

Multimedia Assignment 1

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Abstract—The whole aim of the whole assignment is to understand how a type of music genre compares with the other.

I. INTRODUCTION

A music genre is a conventional category that identifies some pieces of music as belonging to a shared tradition or set of conventions. The different music genres are Blues, Classical, Country, Disco, Hip-hop, Jazz, Metal, pop, Reggae, Rock.

II. PROBLEM STATEMENT

We try to understand the different music genres and find similarities between them. The second part of our problem is given a new music we need to accurately classify the new audio.

III. PROPOSED APPROACH

A. Feature Extraction

We have used various types of features in this assignment. Features like MFCC coefficients, energy, spectral flux, spectral centroid, ZCR have been used. We have divided the audio into 479 frames. We computed these feature values for every frame. In total for every audio we have computed 8621 features.

B. Classification

In the beginning, we are trying to identify various types of music genre. We have used SVM to learn a discriminant which helps us to classify the various types of music. SVM is trained on the whole feature set that we have computed. Our training phase consists of 900 audio samples from 10 genres of music. The classes that have been taken into consideration are Blues, Classical, Country, Disco, Hip-hop, Jazz, Metal, pop, Reggae, Rock. The test set consisted of 100 audio samples.

C. Similarity between genres

We apply KMeans and generated a similarity matrix and try to understand the relation between different types of music. We applied agglomerative clustering technique to understand how we can break the general class of music. So from this experiment we could conclude that music can be broken down into few general broad classes. They are Classical, Country, Metal and Pop.

D. Classification with the general classes

Once we have understood the similarity between music genres we reclassify them into a few general broad categories. We again train the SVM classifier on these classes. The number of datapoints in train and test set is kept as the original one. We see how the results vary from the previous experiment when we had taken all the classes of music.

IV. OBSERVATIONS

- In the first classification with 10 different classes we are only able to reach an accuracy of 29 percent.
- This result looks pretty poor but actually this result gives us deep insight regarding the nature of music.
- Different types of music are closely related. Many a times a person with good knowledge of music would also might not be able to classify or differentiate properly between different music genres.
- On further investigation we find that music can be broadly classified into Classical, Country, Metal, Pop. Most of the other genres are mixtures of these basic few genres.
- So we again divide the dataset but this time we only take the four basic genres that we have found. The classification results now show a significant improvement and reaches 62 percent.

S.no.	No of Classes	Accuracy
1	10	0.29
2	4	0.61

TABLE I

COMPARISON BETWEEN 10 CLASS CLASSIFICATION AND 4 CLASS CLASSIFICATION

V. DATASET USED

- GTZAN Genre Collection