ABSTRACT

Communication is a basic human need, including for people with hearing and speech impairments. This study was conducted at SLB Putra Mandiri Surabaya, which showed that many students still do not have a good command of SIBI sign language. To address this issue, a mobile learning and sign language translation application based on machine learning was developed using the prototype method. This method was chosen because it allows for flexible development and is based on user feedback. The main feature of this application is a real-time translator camera that uses Convolutional Neural Network (CNN) to recognize hand gestures. Feature extraction is performed using MediaPipe, while model training uses a SIBI gesture dataset from Kaggle and manual input. The model is trained using TensorFlow and implemented through a Flask API integrated into the Flutter application. In addition to the translator feature, the app provides a learning module in the form of a sign language alphabet dictionary, instructional videos, and educational quizzes. Test results show that the app can accurately recognize gestures and improve students' understanding of SIBI. The expected outcome is the creation of an educational app that can enhance the communication skills of deaf students, facilitate the learning process of SIBI, and enrich their social interactions with their surroundings in a more inclusive manner.

Keywords: SIBI, Machine learning, Flutter, MediaPipe, CNN, Prototype Method, SLB.