

Camera Ready Summary

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21st International Conference on Advances in ICT for Emerging Regions

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58

Paper Title

English Language Trainer for Non-Native Speakers using Audio Signal Processing, Reinforcement Learning, and Deep Learning

Abstract

Lack of basic proficiency and confidence in writing and speaking in English is one of the major social problems faced by most non-native English speakers. Although the general adult literacy rate in Sri Lanka is above average by world standards, the English literacy rate is just 22% among the Sri Lankan adult population. Many individuals face setbacks in achieving their career and academic goals due to these language barriers. In a world where English has become a compulsory requirement to pursue higher education, career development, and performing day-to-day activities, "English Buddy" is a software solution developed to enhance the English learning experience of individuals in a more personalized and innovative way. The system provides an all-in-one solution while filling major research and market gaps in existing solutions in the e-learning domain. The system consists of a personalized learning environment, automated pronunciation error detection system, automated essay evaluation process, automated descriptive answer evaluation component based on semantic similarity, and real-time course content rating system. English Buddy is implemented using state-of-the-art technologies such as Audio Signal Processing, Reinforcement Learning, Deep Learning, and NLP. The LSTM, Sentiment Analysis, and Siamese network models have gained accuracy scores of 0.93, 0.92, and 0.81 respectively. Further, the UAT results proved that the personalized recommendations and pronunciation error detection processes are accurate and reliable. This research has been able to overcome the limitations of most existing solutions that follow traditional approaches and provide better results compared to the recent studies in the e-learning research domain.

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