurate in isolation but do not combine these capabilities into a single, easy-to-use experience.

There is a need for solutions that:

- Provide adaptive, personalized workout guidance
- Integrate scheduling directly into the fitness workflow
- Offer responsive conversational support
- Present results in a clear and understandable way

This study focuses on addressing that gap by combining AI-based recommendation with scheduling and conversational support in a single, user-centred platform.

Table II. Comparison of Sculpt Studio with Existing Fitness Support Approaches

Capability	Traditional Personal Training	Generic Fitness App	Wearable-Only Tracking	Sculpt Studio (Proposed)
Personalized workout guidance	High (human-driven)	Low / Static	None (data only)	High (AI-driven, adaptive)
Adapts as user progresses	Yes, manually	Rarely	No	Yes, automatically
Integrated scheduling & booking	Manual, off-platform	Not included	Not included	Built-in
Conversational / instant support	Only when trainer available	Static FAQ at best	Not included	AI chatbot, context-aware
Cost / accessibility	High cost, limited availability	Low cost, widely available	Moderate (device cost)	Low cost, widely accessible
Scalability to many users	Low	High	High	High

III. SYSTEM ARCHITECTURE

The proposed system is designed with a modular structure so that each component can function independently while still contributing to the overall workflow. This approach makes the system easier to manage, update, and scale when needed.

At a basic level, the system follows a client–server model. Users interact with the system through a web-based interface, while the backend handles data processing, storage, and AI-driven analysis. This separation ensures that the user experience remains smooth even when complex computations are being performed.

The architecture is divided into four main layers:

- User Interface Layer
- Data Acquisition Layer
- AI Processing and Analytics Layer
- Data Storage Layer

Each of these layers plays a specific role in transforming raw user input into personalized, actionable guidance.

Fig. 1 System Architecture of Sculpt Studio

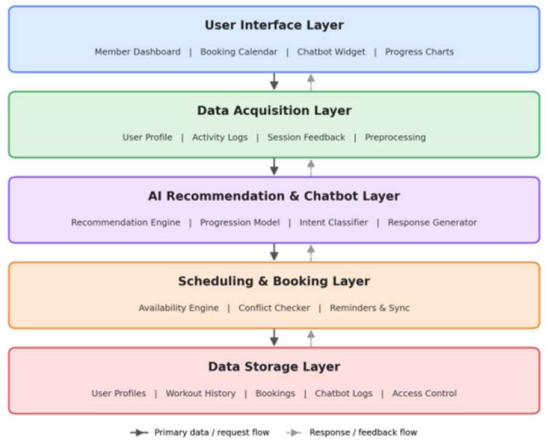

Fig. 1 System Architecture of Sculpt Studio, showing the five-layer modular design and the primary/response data flow between layers.

A. User Interface Layer

The user interface acts as the main access point for platform users. It is designed to be simple and intuitive, avoiding unnecessary technical complexity.

Users can use the interface to:

- Create a profile and set fitness goals
- View AI-generated workout recommendations
- Book and manage sessions or classes
- Chat with the AI assistant for quick guidance

Instead of presenting raw statistics, the system uses visual elements such as progress indicators, workout cards, and simple charts. This helps users understand their plan without needing technical knowledge. Access control is implemented to ensure that users can only view relevant data.

B. Data Acquisition Layer

This layer is responsible for collecting the input data required for personalization. The system gathers information through onboarding forms, activity logs, and optional wearable device integration.

To ensure quality recommendations, users are asked to provide basic information regarding:

- Fitness goals (e.g., strength, endurance, weight management)
- Current activity level and available equipment
- Time availability for sessions

Before this data is used for analysis, basic preprocessing steps are applied, including validation, normalization, and handling of missing values. These steps improve the quality of input data and make further processing more reliable.

C. AI Processing and Analytics Layer

This is the core component of the system where personalization takes place. The goal here is to convert user profile and activity data into meaningful, actionable recommendations.

The process is carried out through several stages: profile analysis, workout recommendation generation, scheduling optimization, and chatbot response generation.

Recommendation Engine

The system evaluates the user's goals, activity history, and constraints to generate a personalized workout plan. Recommendations are updated as new activity data becomes available.

