

Abstract

Based on data from the Coordinating Ministry for Human Development and Culture of the Republic of Indonesia in 2023, the number of people with disabilities in Indonesia is 22.97 million, who need help in communicating. Although the Sistem Isyarat Bahasa Indonesia (SIBI) has helped, there is still a need for technological breakthroughs to maximise the effectiveness of communication with deaf people.

The utilization of image processing technology as a sign language translator is a crucial step in enhancing communication with deaf individuals. By converting hand images into text using the key point positions of the hand in each image, this technology offers significant potential to facilitate smoother and more effective interactions.

This research proposes the use of Convolutional Neural Network (CNN) algorithm in Deep Learning method to act as a classifier for image data. The CNN model used is a Residual Neural Network (ResNet) architecture with 50 layers, including several residual blocks consisting of convolution layers, batch normalisation, and ReLU activation function. This model is expected to identify complex patterns and features from hand image data to translate sign language.

This research has successfully developed an application capable of translating sign language consisting of 26 letters with a high speed and achieved an accuracy rate of 100% and a loss rate of 0.0005. These results demonstrate significant potential for the application of technology in supporting inclusive communication with the deaf community in Indonesia.

Keywords: deaf community, Sistem Isyarat Bahasa Indonesia (SIBI), image processing technology, Convolutional Neural Network (CNN), sign language translator application
