DETECTION OF SITTING POSTURE FOR VISUALLY IMPAIRED INDIVIDUALS USING IMAGE CLASSIFICATION AND CNN ON ANDROID

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ABSTRACT

Visually impaired refers to individuals who have partial or complete loss of vision that cannot be corrected to a normal level with standard glasses, contact lenses, or medical interventions. Ensuring that visually impaired students follow lessons thoroughly poses significant challenges, especially when the instructor is also visually impaired. This research addresses this issue by developing a system for detecting sitting postures using image classification and convolutional neural networks (CNN) on Android devices. The proposed method employs the SqueezeNet CNN model to classify landmark values generated from MediaPipe. The model was trained on a dataset comprising 1850 images of various sitting postures, with a training and testing split of 80% and 20% respectively. Evaluation of the model is done using a confusion matrix which demonstrated an accuracy of 99.9%, with precision, recall, specificity, and F1 scores nearing 100%. This system aims to provide visually impaired teachers with accurate information about their students' behaviors, enhancing the teaching and learning experience in classrooms through easier means.

Keywords : Convolutional Neural Network (CNN), SqueezeNet, Image Classification, MediaPipe, Sitting Posture Detection