

## **Abstract**

Human pose estimation has long been a challenging problem in computer vision, presenting obstacles that have sparked continuous innovation in the field. This research delves into the realm of analyzing human activities, a pursuit with applications spanning video surveillance, biometrics, assisted living, and at-home health monitoring. In our fast-paced contemporary lifestyle, the desire to exercise at home often collides with the absence of an instructor to assess proper form. To address this gap, human pose recognition emerges as a solution, laying the groundwork for a self-instruction exercise system.

This project explores a variety of machine learning and deep learning approaches to accurately classify yoga poses in prerecorded videos and real-time scenarios. The research discusses pose estimation and keypoint detection methods in detail, shedding light on the nuances of different deep learning models utilized for pose classification. The ultimate goal is to empower individuals to learn and practice exercises correctly by themselves, bridging the gap between the desire for at-home workouts and the need for expert guidance.

This abstract outlines the foundational concepts and methodologies employed in the project, offering a glimpse into the potential of creating a self-instruction exercise system through the lens of human pose estimation and classification.