SIGN LANGUAGE TRANSLATION USING DEEP LEARNING

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Hearing-impaired individuals encounter substantial challenges in daily life, often facing communication barriers in social, educational, and professional environments. These obstacles can lead to isolation, limited access to information, and reduced opportunities. While sign language is essential for communication within the hearing-impaired community, its reliance on visual cues can exacerbate the divide between those who use sign language and those unfamiliar with it. These ongoing challenges highlight the urgent need for innovative solutions that bridge the communication gap. Sign language translation is a crucial technology to bridge communication gaps for the hearing-impaired community. This research article explores a deep learning approach to sign language translation, leveraging advanced image processing techniques to capture and interpret sign language gestures. The proposed model integrates Convolutional Neural Networks (CNNs) for feature extraction and image recognition, combined with Long-Short Term Memory (LSTM) networks to handle the temporal dynamics of sign language sequences. The CNN architecture processes visual input, identifying key features from images or video frames that correspond to specific signs. These features are then passed to the LSTM, which captures the temporal dependencies between consecutive gestures, enabling accurate translation of sign language into text or spoken language. The effectiveness of the model is evaluated on benchmark datasets, demonstrating its potential in real-time sign language translation. By harnessing the power of deep learning, this study aims to provide an efficient and scalable solution for translating sign language, thereby enhancing communication accessibility for the hearing-impaired. The integration of CNNs and LSTMs represents a significant advancement in the field, offering a robust framework that can be adapted to various sign languages across different regions. This work contributes to the broader effort of making technology more inclusive, ensuring that the hearing- impaired community can fully participate in everyday communication.

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