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Fitness Training System Using Computer Vision

A dissertation
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ABSTRACT

Maintaining good health and wellbeing requires maintaining physical fitness. Yet, a lot of people started to go to gym and have trouble exercising with good form and technique, which can result in accidents, poor fitness results and this will become difficult to achieve their goals. Now the personal training also became popular in the fitness industry, and getting personal training is expensive and it is hard to find a good personal trainer. The injuries that might happens in the gym can lead to serious injuries and can affect a person's day-to-day life.

The aim of this study is to develop a system for correcting posture during exercise. To address this issue, the author proposes a machine learning approach that involves using advanced pose estimation models based on deep learning techniques to analyze exercise movements, identify posture and provide real-time feedback to correct the form and technique. To extract keypoints from the human body MediaPipe was used and for Video Processing OpenCV was used. The main goal of this research is to assist individuals who are new to fitness training.

Overall, this program provides an innovative approach to the issue of continuously maintaining proper body posture. Individuals and organizations can utilize the suggested strategy to enhance their general health and lower their chance of having injuries due to poor posture. The application's real-time feedback mechanism is helpful for prompt correction of body posture, and its user-friendly interface makes it accessible to a wide range of users.

Keywords: Fitness Training, Video Capturing, Pose Estimation, Machine Learning, Deep Learning, MediaPipe, OpenCV