Project Proposal
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1 Introduction

Digital music has changed the face of music collection. Users can have megabyte or a gigabyte worth of music on their personal labtops and can easily download music from the internet. This has lead to the need to invent and test new tools in musical information retrieval. There are many websites and apps, Pandora, iTunes are a few examples, that can create playlist based on similarity to a certain song or genre of music. These sites need to be able to classify certain features of a song and build the playlist from there. This project is based on being able to classify the genre of a song. This may seem like a simple problem, since we can usually classify a song by ear, but that relies on the user having a vast knowledge of music. If we can automate the process using computers, we could find new and interesting insights that may not be obvious. However, this adds complexity that must be dealt with since we need techniques such that the computer can "listen" to the song and extract features so that the genre can be identified. To do this we take a song, which is a continuous signal and we sample at certain frequency to transform a signal into a discrete signal that is based on pitch which created by the sound pressures changes and define it as a function of time. From the discrete signal we can define "features" for each song that many be able to used to classify the genre.

For our project we are only classifying within six different genres, classical, electronically, jazz/blues, metal/punk, rock/pop and world. To compute similarities between each song it is imperative that we generate features. Given 729 training tracks, we will construct features for each song and the song that we would like to classify to create a different to be able to use k-means nearest neighbor method. Most features that we used were developed or used in Elias Pampalk dissertation [1]

We will now describe the features used to be able determine similarity.

2 Distance in song-space

Explain what are the available distance in the space of songs. Describe your distance and any pre-processing performed before computing the distance.

[1] Computational Models of Music Similarity and their Application in Music Information Retrieval by Elias Pampal

3 Dimension reduction

Describe your dimension reduction technique, and justify why it is appropriate to use it in this context. You should explain what performance is expected.

4 Statiscal learning

Explain how the training data help find the genre of an unknown song. This could be as simple as finding the closest song among all the songs for which you know the genre. Or it could involve more sophisticated methods.

5 Experiments

We have the following average cross validation matrix.

	classical	electronic	jazz	punk	rock	world
classical	63	1	2	0	1	10
electronics	0	16	0	0	1	3
jazz	0	0	1	0	0	0
punk	0	0	0	4	3	0
rock	0	5	2	5	15	5
world	1	1	0	0	1	6

6 Discussion

Provide a critique of the approach and discuss any potential improvement. Discuss the ability of your approach to classify non-classical into the five remaining genres.