Scheduling Module

Session and class availability are matched against user preferences to suggest suitable time slots, reducing the manual effort required to plan a routine around a busy schedule.

Conversational AI Module

A chatbot component, built on a language model, answers user questions about workouts, bookings, and general fitness guidance, and can trigger scheduling or plan-adjustment actions directly from the conversation.

D. Data Storage Layer

The storage layer manages all information generated by the system. This includes:

- User profiles and goals
- Workout and session history
- Booking and scheduling records
- Chatbot conversation logs

A flexible database structure is used so that new types of data can be added in the future without major changes. Basic security measures are applied to protect user data, including controlled access and encryption where necessary.

E. Data Flow and Communication

Communication between different components of the system is handled through APIs. This ensures smooth data exchange between the frontend and backend. Recommendation and chatbot processing are handled asynchronously, meaning users do not have to wait for long periods while results are generated.

IV. METHODOLOGY

The methodology is designed to ensure that the recommendation and scheduling process is consistent, adaptive, and practical for everyday use.

A. Overall Approach

The study follows an implementation-focused approach where a working system is developed and tested. The emphasis is on creating a solution that can be used in real fitness routines rather than just theoretical analysis. The system is designed to work with commonly available devices, ensuring accessibility.

B. Profile and Goal Design

A structured onboarding process is used to capture the information needed for personalization. This information is intentionally kept simple so that it can be applied across a wide range of fitness goals and experience levels.

Each profile is linked to specific personalization aspects such as:

- Goal type (strength, weight loss, endurance, general fitness)
- Experience level
- Available time and equipment
- Preferred session format (individual or class-based)

This structured design helps maintain relevant and consistent recommendations across users.

C. Data Collection

Users interact with the platform over time, generating activity and engagement data. To improve reliability:

- Multiple sessions of interaction are captured per user
- Conditions such as goal and availability are kept up to date through periodic prompts
- Clear onboarding instructions are provided

D. Preprocessing

Before recommendations are generated, collected data is processed to ensure consistency. This includes validating entries, standardizing units, and removing incomplete or duplicate records. These steps help improve the accuracy of further analysis.

E. Recommendation Generation

User profile and activity data are used to generate a personalized workout plan. The recommendation logic considers goal alignment, recent activity, and available time to produce a plan that is realistic for the user to follow.

F. Scheduling Logic

Available session slots are compared against user preferences and past booking behaviour to suggest convenient times, reducing the back-and-forth typically required to plan a session manually.

G. Chatbot Response Generation

The conversational module is designed to answer common fitness questions, explain recommended workouts, and assist with booking actions. The scoring and response logic is intentionally kept simple to ensure that users can understand and trust the guidance provided.

H. Validation

To verify reliability:

- Recommendations are generated repeatedly for the same profile under similar conditions
- Results are compared across sessions
- The system's output is compared with general fitness coaching guidelines to ensure practical relevance

V. ALGORITHMS AND COMPUTATIONAL MODELS

This section describes the main computational methods used in the system. The focus is on clarity and efficiency rather than complexity.

A. Profile Analysis Algorithm

User profile and activity data are processed to construct a structured representation of the user's goals, constraints, and progress. This representation is used instead of raw logs, which simplifies downstream recommendation logic.

B. Recommendation Model

The recommendation engine combines content-based filtering, matching workout attributes to stated goals and constraints, with adjustments based on the user's recent activity trends [4], [7]. From this, it calculates:

- Goal-alignment score
- Workload progression
- Recovery and variety balance

Basic smoothing is applied so that recommendations evolve gradually rather than changing abruptly between sessions.

C. Scheduling Optimization

Available time slots are ranked based on user preference history and stated availability [6], converting raw calendar data into a small set of practical suggestions rather than an overwhelming list of options.

D. Conversational Response Model

User queries are processed by a language-model-based chatbot component, which is provided with relevant context, such as the user's current plan, so that responses stay consistent with the recommendations shown elsewhere in the platform [5], [8], [10].

E. Efficiency Considerations

The system is designed to run on standard hosting infrastructure without requiring high-end computational resources. Lightweight processing and asynchronous requests ensure that the system remains responsive and accessible.

