

Music Recommendation System Based on Genre Recognition

Introduction

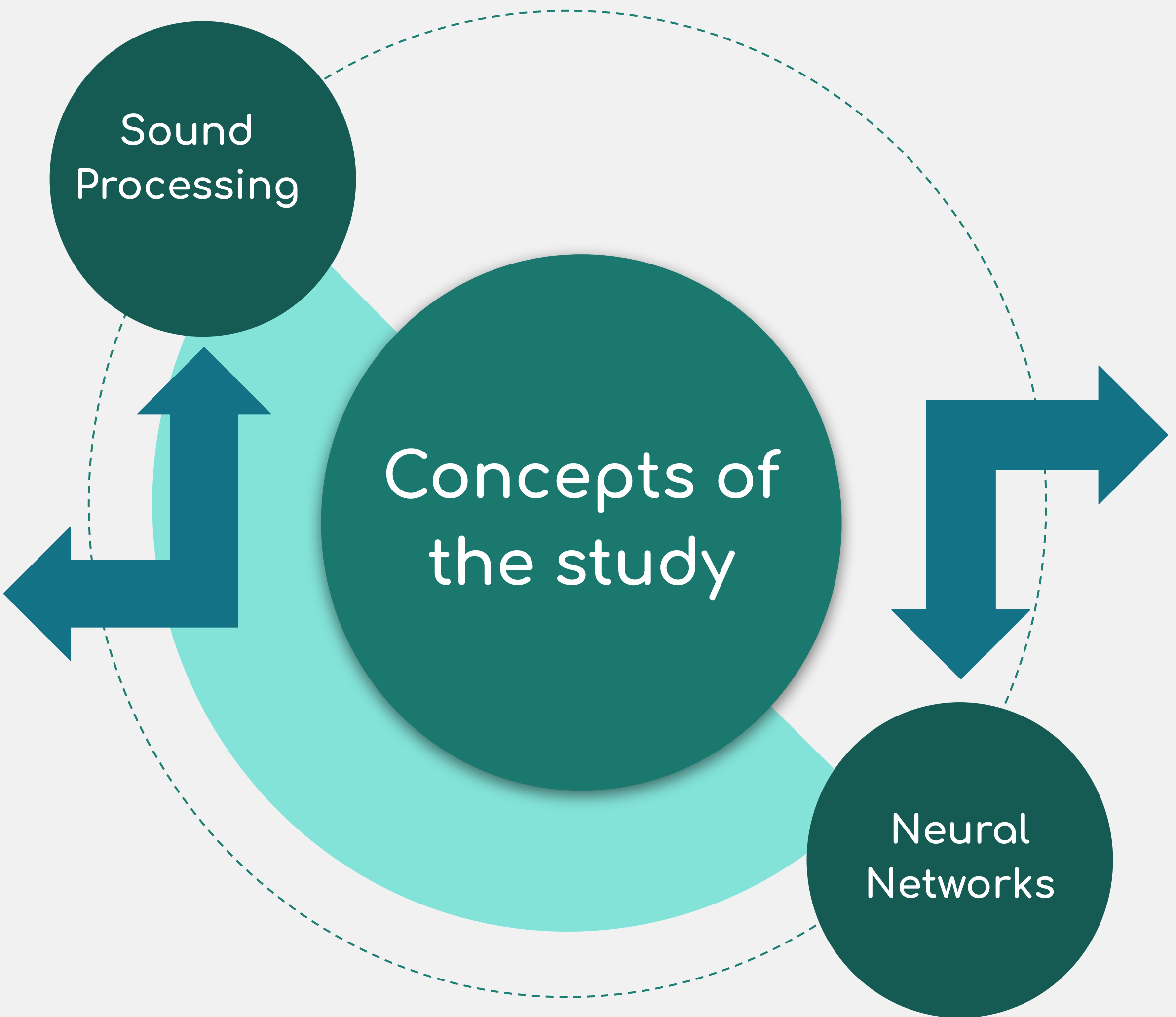
This project is an extension of the Music Genre Recognition Project developed by Albert Jimenez, which consists of using a pre-trained music genre classification system to add the capability of recommending new songs to the user based on their favorite music genre, i.e. the genre that has the most of previous predictions during the use of the system.

1	Takes audio files as input.
2	Extracts the spectrogram of music frames.
3	Analyzes the image using a Convolutional Neural Network (CNN) plus a Recurrent Neural Network (RNN).

