Genre classification of Music files

Puneet Girdhar
Department of Computer Science
The University of Texas at Dallas
Richardson, TX 75080
Email: pxg151330@utdallas.edu

Dhruvkumar Patel
Department of Computer Science
The University of Texas at Dallas
Richardson, TX 75080
Email: drp150030@utdallas.edu

***Abstract*—Music classification is an interesting problem with many applications. Music streaming services like Spotify, Apple Music and Google Play offer music catalog categorized into different genres and moods. It isn't clear however whether this process of music categorization is automated or manual. This feature is also not very commonly available for offline music files. The reason is that music genres are hard to describe systematically due to their subjective nature. In this project, we have applied audio signal processing and machine learning techniques to classify music files in different genres. We received comparable results to recent work in music genre classification task.**

Keywords- Music Genre Classification, MIR, Music Information Retrieval

I. Introduction

For our project, we have used GTZAN genre collection dataset, which is available as part of Marsyas audio processing framework. G. Tzanetakis and P. Cook curated this dataset in their work [1] on music genre classification. Even though they did not intend for this dataset to be standard dataset for work on music genre classification task [3], its easy availability on web has made it the primary dataset used by many [2] [3] [4]. This dataset consists of 1000 audio tracks, each of 30 seconds duration. These tracks are spanned over ten different genres namely: Classical, Blues, Country, Hip Hop, Disco, Jazz, Metal, Popular, Reggae, and Rock.

We investigate various machine learning algorithms on GTZAN dataset in this project, including K-nearest neighbours(KNN), K-means, multiclass SVM, and neural networks. For feature extraction task, we have relied on timbre-based features, namely Mel Frequency Cepstral Coefficients(MFCCs). This has been recommended by previous work on this problem [5]. There are many other audio features that can be used like power spectrum of the signal, FFT of audio signal, but it has been found that MFCCs represent given music file's timbre attributes, which is the most important aspect for genre classification problem. We have verified this by getting comparable accuracy values on given dataset as original work [1].

II. Conclusion

The conclusion goes here.

Acknowledgment

The authors would like to thank...

References

[1] G. Tzanetakis and P. Cook, *Musical genre classification of audio signals*. IEEE Transactions on Audio and Speech Processing, 2002.

[2] Michael Haggblade, Yang Hong and Kenny Kao, *Music Genre Classification*. http://cs229.stanford.edu/proj2011/HaggbladeHongKao-MusicGenreClassification.pdf.

[3] Bob L. Sturm, *An Analysis of the GTZAN Music Genre Dataset*. MIRUM 2012.

[4] Ioannis Panagakis, Emmanouil Benetos, and Constantine Kotropoulos, *Music genre classification: a multilinear approach*. ISMIR 2008.

[5] Fu, A., Lu, G., Ting, K.M., Zhang, D. *A Survey of Audio-Based Music Classification and Annotation*. IEEE transactions on multimedia 2010.