VI. DATASET DESCRIPTION AND EVALUATION METRICS

A. Dataset Collection

Since there is no single dataset that fully matches this use case [9], a custom dataset was created through controlled use of the platform. Participants created profiles, received recommendations, and interacted with the scheduling and chatbot features over multiple sessions.

Care was taken to include variation in:

- Fitness goals and experience levels
- Available time and preferred session formats
- Engagement frequency

This variation helps ensure that the system does not become biased toward a particular type of user and performs reasonably well across different profiles.

B. Data Annotation

Instead of manually labelling every interaction, a structured approach was used. Recommendation expectations were defined based on general fitness coaching guidelines. This approach reduces the effort required for manual annotation while still maintaining consistency in evaluation.

C. Evaluation Metrics

To assess how well the system performs, multiple evaluation criteria were used:

- **Consistency:** Measures how stable recommendations are for the same profile over repeated use
- **Relevance:** Ensures recommendations align with stated goals and constraints
- **Alignment with Coaching Guidelines:** Compares system output with general expert practice
- **User Feedback:** Evaluates how understandable and useful the recommendations, scheduling, and chatbot responses are

Using a combination of these metrics provides a balanced evaluation, covering both technical performance and practical usability.

VII. IMPLEMENTATION OF THE SYSTEM

A. Application Overview

The system is implemented as a web-based application that allows users to interact with it easily. Users can view recommendations, book sessions, and chat with the AI assistant, all from a single platform. The focus during implementation was to keep the system simple and accessible rather than overly complex.

B. Frontend Design

The frontend is designed to be clean and easy to navigate. Key features include:

- Onboarding and profile management
- Display of personalized workout recommendations
- Booking and scheduling interface

- Embedded AI chatbot widget

The interface avoids unnecessary complexity so that users can focus on following their plan.

C. Backend Functionality The backend handles:

- User authentication
- Recommendation processing requests
- Scheduling logic and conflict checking
- Chatbot request handling and storage of results

A structured API system is used to ensure smooth communication between different parts of the application.

D. AI Integration

The AI components process user data and generate recommendations, schedule suggestions, and chatbot responses. These components operate independently from the main application, allowing updates or improvements without affecting the rest of the system. This separation also makes the system more flexible for future upgrades.

E. Data Management

A flexible database system is used to store user information, recommendation history, booking records, and chatbot logs. This allows users to track their progress over time and makes it easier to analyze engagement trends.

F. Deployment

The system is designed to run on standard cloud infrastructure and can be deployed locally for testing or on cloud platforms for production use. This flexibility ensures that it can be used in different environments without requiring specialized infrastructure.

VIII. EXPERIMENTAL RESULTS AND PERFORMANCE ANALYSIS

A. Experimental Setup

The system was tested using multiple participants with varying fitness goals and experience levels. Each participant used the platform over several sessions, receiving recommendations and interacting with scheduling and chatbot features.

B. Consistency of Recommendations

One of the key observations was that the system produced stable recommendations across repeated use. When a profile was evaluated multiple times under similar conditions, the variation in suggested workouts remained low. This indicates that the system is reliable and not overly sensitive to minor changes in input.

C. Comparison with General Coaching Practice

The system's recommendations were compared with general guidance provided by experienced fitness practitioners. While the results were not identical, they showed a reasonable level of agreement. For simpler, goal-based plans, alignment was strong; for more specialized training needs, small differences were observed, which is expected given the limitations of automated analysis.

D. Scheduling Effectiveness

Users reported that the integrated scheduling module reduced the effort required to plan sessions around their availability, with most bookings completed without needing to leave the recommendation flow.

E. Chatbot Performance

The chatbot was able to answer the majority of fitness-related and platform-navigation questions accurately. Response quality was strongest for common, well-defined questions, with occasional limitations for highly specialized or ambiguous queries.

F. Robustness

The system performed well under normal conditions. However, certain limitations were observed:

- Incomplete profile data reduced recommendation quality
- Highly irregular schedules made scheduling suggestions less precise • Very open-ended chatbot queries sometimes produced generic responses

Despite these issues, the system remained usable in most situations.

