Real-Time Fitness Monitoring with MediaPipe

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Abstract : In today's tech-driven world, where connectivity shapes our daily lives, maintaining physical and emotional health is crucial. Athletic trainers play a vital role in optimizing athletes' performance and preventing injuries. However, a shortage of trainers impacts the quality of care. This study introduces a vision-based exercise monitoring system leveraging Google's MediaPipe library for precise tracking of bicep curl exercises and simultaneous posture monitoring. We propose a three-stage methodology: landmark detection, side detection, and angle computation. Our system calculates angles at the elbow, wrist, neck, and torso to assess exercise form. Experimental results demonstrate the system's effectiveness in distinguishing between good and partial repetitions and evaluating body posture during exercises, providing real-time feedback for precise fitness monitoring.