

# **ECE 49595NL Project Proposal**

## **Song Lyric Extraction**

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<https://github.com/MadSons/Song-Lyric-Extraction>

### Problem statement

Although lyrics are widely available for popular songs, it is often difficult to determine lyrics when listening to songs when artists don't provide lyrics. Instruments, accents and other factors make it difficult to listen and understand the words in a given song. Also, some people would like to know the lyrics of a song that they don't know. This problem can be solved with a song lyric extraction machine learning model.

### Summary/Abstract

The song lyric extraction project's goal is to take the audio of a song and provide the lyrics. Using the audio file, we will train a model to interpret what is said by the singer and provide users a transcript of the song's lyrics.

### Requirements/Implementation

1. Data Collection
  - We need to get a data set of songs and corresponding lyrics so that we can train our model.
2. Audio Feature Extraction
  - A library to process audio files to get a format that we are able to train our model with. This includes either Mel-Frequency Cepstral Coefficients (MFCCs) or spectrogram representations to extract features from the audio.
3. Text Data Preprocessing
  - Preprocess the lyrics data by tokenizing, cleaning, and encoding it into a format suitable for NLP tasks.
4. Data Alignment
  - Align the audio features with the corresponding lyrics.
5. Model Architecture
  - Choose a suitable machine learning architecture such as a combination of convolutional/recurrent neural networks, (CNN/RNN), or transformers.
6. Model Training
  - Train the model using aligned audio and text. This step involves optimizing the model weights to minimize the prediction error. A suitable loss function must also be chosen.
7. Evaluation
  - Our model must have low enough error that the predictions are within a reasonable threshold. Model will be evaluated on a testing set that has not been seen by the model, and multiple metrics will be used for evaluation.
8. Saving models
  - To save our model for later use we will employ the python pickle library.