CLASSIFICATION OF MUSIC BY GENRE

Final Project - Machine Learning 2020-1

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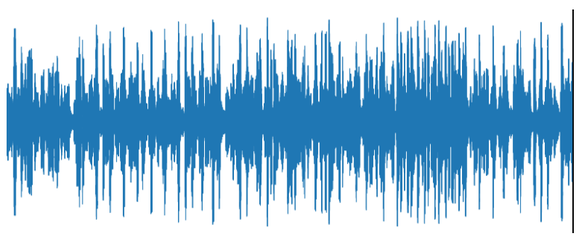
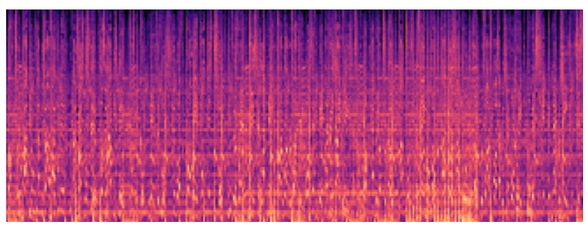
The automatic classification of musical genres is an important tool in the organization of large audiovisual libraries. However, the variety of features in songs belonging to the same musical genre make this task difficult. That's why we propose different methods for the extraction of characteristics with a subsequent classification using a deep learning model.

Dataset: The open dataset FMA (Free Music Archive) has 8000 songs of 30 seg each, distributed in 8 genres: Electronic, Experimental, Folk, Hip-Hop, Instrumental, International, and Pop.



Amplitude vs Time



Mel Spectrogram

Objective:

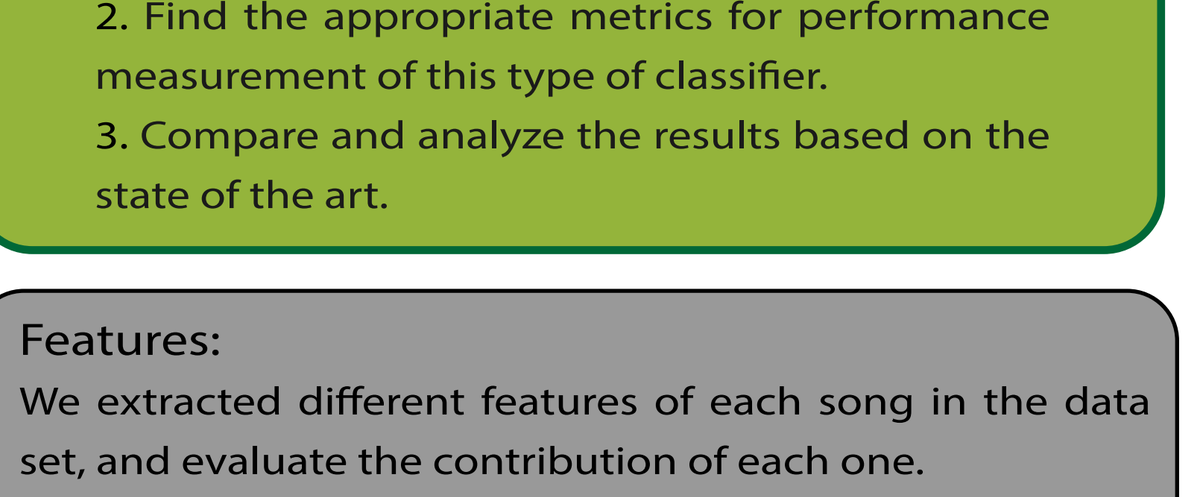
Crate a classifier of songs by musical genre, based on FMA data.

1. Create a classifier of songs that from the audios identifies the genre to which it belongs.
2. Find the appropriate metrics for performance measurement of this type of classifier.
3. Compare and analyze the results based on the state of the art.

Features:

We extracted different features of each song in the data set, and evaluate the contribution of each one.

