

AI Gym Workout Plan

Prof. Leena Raut¹, Ankush Balbuddhe², Lalit Kakde³

¹Assistant Professor, Department of Computer Application

^{2,3} PG Scholar, Department of Computer Application

K.D.K. College of Engineering, Nagpur, Maharashtra, India

leena.raut@kdkce.edu.in balbudheakrishna.mca24f@kdkce.edu.in

lalitdlakade.mca24f@kdkce.edu.in

Abstract: *Physical fitness requires structured training, correct exercise posture, personalized workout plans, and continuous performance monitoring. Traditional gym training relies heavily on human trainers, which may be expensive, inconsistent, or unavailable. Many fitness applications provide pre-recorded workout plans but lack real-time posture correction and adaptive personalization.*

This paper presents an AI-Based Gym Fitness Trainer System that integrates real-time pose estimation, personalized workout recommendation, performance tracking, secure authentication, and adaptive feedback learning. The system analyzes user body posture using computer vision and deep learning techniques to detect incorrect form during exercises such as push-ups, squats, and lunges. A hybrid recommendation model generates personalized workout plans based on fitness goals, BMI, age, and historical performance data.

The system follows a modular three-tier architecture ensuring scalability, responsiveness, and secure data handling. Experimental evaluation demonstrates improved exercise accuracy, increased user engagement, and effective personalized training support.

Keywords: AI Fitness Trainer, Pose Estimation, Computer Vision, Workout Recommendation System, Posture Detection, Hybrid Recommendation, Performance Tracking

