

READ

Developing a South African ART with Fine-tuned Mispronunciation Detection, Voice Detection, Multi-speaker Detection and Text Generation



Overview

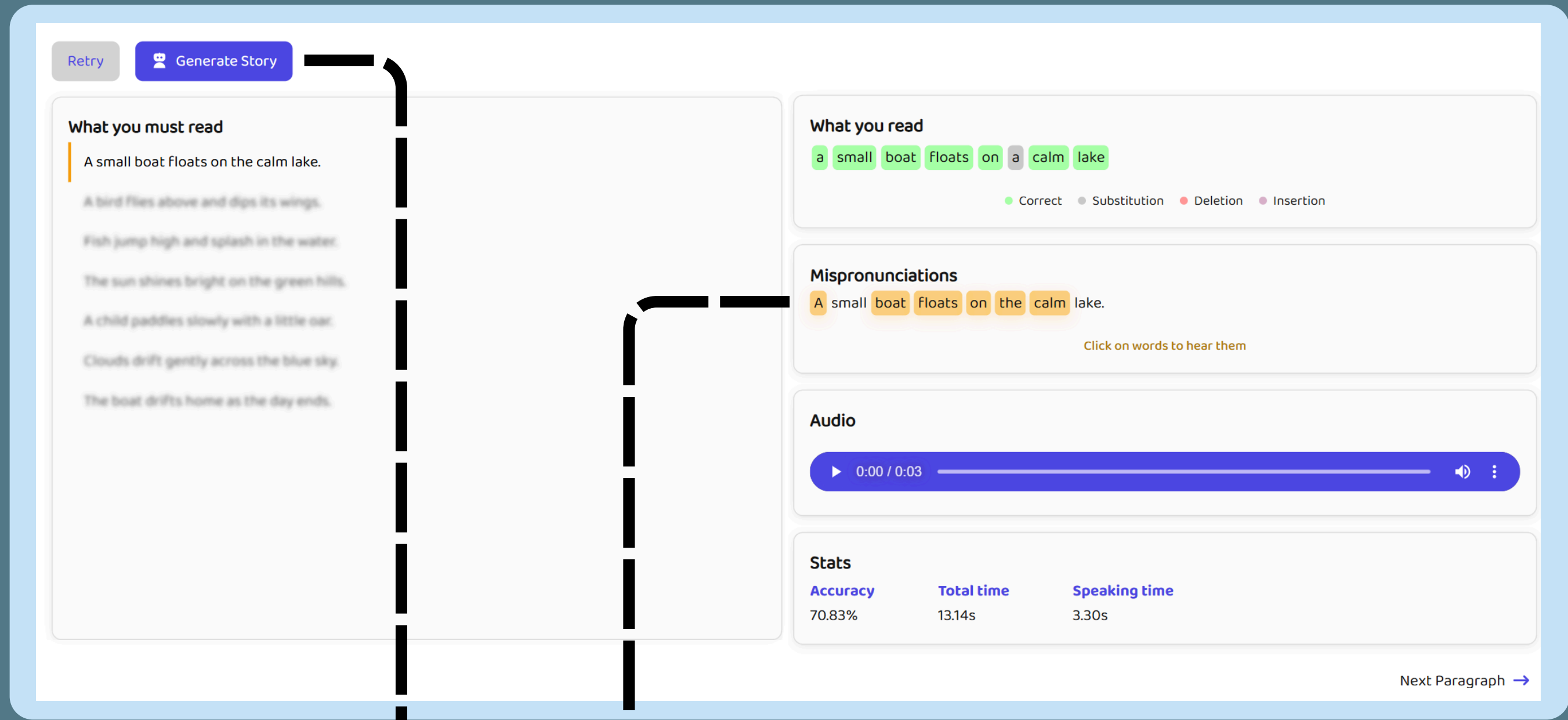
Automatic Reading Tutors (ART) pose a practical solution to improving literacy levels in South Africa. Most reading tutors, however, aren't freely available, and are not adapted to accurately understand different South African English accents. Therefore, our project aims to use open source resources to develop a freely available ART for South Africans.



Improved Reading Tutor

AIM: To develop a usable web-based Automatic Reading Tutor that makes use of voice activity detection, voice-type classification and state-of-the-art transcription with real-time feedback.

