University of Colorado **Boulder**

Music Genre Classification with Deep Learning

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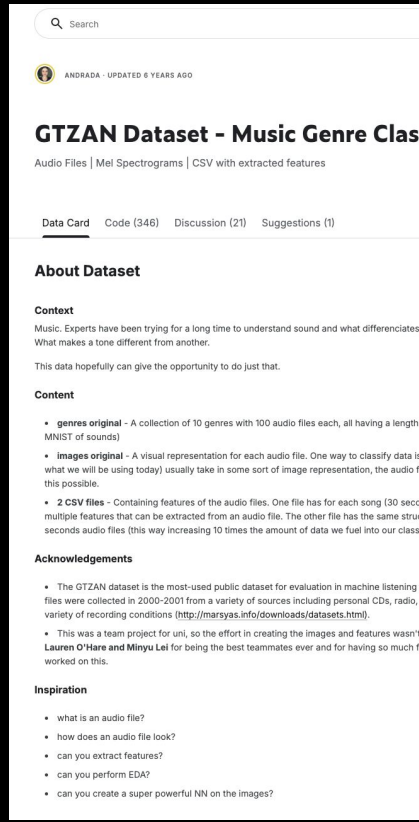
I'm a Director of User Experience at Google, and an aspiring student of Artificial Intelligence at University of Colorado Boulder, but I'm also a musician with 25 years of guitar playing experience.

I play anything from jazz to metal

I found on Kaggle the GTZAN Dataset for Music Genre Classification. It's fascinating!

The dataset consists of: 1,000 wav files (100 per 10 genres), generated spectrogram images, CSV file with numeric features for each sample.



The problem

While it's often easy to recognize a genre of music by ear, I was curious if a machine can do it too. This can be useful for automatic classification for services such as YouTube Music or Spotify, but also can be a foundation for all sorts of advanced music tooling (e.g. genre specific track separation).

I decided to use deep learning to solve this issue and build a music genre classifying neural network.

Goal

Build a deep learning model effectively classifying music to genres by analysing spectograms.

Research Plan

1. **EAD**. After loading the data set I'm going to thoroughly evaluate it. I'll pay a lot of attention to how balanced the data set is (number of observations per type) and visual inspection of spectrograms
2. **Data processing.** I assume that I'll have to process the data to clean it up and prepare it for training.
3. **Multilayer perceptron training.** As a baseline of performance I'm going to train a simple neural net with the numerical features data. I'll use it as a comparison point for my CNN.
4. **CNN training.** I'll define a custom CNN and train it on spectrograms.
5. **CNN optimization.** I'll keep optimizing the CNN until I effectively beat the result of the Multilayer perceptron