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SEDENTARY SITTING POSTURE RECOGNITION WITH YOLOv3 ALGORITHM

MUHAMMAD AMIN BIN MOHAMAD RAZALI
2020470594

BACHELOR OF COMPUTER SCIENCE (Hons.)
COLLEGE OF COMPUTING, INFORMATICS
AND MATHEMATICS

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ABSTRACT

This paper discusses the prevalence of sedentary lifestyle and how it affects the sitting behaviour among computer users. Sedentary lifestyle has been adopted due to the increasing usage of computers for study or for work, which has caused an increase in sitting behaviour among computer users. The increase in sitting behaviour may lead to longer time spent in an inconsistent and potentially bad sitting postures. Sedentary sitting behaviour has caused numerous problems such as rising health issues concerning back and neck pain. Other than that, it is challenging and can be uncomfortable for computer users to break a particular problematic sitting habit. Existing solutions to sedentary sitting behaviour problems by utilizing pressure and depth sensors requires suffers from lack of calibration and are often expensive. The objective of this paper is to design, develop, and test a sitting posture recognition system using deep learning technique. Therefore, this paper discusses on the usage of deep learning techniques sitting posture recognition and presents the usage of You Only Look Once (YOLO) deep learning model, specifically the YOLOv3 model for this task. The implemented YOLOv3 model has managed to perform sitting posture recognition based on four classes: good head posture, bad head posture, good torso posture, and bad torso posture with Mean Average Precision accuracy of 87.63%. In conclusion, this paper presents a solution to recognize good and bad head and torso sedentary sitting postures and highlight the opportunities such as improving accuracy and detection speed that can be explored to further improve sitting posture recognition for future research.

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