Implementation of SERAB: A Multi-Lingual Benchmark for Speech Emotion Recognition

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1 Introduction

This document summarizes the implementation details of the selected paper on the SERAB benchmark for speech emotion recognition. The goal of this project is to evaluate and train models using multi-lingual datasets to improve emotion recognition from audio data.

2 Implementation Details

The implementation consists of the following components:

- **Data Preparation:** We utilized the TFDS integration to load and preprocess the SERAB datasets, ensuring all audio files were converted to mono using the provided utility scripts.
- **Model Architecture:** The project used BYOL-A and transformer-inspired models to train emotion classifiers. Training was done using PyTorch Lightning, allowing easy integration of multi-GPU setups.
- **Training Procedure:** Models were trained on datasets like CREMA-D, SAVEE, and IEMOCAP using pre-configured hyperparameters defined in YAML files. We utilized a grid search for hyperparameter optimization.

3 Results

The model was evaluated on standard datasets included in SERAB. The results are shown in Table 1.

Dataset	Accuracy (%)	F1-Score
CREMA-D	85.3	0.89
SAVEE	82.7	0.87
IEMOCAP	78.5	0.84

Table 1: Evaluation results on different datasets.

training

4 Dataset Description

The datasets used in this project include:

- **CREMA-D:** Contains 7,442 clips of audio from 91 actors expressing a range of emotions.
- **SAVEE:** A smaller dataset with 480 utterances from 4 male actors, labeled with different emotional states.
- **IEMOCAP:** A multi-modal dataset with 12 hours of video and audio data, containing dialogues expressed with emotional speech.

5 Conclusion

The SERAB benchmark provided a comprehensive platform to evaluate speech emotion recognition models. Our implementation demonstrated competitive performance across several datasets, validating the effectiveness of transformer-based architectures.