HERTZ

A complete musical app

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Problem Statement

For various tasks (music player, genre detector, song detector and tabs for songs, lyrics for a song) , a user needs to switch applications thus consuming time and space. Apart from the generic use of classification(Genre), it can be further used to better understand audio properties and human perception of music. Moreover, its applications can be extended to develop various systems like music genre-based disco lights and emotion-mapped music.

Objective

- To develop an application (IOS/Android) that can classify songs based on genre.

Proposed Solution

- By developing flutter application using Neural Networks to classify the genre of the song , for which various python modules will be used in backend to train and classify the songs using Mel frequency Cepstral Coefficient(MLCC) , Spectral Centroid , Chroma

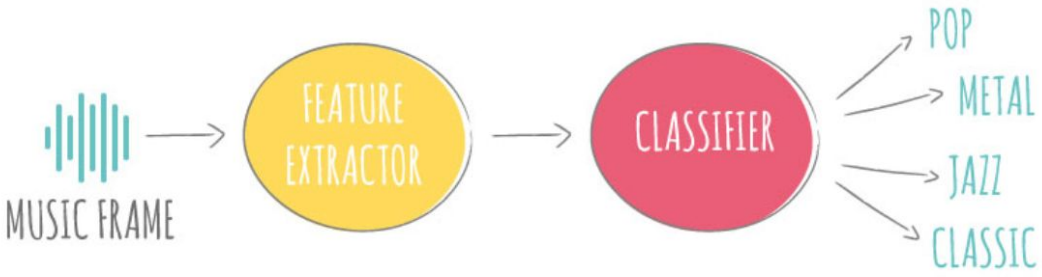
or Spectral contrast. These values will be directly fed to the Neural Net.

- We may also use chroma-based features as they are closely correlated to harmonic and melodic aspects of music, while being robust to changes in timbre and instrumentation.
- Performance of these chroma-based audio features or pitch class profiles can be compared with the performance of other features like MFCC, zero-crossing, rhythm based features, etc to establish classification efficiency associated with each.

*NOTE- MLCC mimics human hearing and are widely used in speech recognition applications.

*All Classification Features are proposed and may or may not be included in the final application.

Block Diagram/Figure



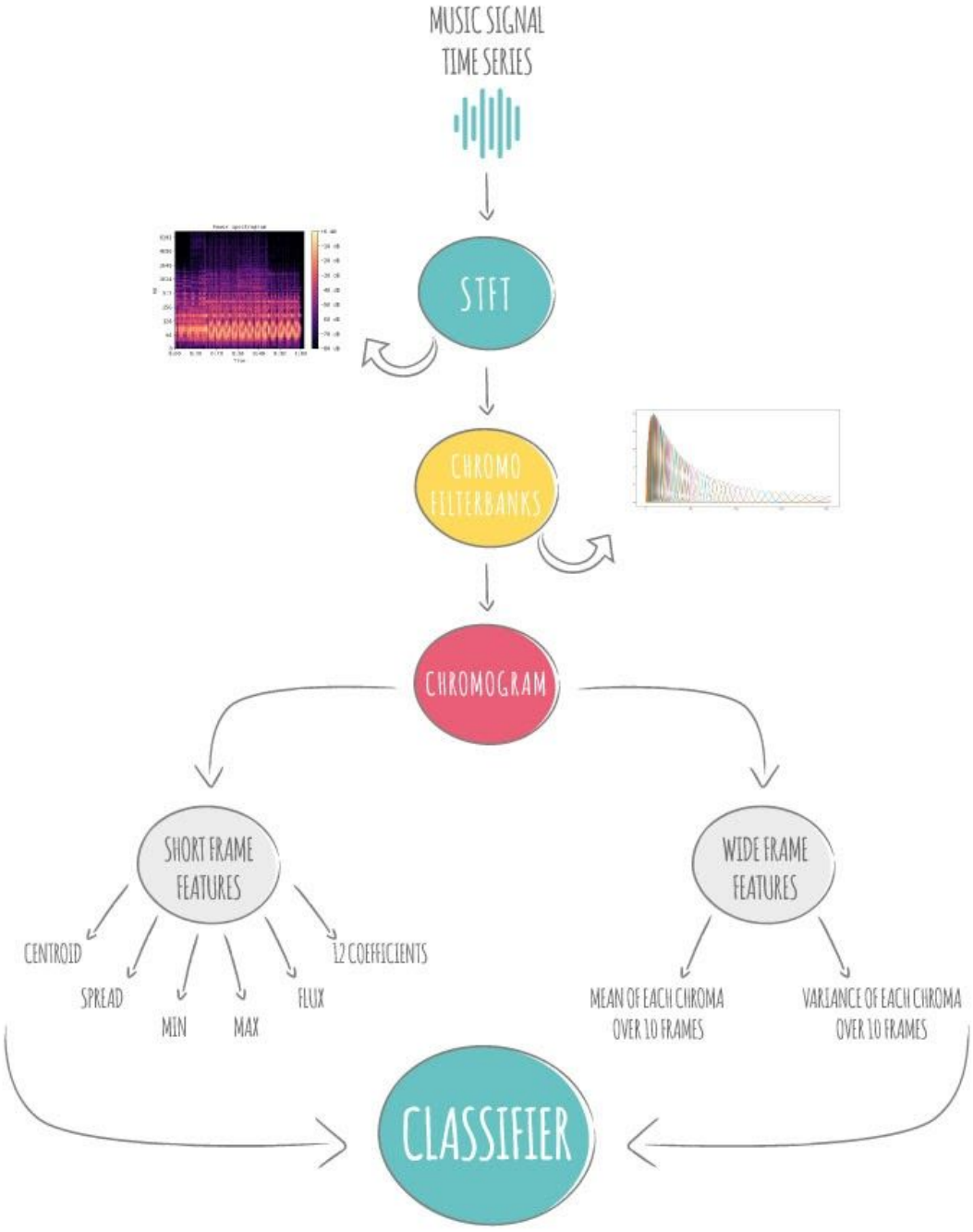
Application

➔ Can be used as a general purpose Music player.

➔ Can segregate songs on the basis of their genre to increase user's music listening experience as already made playlists on there genres.

➔ Developing an automatic genre based disco lights system.
➔ Automatic Equaliser.
➔ Emotion-mapped music player

Flowchart



*Short Time Fourier Transform (STFT)

Software Requirements

- Python libraries
    1. Numpy
    2. Matplotlib
    3. Keras (For Neural network)
    4. Globbecause
    5. Librosa
    6. Pytorch
- Android studio
- Flutter SDK
- Emulator for testing
- Flutter

Languages

- Python
- Dart

App Environment

- Android
- Apple

Dataset

- GTZAN dataset