Development Of An Indonesian Sign Language Recognition System Using Mediapipe Hands And Face Mesh Based On Temporal Convolutional Network (TCN)

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ABSTRACT

Indonesian Sign Language (SIBI and BISINDO) is used by deaf people to communicate, but public understanding of it remains limited. This research aims to develop a real-time Indonesian sign language recognition system as an interactive learning medium at Kedai Susu Tuli (K-Suli), which has so far relied only on posters and picture dictionaries. The system uses MediaPipe Hands and Face Mesh to extract hand and face landmarks, which are classified using a Temporal Convolutional Network (TCN) with four models: SIBI alphabet, BISINDO alphabet, numbers, and words. Each frame is extracted into 306 features and arranged into sequences of 30 frames. The system is implemented as a website built with Flask and ReactJS, including a sign dictionary menu. Test results show accuracies of 96.50% for the SIBI alphabet, 83.56% for the BISINDO alphabet, 95.74% for numbers, and 97.41% for words, while User Acceptance Testing (UAT) recorded a user acceptance rate of 92.12%. Therefore, this system can serve as an interactive sign language learning medium at K-Suli.

KEYWORDS: *Sign Language, SIBI, BISINDO, Temporal Convolutional Network (TCN), MediaPipe Hands, Face Mesh, Real-time.*