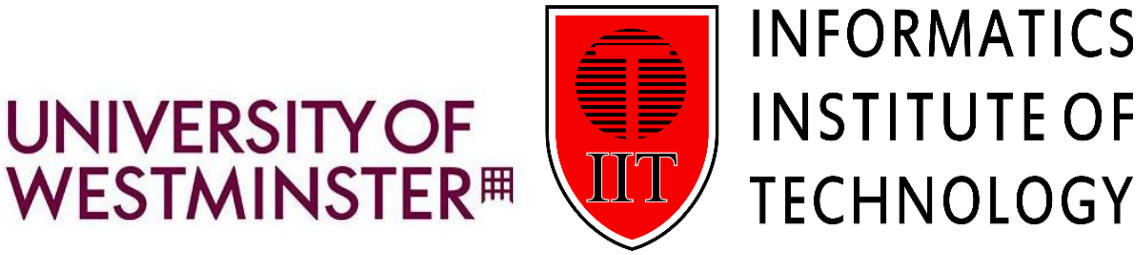

INFORMATICS INSTITUTE OF TECHNOLOGY

In Collaboration with

UNIVERSITY OF WESTMINSTER (UOW)

MSc in Advanced Software Engineering

Automatic voice emotion recognition emergency system based on Sinhala Language

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ABSTRACT

Current developments in speech emotion recognition, aided by machine learning and artificial intelligence, promise to revolutionize communication channels, especially in emergencies. Nevertheless, these advancements primarily target widely spoken languages, leaving a significant need for systems that cater to languages like Sinhala.

the research project aims to address the gap in the field of automatic voice emotion recognition (AVER) by introducing a system specifically designed for the Sinhala language. The procedure includes identification and extraction of relevant acoustic features, and the design and implementation of a machine learning model for emotion classification. The system is equipped to recognize critical emotional states such as stress, fear, calmness, and urgency from Sinhala speech. Additionally, it is designed to extract incident-related information from the emotion-infused speech and relay this vital data to the appropriate emergency services, significantly enhancing the effectiveness and efficiency of emergency response in Sri Lanka.

The system achieved an accuracy of 79% in identifying voice emotions and a higher accuracy of 81.3% in relaying information to appropriate emergency services. These results underline the system's practical potential and robust performance. This research not only emphasizes the importance of developing inclusive, language-specific technology but also opens the door for similar advancements in other underrepresented languages, contributing to the overarching aim of improving global emergency response mechanisms.

Subject Descriptions:

- Computing methodologies → Artificial intelligence → Natural Language Processing
- Computing methodologies → Machine learning → Machine learning approaches → Neural networks

Keywords: Emotion Recognition, Emergency Response, Machine Learning, Incident Information Extraction, Speech Analysis. NLP