

PROJECT SUMMARY: MUSIC CLASSIFICATION BY GENRE*

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Abstract

A report containing theoretical background, methods employed, practical application results, and a breakdown of each member's role in the ELEC 301 Project: Music Classification by Genre.

Widespread access to the Internet popularized digital music. People download large collections of music files sorted into directory structures by artist or genre. For example, a student at Rice University may want to search a library of files stored on the computer of a student in Bremen, Germany for classical music. Language differences and foreign preferences for file naming would make it difficult for the Rice student to determine music genres. A collection of filters to classify music based on DSP analysis tools would allow users to search a collection of files and extract only those that have certain chosen characteristics.

We designed a classification system that analyzes the contents of a .wav music file in order to sort it into specific categories: classical, jazz, country, rap, punk, and techno. In order to classify music samples, we examine characteristics in both the time and frequency domains:

- bandwidth
- beat(tempo) variability
- high pass filtering
- number of FFT coefficients above threshold
- power spectral density
- smoothness in frequency domain
- total power

Then a neural network classifies each song based on its similarity to other songs in various genres. Previous classification projects have directly analyzed song clips in neural networks. However, we take a slightly different approach by providing the neural network with the previously listed DSP characteristics that represent the song. This method proves 84% accurate, having most difficulty classifying techno music.

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