METHOD: A Next.js frontend together with a Django backend server that uses the relevant mispronunciation detection and story generation models and libraries.



Story Generation

AIM: Apply Answer Set Programming (ASP) and auto-regressive transfer to open-source, fine-tunable LLMs to automatically generate appropriate children's stories in English for students in Grades 1-3.

METHOD: A 3 stage pipeline culminating in an ASP-Auto-regressive generation method and comparing to a baseline.

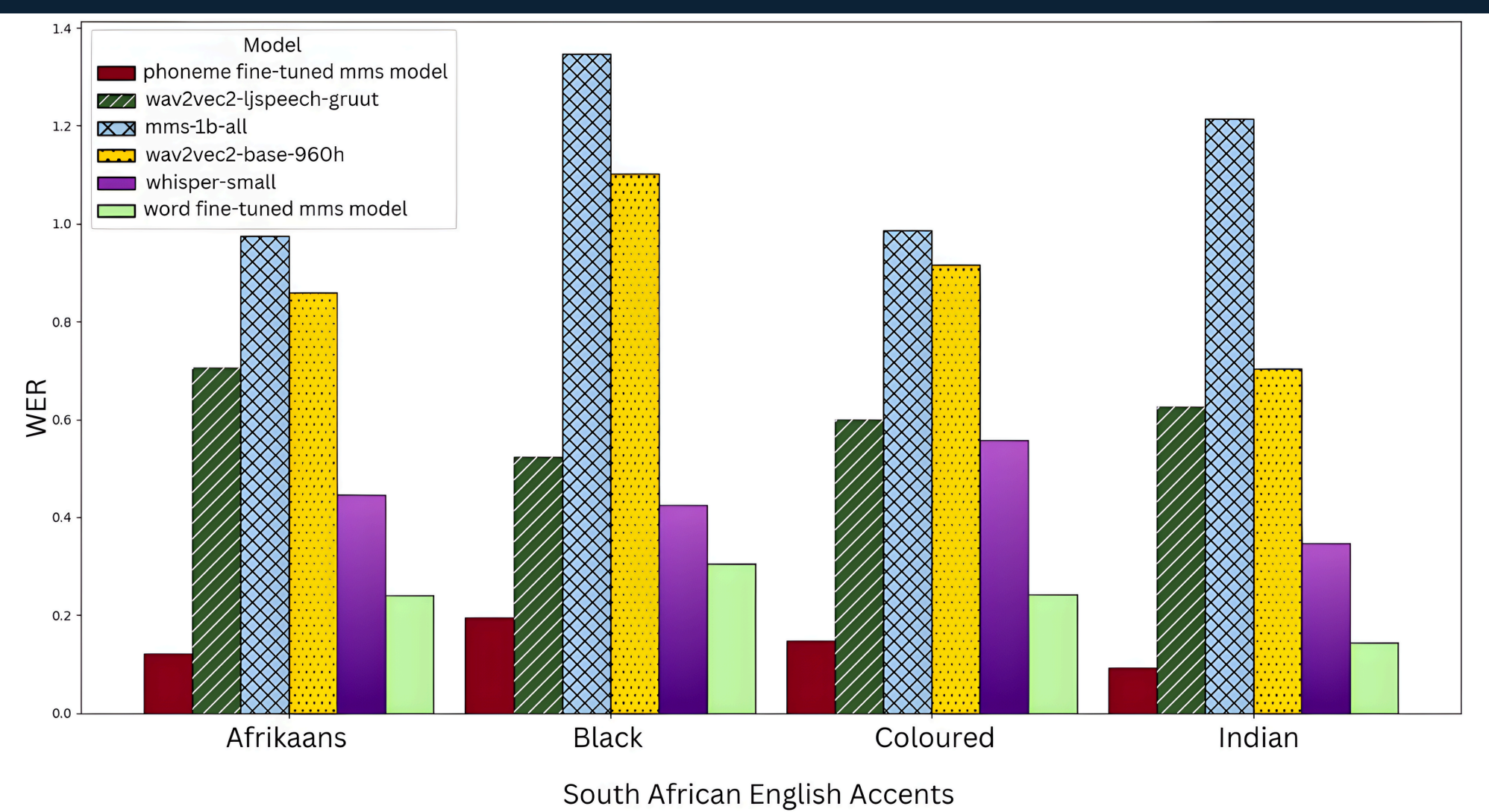
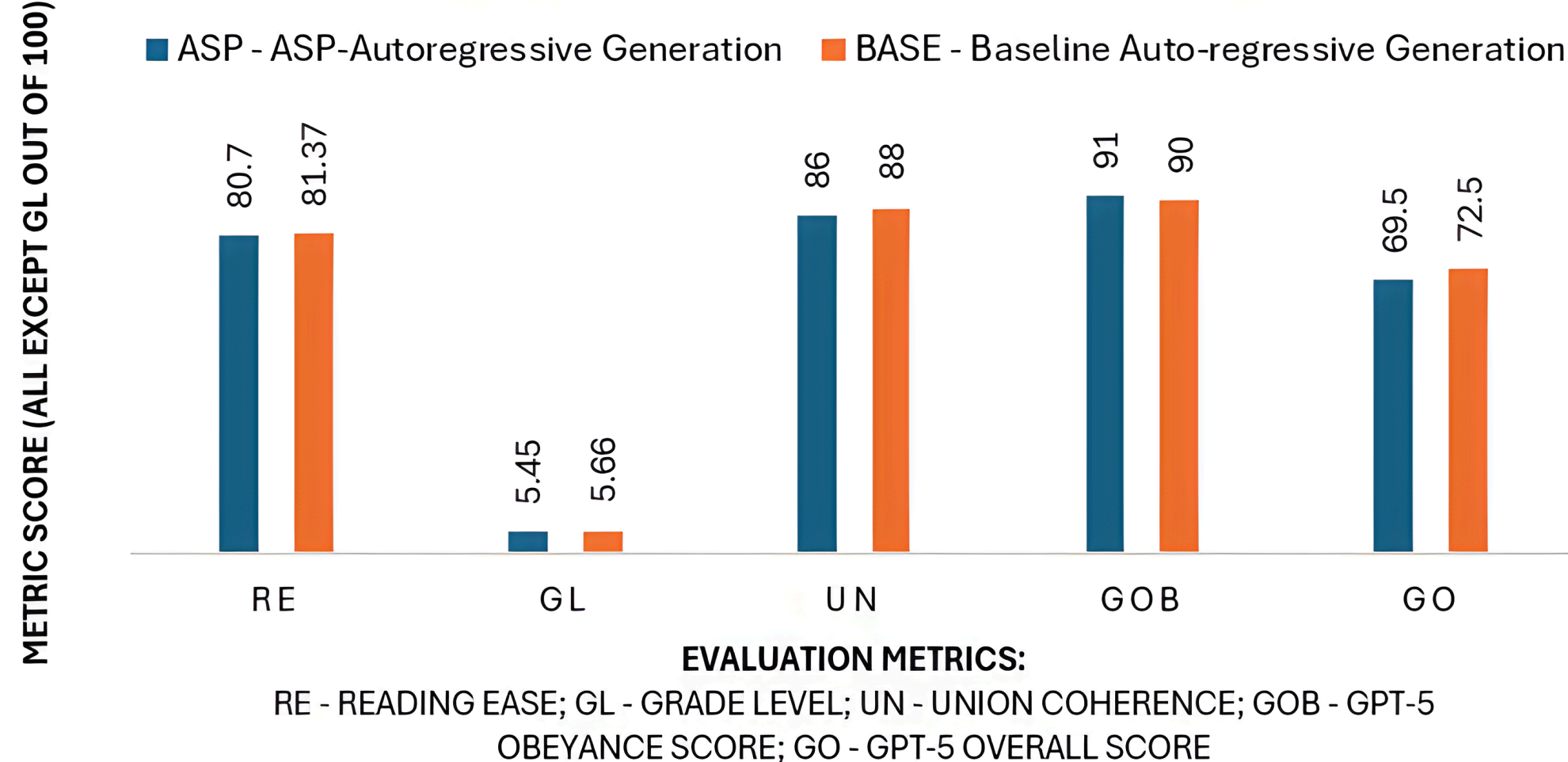


Mispronunciation Detection

AIM: To Develop Automatic Speech Recognition (ASR) mispronunciation detection models for South African English accents.

METHOD: We do this by fine-tuning existing ASR models on South African English accented speech data using supervised learning to predict text on a phoneme level.

STORY GENERATION RESULTS COMPARISON



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