

## **Song Genre Classification using Machine Learning Techniques**

Rishabh Iyer	-13D070008
Anand Pathak	-13D070019
Himanshu Pandotra	-13D070037
Pakshal Bohra	-130110008

### **1. Project description :**

Analyzing music audio files based on genres and other qualitative tags is an active field of research in machine learning. Today, people using online music services are very likely to search for music by genre, so understanding how to automatically classify music by genre is growing in importance.

Any approach to solve the following problem will involve two-stages

1. Feature Extraction
2. Using Classifiers

### **2. Studied Approaches -**

#### ***Studied Approach 1 :***

(<http://cs229.stanford.edu/proj2012/JordanCope-SongGenreClassification.pdf>)

For each song in the dataset extract the following features :

1. Mel-Frequency Cepstral Coefficients
2. Zero Crossings
3. Spectral Centroids
4. Chroma Properties
5. Spectral Rolloff

Use KNNs, SVMs, and other classifiers. Also use cross validation to test the results

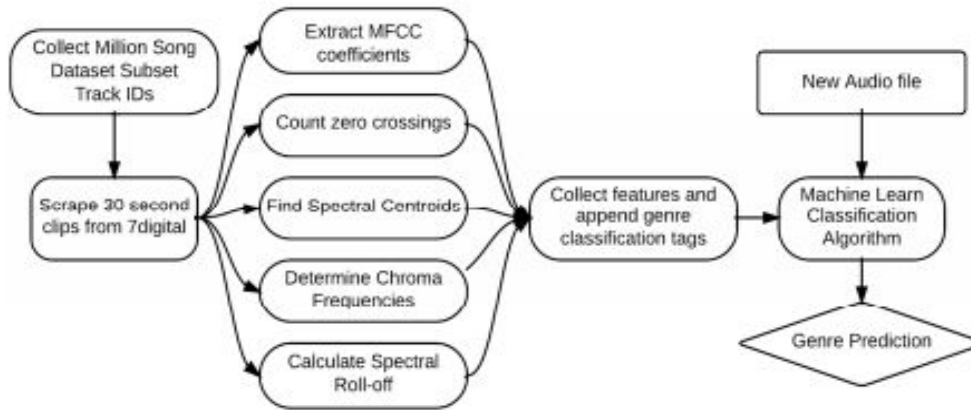


Figure 1. Proposed method of collecting data

### Studied Approach 2 :

(<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7001506&tag=1>)

Features extracted :

1. Beats periodicity
2. Loudness
3. Energy
4. Speechiness ( Quantitative measure of MFCC )
5. Valence (Quantitative measure of the power spectrum)
6. Acoustic-ness (differentiates natural sound from electric sound)
7. Measure of tempo & beat strength

This paper then uses neural networks to classify the songs according to genre

- Our approach will involve amalgamating and possibly extending existing approaches in literature

### 3. Other Relevant Research papers-

#### 1.Music Genre Classification using LBP textural features

- This paper converts an audio signal into spectrograms and extracts textural features from these time frequency images

[http://ac.els-cdn.com/S0165168412001478/1-s2.0-S0165168412001478-main.pdf?\\_tid=0e642cf8-840b-11e6-8ec9-0000aab0f6c&acdnt=1474909550\\_2938ec2a6ea95bb57e5c0c74d226db37](http://ac.els-cdn.com/S0165168412001478/1-s2.0-S0165168412001478-main.pdf?_tid=0e642cf8-840b-11e6-8ec9-0000aab0f6c&acdnt=1474909550_2938ec2a6ea95bb57e5c0c74d226db37)

#### 2.Tzanetakis, George, Georg Essl, and Perry Cook. "Automatic Musical Genre Classification Of Audio Signals." The International Society for Music Information Retrieval. 2001.

<http://ismir2001.ismir.net/pdf/tzanetakis.pdf>

#### **4. Data sets-**

We will be using the following data -sets. Naturally there will be a good amount of pre-processing and feature extraction done on these.

[http://marsyasweb.appspot.com/download/data\\_sets/](http://marsyasweb.appspot.com/download/data_sets/)

[https://musicbrainz.org/doc/MusicBrainz\\_Database/Download](https://musicbrainz.org/doc/MusicBrainz_Database/Download)

<http://labrosa.ee.columbia.edu/millionsong/lastfm>

Two of these databases, MusicBrainz and GTZAN, are curated; that is, humans assign their tags selectively with accuracy in mind for academic purpose. The other database, Last.fm, is crowdsourced: users apply tags with no moderator oversight. Thus, curated tag datasets are expected to be more accurate overall than crowdsources ones.