PARSHVANATH CHARITABLE TRUST'S
A.P. SHAH INSTITUTE OF TECHNOLOGY
Department of Computer Science and Engineering
Data Science

Group No.: Group 15
Title of Project : Data Driven AI Fitness Trainer
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Sr. No.	Name of Author	Year of publication	Title of the paper	Methodology used	Technology stack / Algorithm used	Advantages(with proper description)	Disadvantages	Feature	Scope
1	Venkata Sai P Bhamidipati Ishi Saxena Mrs. D. Saisanthiya Dr. Mervin Retnadhas	2023	Robust Intelligent Posture Estimation for an AI Gym Trainer using Mediapipe and OpenCV	The paper presents an AI-based approach for posture estimation in gym workouts. It utilizes a combination of real-time video processing, keypoint detection, and pose estimation techniques. The system was tested on various exercises to evaluate accuracy.	Mediapipe OpenCV Keypoint Detection RNN CNN Back Propagation	**Accurate real-time posture analysis:** The system provides precise posture detection and feedback, improving the user's form and reducing injury risk. **Scalable and flexible:** Can be adapted to various exercises and environments.	**Limited to predefined exercises:** The system may not perform well with exercises or movements outside the trained dataset. **Dependence on good lighting and camera quality:** Performance may degrade in poor lighting or with low-resolution cameras.	Real-time feedback for users Scalable to various exercises Integration with fitness tracking systems	Potential to expand into full-body workout analysis, integration with fitness apps, or personal coaching systems. Could be used in smart gyms or home workout applications.
2	Xiaokang Zhou Yue Li Wei Liang	2020	CNN-RNN Based Intelligent Recommendation for Online Medical Pre-Diagnosis Support	The paper presents a machine learning based approach for recommendation of exercises from the input provided by the user. It utilises a combination of CNN-RNN framework and TFIDF-based clustering to refine the extracted features.	CNN RNN LSTM-RNN	**Personalized Recommendations**: CNNs extract detailed features, and RNNs leverage past user data to provide context-aware, evolving exercise recommendations. **Multimodal Data Handling**: The combination of CNNs, RNNs, and TF-IDF clustering efficiently processes various input types	**High Computational Cost**: The combination of CNNs and RNNs requires significant computational resources, especially for training and processing large datasets. **Model Complexity**: The integrated CNN-RNN framework, along with TF-IDF clustering, can be challenging to fine-tune and interpret.	Personalized Exercise Plans Diverse Exercise Library Goal-Oriented Recommendation	Designing exercise programs that aid in rehabilitation, focusing on safe and gradual recovery based on medical advice. Offering personalized exercise plans in community centers, gyms, and public spaces.
3	Sunny Sharma Vijay Rana Manisha Malhotra	2021	Automatic Recommendation System based on Hybrid Filtering Algorithm	The paper presents a machine learning-based approach for the automatic recommendation System based on user inputs. It combines collaborative and content-based filtering, refining recommendations through profile matching and the Resnick prediction equation.	Collaborative Filtering Content Based Filtering Hybrid Filtering	**Enhanced User Satisfaction:** The hybrid filtering algorithm results in more accurate and relevant recommendations, leading to increased user satisfaction. **Robustness to Sparsity:** Hybrid Filtering method effectively handles sparse data, ensuring reliable recommendations even with limited user interactions.	**Algorithmic Complexity:** Combining multiple filtering techniques creates a complex system that's challenging to develop and maintain. **Latency in Real-Time Applications:** The hybrid algorithm, due to its complex combination of multiple filtering techniques, results in slower processing, and delays in generating recommendations	Real-Time Data Processing Adaptive to User Preference Multi-Domain Applicability	Sync with fitness trackers for a complete health overview, Understand complex dishes and mixed ingredients accurately, Offer meal suggestions based on scanned food and user preferences.
4	Yustus Eko Oktian Elizabeth Nathania Witanto Sandra Kumi Sang-Gon Lee	2019	BlockSubPay - A Blockchain Framework for Subscription-Based Payment in Cloud Service	The "BlockSubPay" methodology involves establishing a blockchain network to manage subscription-based payments in cloud services. It utilizes smart contracts to automate payment agreements and ensure secure, transparent, and traceable transactions. The system effectively handles user-provider interactions, aiming to enhance security and scalability in cloud service payments.	Blockchain Technology Smart Contracts Cloud Computing	**Enhanced Security:** The use of blockchain technology ensures secure and tamper-proof transactions, reducing the risk of fraud in subscription payments. **Automation with Smart Contracts:** Smart contracts automate payment processes, ensuring that agreements are executed reliably without the need for manual oversight.	**Complexity:** Implementing blockchain and smart contracts requires technical expertise, making it challenging for organizations without prior experience. **Regulatory Uncertainty:** The use of blockchain technology in financial transactions may face legal and regulatory challenges, varying by region and jurisdiction.	Blockchain Integration Smart Contracts Decentralization Traceability Flexibility	Includes adding features such as a refund policy and credible client usage reporting. Additionally, the plan to assess the scalability of their protocol in a seamlessly integrated environment that encompasses authentication, authorization, accounting, and payments.