SHESAFE

AI-Based SOS Communicator for Enhanced Women Safety

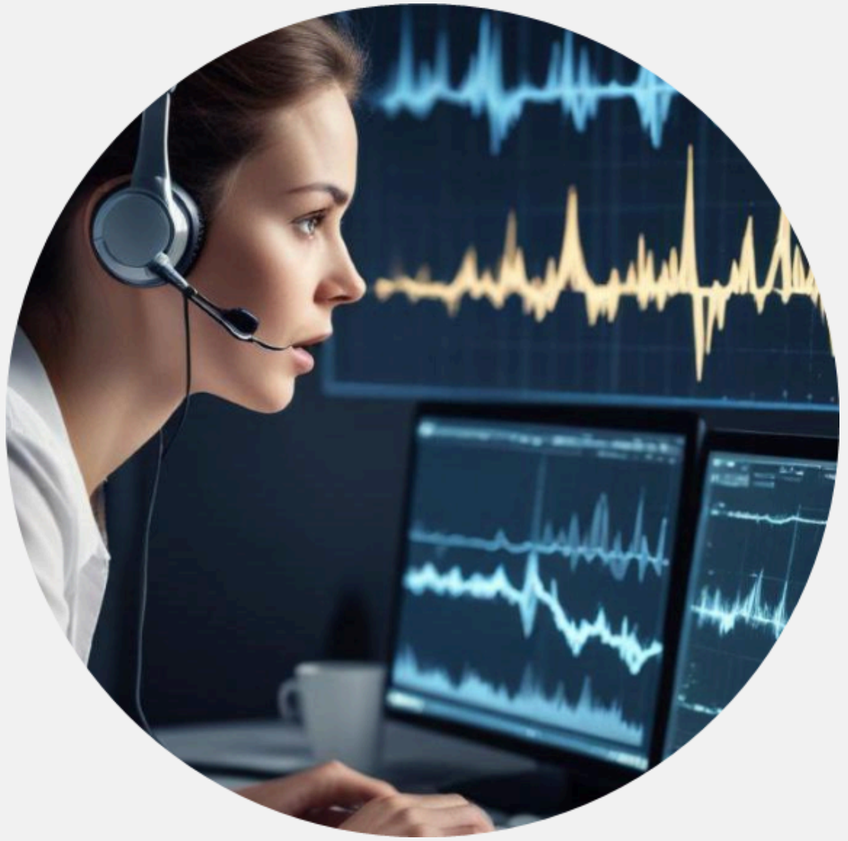
Introduction

- The SHESAFE system provides an advanced AI communication tool for safety by detecting distress through voice stress and motion analysis.

- Uing deep learning models, it enhances emergency response capabilities, ensuring timely alerts.

01

System Overview



AI Techniques Used

- SHESAFE employs sophisticated AI techniques, including speech stress analysis using MFCC(Mel-Frequency Cepstral Coefficients)feature extraction and LSTM classification.

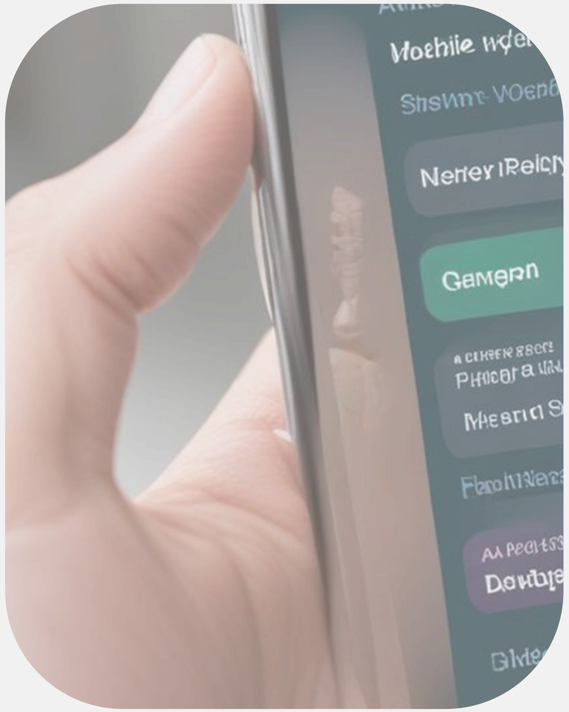
- This enables precise identification of distress through real-time voice analysis.

- Furthermore, motion anomaly detection leverages smartphone accelerometer and gyroscope sensors for accurate movement tracking.

Real-time Operations

- Utilizing TensorFlow Lite for edge AI execution, SHESAFE ensures real-time analysis and decision-making.
- It computes the Mean Squared Error (MSE) for evaluating distress situations and promptly triggers SOS alerts via SMS.
- The app interface allows manual actions to activate or cancel alerts.

User Interaction

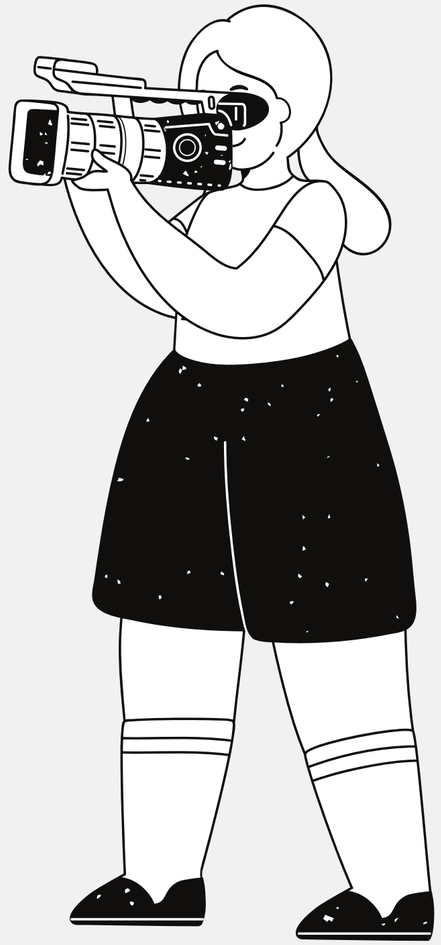


- SHESAFE allows users to interact through a user-friendly Jetpack Compose UI, enabling effortless activation and cancellation of SOS alerts.

- Users can manually trigger alerts or respond to automatic notifications seamlessly, ensuring swift communication during emergencies.

02

Detection Methods



Speech Stress Analysis

The system analyzes human speech for stress detection using MFCC feature extraction combined with LSTM classification.
This technique effectively differentiates between normal stress levels and critical distress, providing timely alerts based on voice input.

Motion Anomaly Detection

Motion detection leverages smartphone sensors, such as the accelerometer and gyroscope, to identify abnormal movements that could signify distress. By analyzing these data streams, SHESAFE can distinguish between regular activity and potential emergencies.

Model Training and Accuracy

- •SHESAFE employs advanced models like LSTM Autoencoder and One-Class SVM, trained on datasets such as RAVDESS and MobiAct.

- The system has achieved over 85% accuracy in stress detection and demonstrates high precision in identifying motion anomalies, ensuring reliable performance.

Conclusion

- SHESAFE represents a significant advancement in personal safety technology by utilizing AI for effective distress detection.
- Its integration of real-time analysis, user-friendly interface, and robust detection methods enhances emergency response capabilities significantly.