

MUSIC GENRE CLASSIFICATION USING CNN

A Machine Learning and CNN-Based Approach for
Personalized Music Classification

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Date: April, 2025





PROJECT OVERVIEW

- An intelligent system that recommends music genres using a CNN model, which classifies genres by analyzing audio features and spectrograms through natural language processing techniques.

Key Technologies Used:

- Machine Learning (ML) for music genre classification
- Convolutional Neural Networks (CNN) for audio feature and spectrogram analysis

PROBLEM STATEMENT

Why is this needed?

- People have a hard time choosing music because there are so many genres.
- Current methods don't always classify music genres correctly.
- We need an automatic system that uses CNNs to better identify music genres.
- This will help organize music and give more accurate genre suggestions.



PROJECT OBJECTIVES



Music Genre Detection and Analysis

Accurately classify different music genres using a CNN model that analyzes audio features and spectrograms.

Personalized Music Recommendations

Recommend appropriate music and movies based on the emotion detected.

Improved User Engagement and Satisfaction

Aim to boost user satisfaction by providing more accurate and tailored genre-based recommendations, ensuring a better music discovery experience.

DATA COLLECTION

Music Genre Dataset

Sources: Publicly available music datasets like GTZAN or others.

Data: Labeled audio files and spectrograms with music genres (rock, jazz, classical, etc.).



MUSIC GENRE CLASSIFICATION WORKFLOW



Audio Input

The system takes an audio file as input, which could be any music track.

Data Preprocessing

The audio file is converted into a spectrogram, a visual representation of sound, to capture patterns and features that represent different genres.

Genre Classification Using CNN

The spectrogram is fed into a Convolutional Neural Network (CNN), which processes the data and identifies patterns unique to each music genre.

Genre Prediction

The trained CNN model predicts the genre of the input music, such as rock, classical, jazz, or others, based on the analyzed patterns.

CORE TECHNOLOGIES AND FRAMEWORKS



> CNN (Convolutional Neural Network)

A deep learning model that is used to analyze the spectrograms of music tracks and identify patterns for accurate genre classification.

> Flask

Used to build the backend server for real-time emotion detection and recommendation handling.

> TensorFlow/Keras

Deep learning frameworks used for building and training the CNN model.

> HTML & CSS

For creating a user-friendly interface to display music and movie recommendations.



PREPARED MODEL

- **Convolutional Neural Network (CNN)**

The prepared model is built using CNN to classify music genres by analyzing spectrograms of audio files.

- **Dataset and Preprocessing**

The model was trained on a labeled dataset, where audio files were converted into spectrograms to capture sound features.

- **Training and Pattern Learning**

The CNN was trained to recognize patterns in the spectrograms, allowing it to differentiate between various music genres.

- **Genre Prediction**

The model can predict the genre of an input audio file based on the learned patterns in the spectrograms.



PROPOSED MODEL

● Model Improvement

Plan to improve accuracy by using a larger dataset, advanced preprocessing techniques, and optimizing the CNN architecture.



● Flask Integration for Web Deployment

Integrate the model into a Flask-based web application where users can upload audio files for real-time genre classification.



● Frontend Development

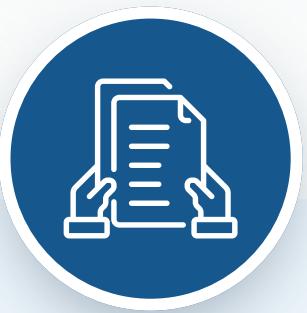
Build a simple, user-friendly interface using HTML and CSS for seamless user interaction with the system.



● Real-Time Genre Prediction

Enhance the system to provide real-time music genre predictions with visual feedback for better user experience.

Conclusion and Q&A



Working

Our project effectively uses audio spectrogram analysis through Convolutional Neural Networks (CNN) to provide accurate music genre classification.



Result

Our project connects music and technology, providing users with accurate music genre classification based on audio features.



Q&A Session

Any Questions?!



TEAM DETAILS

B CHAITANYA

TEAM LEAD

Worked in model
preparing and
training

AMAR BALAJI

worked in
frontend part
of this project

PRAKASH

model testing
and connecting
to flask

SAI RAM

Data collection
which is required
for the model

VENKAT SAI

Preparation of
Documentation and
Presentation

BIG THANKS!!!

