Music Genre Classifier

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***Abstract*—Music, as a universal language, is an integral part of human culture, with a diverse range of genres catering to various tastes and emotions.Music genre classification, the task of automatically assigning a genre label to a piece of music based on its audio content, plays a crucial role in achieving this organization. With the help of the classifiers such as K-NN and SVM can capture the intricate details of the audio or the song uploaded. The GTZAN dataset, a widely used benchmark dataset in the field of music genre classification, provides a rich resource for training and evaluating classification models.**

***Index Terms*—K-NN, SVM, GTZAN dataset**

I. Introduction

Music, as an art form, is deeply ingrained in human culture and society, serving as a means of expression, entertainment, and communication across diverse communities. With the advent of digital technologies and the proliferation of online music platforms, the sheer volume and variety of music available to listeners have expanded exponentially. However, this abundance of music also present challenges in terms of organizing, navigating, and discovering music that aligns with individual preferences.

The GTZAN dataset, a widely used benchmark dataset in the field of music genre classification, provides a rich resource for training and evaluating classification models. Comprising audio clips spanning ten distinct genres, including rock, jazz, blues, and electronic, the GTZAN dataset offers a diverse and representative sample of musical styles, making it an ideal testbed for exploring different classification techniques.

Exploration of music genre classification using the GTZAN dataset, with a particular focus on the application of KNN and SVM classifiers. Our objective is to assess the performance of these classifiers in accurately categorizing music genres based on extracted audio features. By examining the efficacy of various feature representations and evaluating classification performance metrics, we seek to elucidate the strengths and limitations of KNN and SVM classifiers in the context of music genre classification.

Music genre classification addresses these challenges by categorizing songs into distinct genres based on their stylistic and sonic characteristics. By automatically assigning genre labels to music tracks, genre classification algorithms facilitate music recommendation, playlist generation, and personalized content delivery. Moreover, they enable users to explore and discover new music within their preferred genres or across different musical styles.

II. Literature Survey

[10]Explores the effectiveness of machine learning algorithms, specifically k-nearest neighbor (k-NN) and Support Vector Machine (SVM), in predicting music genres1. The authors use Mel Frequency Cepstral Coefficients (MFCC) to extract features from the GTZAN dataset, which contains 1000 songs across 10 genres, and compare the performance of these algorithms with and without dimensionality reduction via principal component analysis (PCA). The study concludes that SVM outperforms k-NN in music genre classification, achieving an overall accuracy of 77% without dimensionality reduction, and suggests potential future work in exploring other genres, features, and classifiers.

[9]This paper discusses a music genre classification model built using Python. The model processes audio data and predicts its genre using the K-Nearest Neighbor method. Each song is divided into small sections, and 13 features are extracted from each section using the Mel Frequency Cepstral Coefficient (MFCC) method. The mean and covariance of these features represent the song. The authors use K-Fold Cross Validation to find the optimal value of K for the KNN model, with K=5 yielding the highest prediction accuracy of over 72%. The prediction accuracy varies across genres, with classical being the easiest to predict and rock being the hardest. The authors also identify feature 0 and 1 as key features to distinguish genres.

[8]The document discusses the application of machine learning algorithms for music genre classification using Mel-frequency cepstral coefficients (MFCCs) extracted from a dataset of 1000 songs across 10 genres. It compares the performance of four algorithms: Naive Bayes, k-means, k-medoids, and k-nearest neighbor, considering different distance metrics, data conditioning, and number of clusters or neighbors. The document reports the accuracy of each algorithm on different subsets of genres and suggests potential improvements and extensions for future work.

III. METHODOLOGY

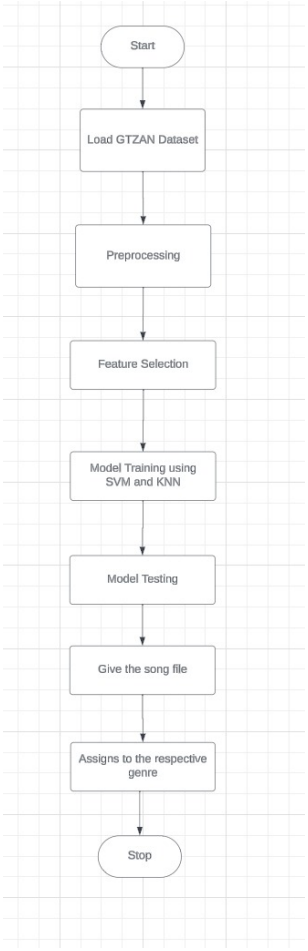

Fig. 1. Flow Chart

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