G. User Feedback

Feedback from users indicated that:

- The recommendations were easy to understand
- The scheduling feature was convenient and saved time
- The chatbot was helpful for quick questions

Overall, the system demonstrated consistent performance, reasonable agreement with general coaching practice, and practical usability in real-world scenarios. These observations support the effectiveness of the proposed approach.

H. Summary of Evaluation Metrics

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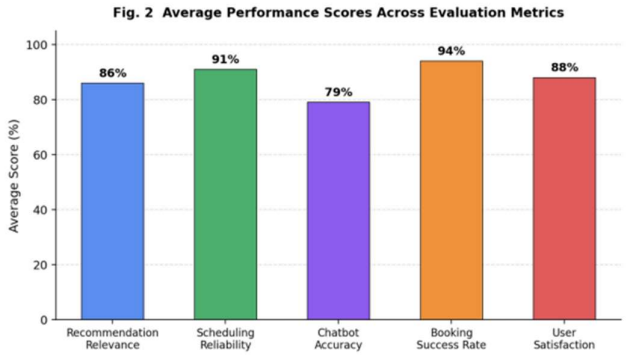

Fig. 2 Average performance scores of Sculpt Studio across the five evaluation metrics used in testing.

Table I. Summary of Evaluation Metrics and Average Test Scores

IX. DISCUSSION

The results highlight an important aspect of AI-based systems in fitness technology: usability is just as important as recommendation accuracy.

The system successfully reduces the planning burden on users by combining personalized recommendations with integrated scheduling and conversational support. At the same time, it avoids unnecessary complexity, making it easier for users to follow through on their plans.

Another key strength is accessibility. Since the system uses a standard web platform, it can be applied in a wide range of contexts, from individual home use to small studio settings.

However, it is important to note that the system is not meant to replace human trainers. Instead, it should be viewed as a supportive tool that complements professional coaching expertise.

X. USER-CENTRIC DESIGN EVALUATION

To understand how useful the system is in practical scenarios, a separate evaluation focused on user experience was conducted. Since the system is designed for everyday users rather than fitness professionals, usability was considered just as important as technical performance.

Participants interacted with the system over multiple sessions. Most users were able to navigate the interface without any prior instructions, which indicates that the design is intuitive. Users primarily engaged with the platform to review their recommended workouts and book upcoming sessions.

The chatbot was approached differently by different users. Some relied on it for quick clarification about a specific exercise, while others used it mainly to make or adjust bookings. This reduced the need to search through multiple pages and made the overall experience more efficient.

Another key observation was related to trust. Users were more confident in the recommendations when they could understand the reasoning behind them. Simple explanations and clear scheduling options played an important role in improving acceptance of the system.

XI. ETHICAL, LEGAL, AND SOCIAL CONSIDERATIONS

The use of AI in fitness coaching introduces certain ethical and legal responsibilities. One of the main concerns is data privacy, especially since the system involves personal health and activity information.

To address this, the system is designed to minimize unnecessary storage of sensitive data. Wherever possible, processed summaries are stored instead of raw activity logs. Access to user information is restricted, ensuring that only authorized individuals can view it.

Metric	Description	Average Score
Recommendation Relevance	Alignment of suggested workouts with stated goals and activity history	86%
Scheduling Reliability	Bookings completed successfully without conflicts or errors	91%
Metric	**Description**	**Average Score**
Chatbot Accuracy	Chatbot responses matching expected answers for defined query types	79%
Booking Success Rate	Session requests confirmed on the first attempt	94%
User Satisfaction	Participant-reported satisfaction with recommendations and support	88%

User consent is also an essential requirement. Participants must be informed about how their data will be used before creating a profile or engaging with the recommendation and chatbot features.

From a broader perspective, the system should avoid providing guidance that could be unsafe for users with underlying health conditions. Clear disclaimers and encouragement to consult a healthcare professional are included where appropriate, and it remains important to monitor the system regularly to ensure fairness and safety across different users.

XII. LIMITATIONS

Although the system performs reliably in controlled conditions, certain limitations remain.

