

Aggression Detection in Audio Data

Objective:

To develop a system that detects aggression in audio data, including tonal analysis and NLP-based sentiment analysis.

Research Phase

Problem Statement: The project aims to detect aggression in audio data through tonal analysis and NLP-based sentiment analysis.

Key Findings:

- Identified existing solutions in the field, including open-source algorithms and commercial products.
- Categorized solutions into audio-based and NLP-based approaches.
- Evaluated pros and cons, accuracy, computational requirements, and cost projections based on a dataset of 100,000 minutes.

Data Phase

Data Collection

Data Sources: Detailed sources of audio data, including data volume and diversity.

Data Preprocessing

Data Cleaning: Steps taken to clean and preprocess the data, handling issues like noise and format conversion

Model Development Phase

Feature Engineering

- **Feature Extraction:** Description of the method used for feature extraction, ensuring alignment with the chosen approach (audio-based or NLP-based).

Model Selection

- **Algorithm Selection:** Chosen machine learning algorithms and reasons for selection.
- **Hyperparameter Tuning:** Details on hyperparameter tuning and optimization efforts.

Model Evaluation

- **Evaluation Metrics:** Defined evaluation metrics, such as F1-score, precision, recall, and ROC-AUC.
- **Cross-Validation:** Explanation of cross-validation techniques employed to validate model performance.

Implementation Phase

Code Documentation

extract_features Function:

- - Purpose: Describe the purpose of the function.
 - Inputs: Specify input parameters, their types, and expected values.
 - Usage: Provide examples and use cases for the function.

User Manual

- **Input Audio Files:**
 - Instructions for users on how to input audio files.
 - Accepted audio file formats and requirements.