EyeSee: Real-Time Object Detection Application for the Visually Impaired Using TensorFlow Lite and EfficientDet with Convolutional Neural Networks

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ABSTRACT

A real-time object detection mobile application for visually impaired individuals using TensorFlow Lite aims to detect objects and Indonesian currency while providing language selection and other supporting features. Deep learning models for object detection, particularly Convolutional Neural Networks, have been an active field in computer vision research for many years. However, developing object detection applications for mobile devices with limited computational power might be challenging. The solution presented in this report utilizes TensorFlow Lite, a lightweight variant of TensorFlow created for mobile and embedded devices. The application uses EfficientDet, a highly efficient object detection model that enables scaling of network width, depth, and resolution in a balanced manner, resulting in improved accuracy and efficiency. The implementation of the application using TensorFlow Lite and EfficientDet has resulted in a highly precise and reliable object detection model suitable for mobile devices. The application also includes additional features to improve usability, such as Indonesian currency detection. The future work for this application includes improving the Indonesian currency detection feature, expanding language options, and training custom models for specific objects or features. This application has the potential to significantly improve the daily experiences of visually impaired people and enhance their independence.

Keywords*—Object Detection, Convolutional Neural Networks, TensorFlow Lite, Real-Time, Visual Impairment*

DEDICATION

For myself and my family.

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