

ABSTRACT

*The communication gap between the hearing and Deaf communities in Indonesia presents a significant challenge due to the limited accessibility of sign language interpreters. To bridge this gap, a real-time Indonesian Sign Language (BISINDO) detection system was developed. This project aims to design and implement a detection engine capable of translating sign language gestures into text. The methodology employed is a computer vision-based approach utilizing the MediaPipe Holistic framework to extract 1662 landmark features from pose, face, and hands. The sequential data from these features are then processed by a deep learning model with a stacked Long Short-Term Memory (LSTM) architecture for classification. Two systems were developed: one for dynamic words and a more lightweight model specifically for static alphabet gestures. Quantitative testing results demonstrated high performance, with the main Holistic model achieving **99.76%** accuracy and the alphabet detection model achieving **98.59%** accuracy on the test data. The successful development and validation of this system highlight its potential as a foundation for an effective and accessible communication support tool.*

Keywords: Indonesian Sign Language, Real-Time Detection, Deep Learning, MediaPipe, LSTM