

An Intelligent Gym Monitoring System Using AI

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ABSTRACT

The growth of technology and artificial intelligence has changed healthcare and fitness. Old fitness training methods, like supervision or workout apps often lack real-time monitoring, personalized guidance and accurate posture correction. This can lead to workouts, less motivation and more injuries. To solve these problems, we present an AI Fitness Trainer System. It combines computer vision, machine learning and web technologies to provide a fitness platform.

How It Works

The system monitors. Improves user fitness through real-time exercise detection, posture analysis, automatic repetition counting and personalized workout recommendations. It uses a webcam to capture video and analyse body movements. The AI module, developed using Python, OpenCV and Media Pipe libraries enables body landmark detection and posture tracking. The system evaluates user movements in time and provides immediate visual or audio feedback for incorrect posture or movement.

Features

Workout tracking, calorie monitoring, progress visualization and fitness goal management. Users can view their workout history monitor consistency and analyse performance trends. Gamification elements, such as streaks, achievements and fitness challenges are incorporated to improve motivation and user engagement. An AI-based recommendation engine suggests workout routines and diet plans according to the user's fitness level, goals and historical performance data. The web-based interface is developed using PHP and MySQL for database management and smooth interaction between users and administrators. The admin module manages user accounts, monitors workout logs tracks payments and handles user complaints. Data is securely stored in the MySQL database with authentication and session management techniques for secure access.

Experimental Results

The system demonstrates performance in real-time workout monitoring with the AI posture detection module achieving approximately 80–90% accuracy. The repetition counting mechanism produced results with minor deviations during highly dynamic movements.

Benefits

The system is accessible and cost-effective allowing users to access the platform using laptops or smartphones without requiring expensive fitness equipment or wearable devices.

Future Work

Integration, with devices, personalized workout recommendations, cloud-based analytics, mobile application support, voice-assisted feedback and AI fitness coach integration.

Conclusion

This paper presented a gym monitoring system utilizing AI for real-time exercise recognition and trainer assistance effectively detecting multiple users recognizing exercises counting repetitions, evaluating posture and providing immediate feedback.