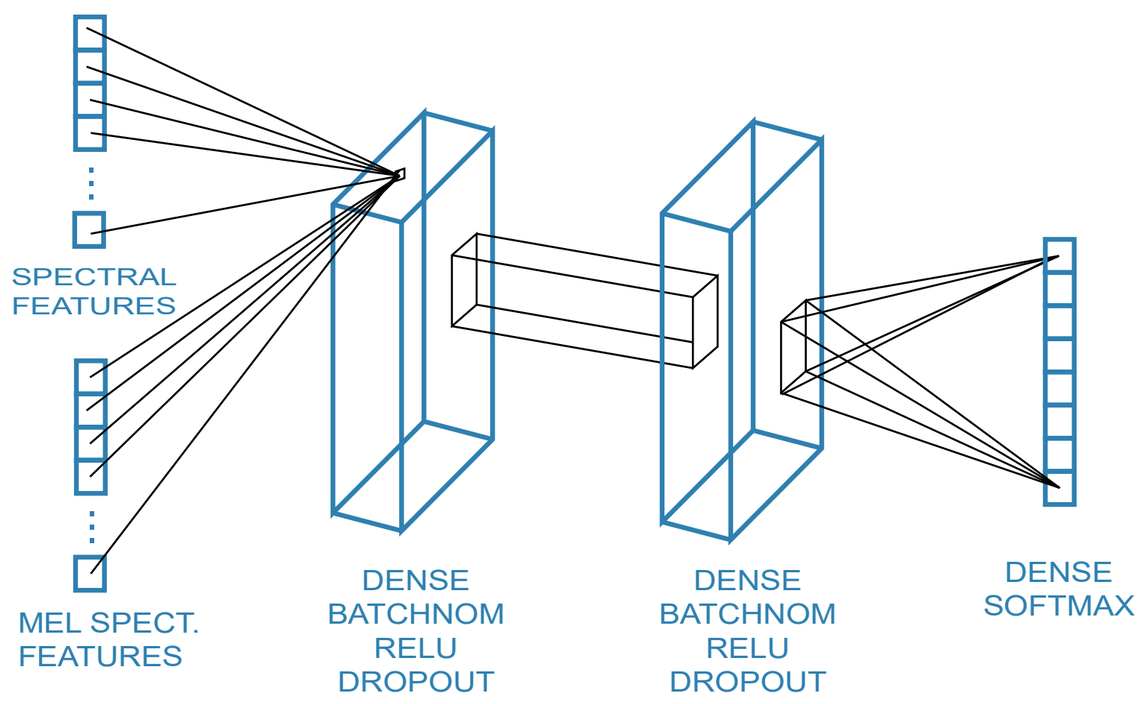
1. Short-time Fourier transform (STFT)
2. Mel Spectrogram
3. Mel Frequency Cepstral Coefficients (MFCCs)
4. Chromagrams
5. Echonest features
6. Combination of MFCCs and spectral features.



Features Model

Classifiers:

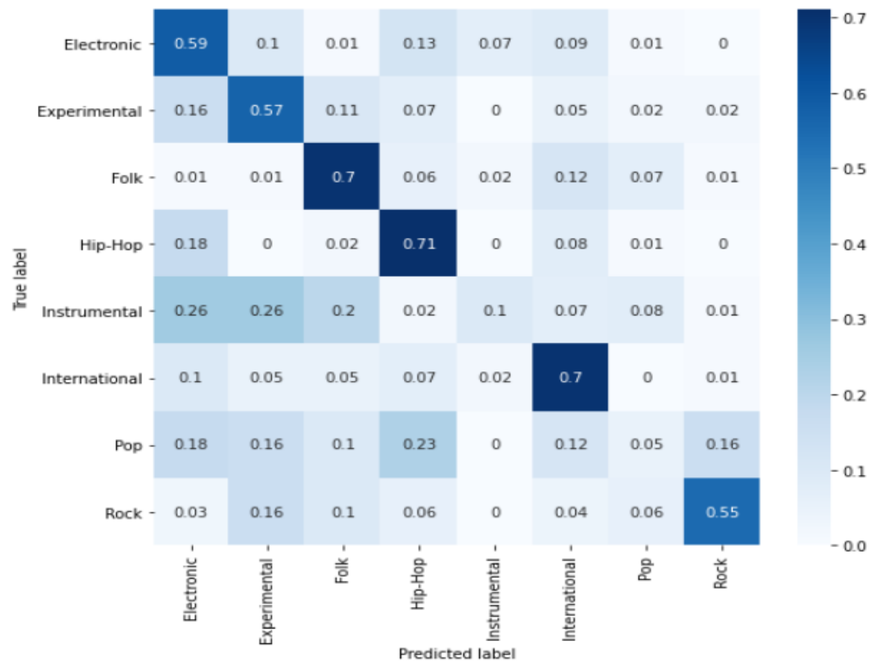
We developed a classifier for each feature set, evaluated the models, and determined that the multimodal classifier of Mel spectrograms and spectral features



Miltimodal Classifier Model

Discussion:

Based on the studied characteristics, it is shown that a multimodal classifier with MFCCs along with the Mel spectrograms, the spectral moments and the chroma STFT, show the best results for FMA data classification on its 8 genres, with 0,457% F1-macro and 0,496% F1-micro.



https://youtu.be/wIXYN4y_Tng

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