Development of a Language Translator Model for Yoruba Language using Bidirectional Long Short-Term Memory Encoder

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Abstract:

Nigeria is a nation of vast ethnic diversity, encompassing a multitude of cultures, languages, and values. These differences often present significant communication barriers among its various ethnic groups. In response, Google has integrated several Nigerian languages into its translation model. This study focuses on the development of an automatic speech recognition (ASR) system for theYoruba language, one of Nigeria's indigenous languages. A speech dataset related to medical domain was collected from native Yoruba speakers and subjected to preprocessing to eliminate background noise introduced during the recording process. The preprocessed data was transformed into a speech spectrogram, serving as input to a bidirectional long short-term memory (BiLSTM) model. The hyperparameters of the BiLSTM model were optimized for improved performance. The translation model was evaluated using metrics such as BLEU, METEOR,and ROUGUE. Results demonstrated significant improvements in the ASR model's ability to accurately transcribe and translate Yoruba language speech. This advancement in translation accuracy highlights the potential for better cross-linguistic communication among Nigeria's ethnic groups, fostering greater inclusivity and understanding. This study contributes to ongoing efforts to incorporate underrepresented languages in global translation models, addressing the challenge of language diversity in multilingual societies.