In order to analyze the signal, the system needs to apply some sound processing techniques. Generating the spectrum of the given signal and creating an image that will work as the input for the neural network. This spectrograms will be divided in frames and then they will be evaluated to classify the signals by genres, and furthermore analyze these results to suggest other songs that the user could like based on previous predictions..

Datasets used for training:

- Million Song Dataset
- GTZAN



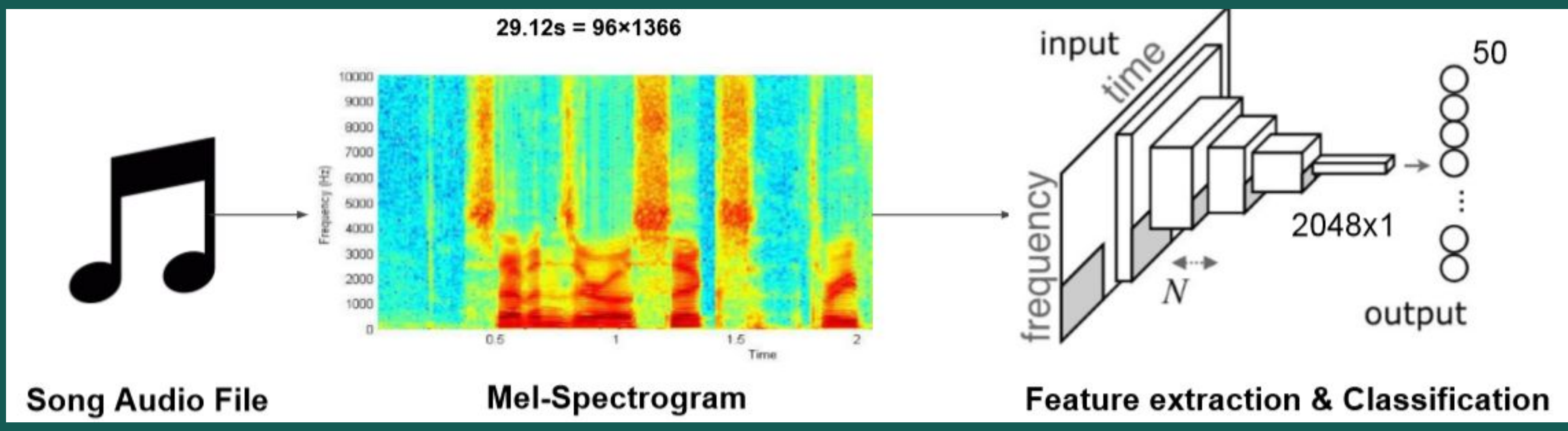
CNNs are especially useful for classification and recognition. They are composed by two main parts: a feature extraction part and a classification part.

The program uses a CNN because the sound waves are pre-processed in a way that helps the network get the frequency distribution as a spectrum that can be treated as an image. And so the CNN can analyze its patterns, apply filters and classificate the song.

Results

The first part of the system analyzes the user's music and predicts which genre each song belongs to, with an accuracy of 78%. It plots a graph with the probability of each genre.

After recognizing the genres for each song, the system determines the user's favorite genre based on the predictions and it recommends songs from a different folder.



Discussion

In the results we can see that, with artificial intelligence, computers can recognize music genres successfully. Through the time the models of genre recognition could be improved getting better results.

Then, the music genre recognition can be used to develop different apps and systems like a music recommendation systems (like this we are showing), also with programs that recognize songs the genre recognition can be a plus and other uses.

Conclusion

Nowadays, AI is helping to make the life easier. This project is based in that thought.

Using Sound Processing techniques to process the songs, Neural Networks for classify and recognize the song, also using tools like activation functions, convolution and others, this project can learn which genre is your favorite and give you options of different songs in that musical genre.

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The predicted music genre for song #1 (nirvana.mp3) = Rock
The predicted music genre for song #2 (isthislove.mp3) = Reggae
The predicted music genre for song #3 (gangnam.mp3) = Pop
The predicted music genre for song #4 (september.mp3) = Disco
The predicted music genre for song #5 (chained.mp3) = Pop
The predicted music genre for song #6 (foreveryoung.mp3) = Pop

Based on previous music recognitions, your favorite genre is: Pop
With 3 previous predictions.

I think you could like these songs. Give them a shot!
* badromance.mp3
* notearsleft.mp3
* onekiss.mp3
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