International Journal of Advances in Intelligent Informatics ISSN 2442-6571 Vol. 10, No. 2, May 2024, pp. 348-358 348 https://doi.org/10.26555/ijain.v10i2.1445 http://ijain.org ijain@uad.ac.id Detecting signal transition in dynamic sign language using the R-GB LSTM method Ridwang a,1,* , Adriani b,2, Rahmania b,3 , Mus'ab Sahrim b,4, Asep Indra Syahyadi c,5, Haris Setiaji d,6 a Universitas Muhammadiyah Makassar, Jl. Sultan Alauddin No.259, Makassar 90221, Indonesia b Universiti Sains Islam Malaysia (USIM), Bandar Baru Nilai, 71800 Nilai Negeri Sembilan, Malaysia c Universiti Islam Negeri Alauddin Makassar, Jl. Sultan Alauddin No.63, Gowa 92113, Indonesia d Institut Agama Islam Negeri Metro Lampung, Jl. Ki Hajar Dewantara No.15A, Kota Metro 34112 Indonesia 1 ridwang@unismuh.ac.id; 2 adriani@unismuh.ac.id; 3 rahmania.rahmania@unismuh.ac.id; 4 musab@usim.edu.my; 5 asep@uin-alauddin.ac.id; 6 harissetiaji@metrouniv.ac.id * corresponding author 1. Introduction

ABSTRAK

Sign language is the primary language for many deaf people. It is not merely an alternative form of spoken language but a fully-fledged language with its own grammar, syntax, and vocabulary [1]. As such, recognizing and understanding sign language is crucial for facilitating effective communication with deaf individuals. SLR technology bridges the communication gap between deaf and hearing people. By converting sign language into a form that machines or electronic devices can understand, such as text or speech, SLR allows deaf people to communicate with those who do not know sign language. This is especially important in situations where a sign language interpreter is not available, such as when communicating with people who are not proficient in sign language or when using technology such as telephones or computers [2]. SLR also facilitates the development of applications and technologies that ARTICLE INFO ABSTRACT Article history Received December 9, 2023 Revised March 26, 2024 Accepted April 7, 2024 Available online May 31, 2024 Sign Language Recognition (SLR) helps deaf people communicate with normal people. However, SLR still has difficulty detecting dynamic movements of connected sign language, which reduces the accuracy of detection. This results from a sentence's usage of transitional gestures between words. Several researchers have tried to solve the problem of transition gestures in dynamic sign language, but none have been able to produce an accurate solution. The R-GB LSTM method detects transition gestures within a sentence based on labelled words and transition gestures stored in a model. If a gesture to be processed during training matches a transition gesture stored in the pre-training process and its probability value is greater than 0.5, it is categorized as a transition gesture. Subsequently, the detected gestures are eliminated according to the gesture's time value (t). To evaluate the effectiveness of the proposed method, we conducted an experiment using 20 words in Indonesian Sign Language (SIBI). Twenty representative words were selected for modelling using our R-GB LSTM technique. The results are promising, with an average accuracy of 80% for gesture sentences and an even more impressive accuracy rate of 88.57% for gesture words. We used a confusion matrix to calculate accuracy, specificity, and sensitivity. This study marks a significant leap forward in developing sustainable sign language recognition systems with improved accuracy and practicality. This advancement holds great promise for enhancing communication and accessibility for deaf and hard-of-hearing communities