Predicting Song Genre Using Machine Learning and Spotify API

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1 Introduction

The aim of this machine learning project is to develop a model that can predict the genre of a song using audio features obtained from the Spotify API. The project involves collecting audio features for a number of songs, including features related to rhythm, melody, and timbre. These features are then used to train our machine learning algorithm, which is capable of classifying songs into five different genres. The project also involves evaluating the performance of the model using an accuracy score. The results of the project have potential applications in music recommendation systems, music streaming services, and music analysis.

2 Previous Work

There are a few professional studies that have used machine learning to predict a song's genre based on audio features obtained from music platforms such as Spotify and Last.fm. One study by Yang et al. (2016) used a dataset of over 500,000 songs and extracted audio features using the Spotify API. The authors then used various machine learning algorithms, including logistic regression and neural networks, to predict the genre of the songs. They achieved an accuracy of over 70% using a logistic regression model. Another study by Lee et al. (2018) used a similar approach but also incorporated user listening history and demographic information to improve the accuracy of the model. Through the use of a deep learning model, they achieved an accuracy of over 80%. Another project by Kumar (2022) used the K-Nearest Neighbors classification algorithm to build a music genre classification program that has approximately 70% accuracy. The last project we surveyed was done by Ranganath (2023) and used the GTZAN Genre Classification dataset to train their data, which consists of 1,000 audio tracks of 10 genres. They used a variety of features to visualize the audio aspects of their dataset. For the actual machine learning algorithm, which achieved 92.93% accuracy, the authors chose to use the Convolutional Neural Networks method to train their model.

3 Methodology

3.1 Locations

In our Github, (`https://github.com/lamngo13/pineapple`), we have a file called 'forfun.py' which runs the Spotify API to get the set of songs and write them to a file called 'bigfile.json'. Our model is in 'maquinaprender.ipynb' which reads the content of 'bigfile.json'.

3.2 Intro

Data collection was the bulk of our work...

4 Conclusion

4.1 Results

Ultimately, we picked 50 songs from 5 genres: Metal, Salsa, Jazz, Country, and Reggaeton. Our model yielded an accuracy of .94! With this configuration of songs, we noticed that our model had great results for Metal and Jazz...

4.2 Limitations

Our largest limitation is the relatively small sample size of this work...

4.3 Future Work / Impact

Our work is important because...

References

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