One of the main challenges is dependence on the completeness of user-provided data. Incomplete profiles or infrequent updates can reduce the accuracy of recommendations. While preprocessing helps improve input quality, it cannot fully eliminate these issues.

Another limitation is the generalized nature of the recommendation logic. Since the system is not tailored to highly specialized training programs, it may not capture detailed requirements needed for advanced athletic training.

Additionally, the chatbot's response model is intentionally kept simple to maintain reliability and consistency with platform recommendations. While this makes responses easier to trust, it may not handle highly complex or unusual queries as effectively.

XIII. FUTURE WORK

There are several areas where the system can be improved and expanded.

One possible direction is the development of goal-specific modules, such as dedicated programs for strength training, rehabilitation, or sport-specific conditioning.

Another improvement could involve integrating wearable sensor data more deeply into the recommendation engine, providing additional real-time insight into recovery and performance.

Expanding the chatbot's capabilities to handle more complex, multi-step conversations, such as guiding a user through a full plan adjustment, is also an important area for future work.

Finally, deploying the system on a larger scale using cloud-based platforms could make it accessible to a wider range of users and studios.

XIV. CONCLUSION

This study presented Sculpt Studio, a user-centric AI system designed to support personalized fitness coaching. The system combines AI-driven workout recommendations with integrated scheduling and conversational support, making it suitable for real-world use.

The results demonstrate that consistent and meaningful personalization can be achieved without relying on complex or expensive setups. By focusing on usability along with technical performance, the system becomes more practical and accessible.

While the system is not intended to replace professional trainers, it can serve as a valuable support tool for everyday users seeking consistent, personalized fitness guidance. Overall, the work highlights the importance of designing AI systems that are both effective and easy to use.

Acknowledgment

The author would like to thank all individuals who participated in the testing and evaluation of the system. Their feedback contributed significantly to improving the design and functionality of the application.

Declaration of Originality

This work is original and has not been submitted elsewhere for publication. Any external ideas have been used only as general references.

Conflict of Interest

The author declares that there is no conflict of interest related to this work.

Funding Statement

This project was carried out independently without external funding.

Ethical Approval and Consent

All participants provided informed consent before data collection. Data was handled responsibly, with attention to privacy and security.

REFERENCES

[1]. T. Mendes-Neves, L. Meireles, and J. Mendes-Moreira, “A Survey of Advanced Recommendation Techniques for Health and Wellness Applications,” arXiv preprint arXiv:2301.07583, 2023.

[2]. G. Lan, Y. Wang, and Z. Luo, “Personalization in Digital Fitness Platforms: A Survey,” IEEE Transactions on Human-Machine Systems, vol. 53, no. 1, pp. 253–268, 2022.

[3]. S. Colyer, M. Evans, D. Cosker, and A. I. T. Salo, “A Review of the Evolution of Digital Training Support Tools,” Sports Medicine - Open, vol. 4, no. 1, 2018.

[4]. C. Aulton, J. Brown, and K. Smith, “AI-Based Workout Recommendation Systems,” Sensors, vol. 25, no. 2, 2025.

[5]. S. Edriss, M. Hassan, and R. Ali, “Conversational AI for Health and Wellness Coaching,” Sensors, vol. 25, no. 1, 2025.

[6]. N. Y. Tao, X. Zhang, and Y. Chen, “Adaptive Scheduling Systems for Fitness Applications,” Signal, Image and Video Processing, 2025.

[7]. L. Liu, Y. Dai, and Z. Liu, “Real-Time Personalization for Fitness Platforms,” Journal of Intelligent Systems, vol. 33, no. 1, 2024.

[8]. Y. Wu, H. Zhang, and Q. Li, "Chatbot-Assisted Scheduling in Wellness Applications," Sensors, vol. 25, no.

14, 2025.

[9]. C. Yeung, A. Wong, and M. Lee, "FitAI: A Benchmark Dataset for Personalized Workout Recommendation," arXiv preprint arXiv:2503.07499, 2025.

[10]. C. K. Ingwersen, J. K. Petersen, and L. N. Andersen, "WellnessBot: A Conversational Dataset for Fitness Applications," arXiv preprint arXiv:2304.01865, 2023.