

# DELIVERABLE 1

**Dataset:**

I will be using the IDMT-SMT-Chords dataset.<sup>1</sup> This dataset contains 849 unique 2 second, MIDI generated chord classes of guitar and non-guitar instruments. The Non-Guitar category includes all chord types in all possible root note positions and inversions. The Guitar category includes chord voicings based on barre chords with root notes on the low E, A, and D strings. I will rely on the conference paper found in the references to inspire and guide me.

**Methodology:**

In order to process audio, the signals must be converted into Short-time Fourier Transform (STFT) magnitude spectrogram. Logarithmic magnitude compression will also be implemented to “standardize” or get rid of the effects of dynamics.

Using this dataset, the model shall be trained to classify a user inputted chord into its correct voicing/augmentation. If possible, an additional prediction of the model would be to present the other possible voicings and/or provide guitar tablature for the user input.

As advised by Nadar et al., confusion matrices for chord root pitch class, chord types on isolated recordings, and chord types on mixed recordings shall be used to evaluate automatic chord recognition (i.e. the model).

The final conceptualization of this project will behave in a similar way to how “Shazam” would. The user will play a recording of a chord (or sequence of chords) and the model will predict the voicing of the chord in a visual manner (specific voicing and guitar tablature).

**Application:**

Ideally, I would love to incorporate the final product into a mobile application to promote convenience (in the same manner of having an instrument tuner application). I don’t have experience with developing mobile application but, if time allows, I will try to learn how to build a simple application for the purpose of this project. However, I will most likely be implementing this project in a simple webapp that will allow microphone input, file upload, or just showcase preloaded recordings (similar to the webapp linked in the “MAIS 202 - PROJECT DELIVERABLE 1” description).

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**Reference:**

1. Nadar, C.-R.; Abeßer, J.; Grollmisch, S. In *Towards CNN-based acoustic modeling of seventh chords for automatic chord recognition*, International Conference on Sound and Music Computing. Málaga, Spain, 2019.