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.

Proposed Solution Approach

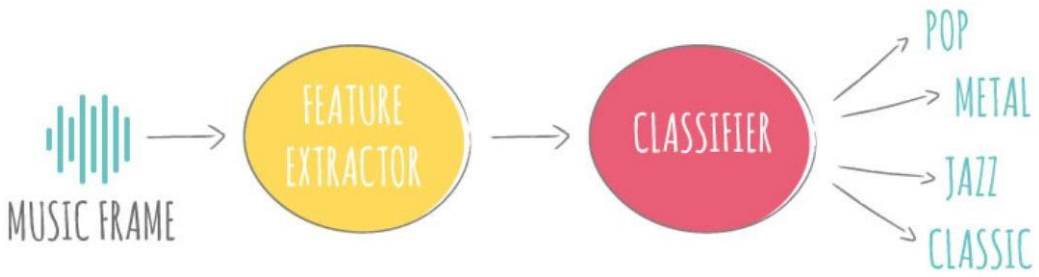
- By developing flutter application using Neural Networks to classify the genre of the song , for which various python modules will be used in backend to train and classify the songs using Mel frequency Cepstral Coefficient(MLCC) , Spectral Centroid , Chroma or Spectral contrast. These values will be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

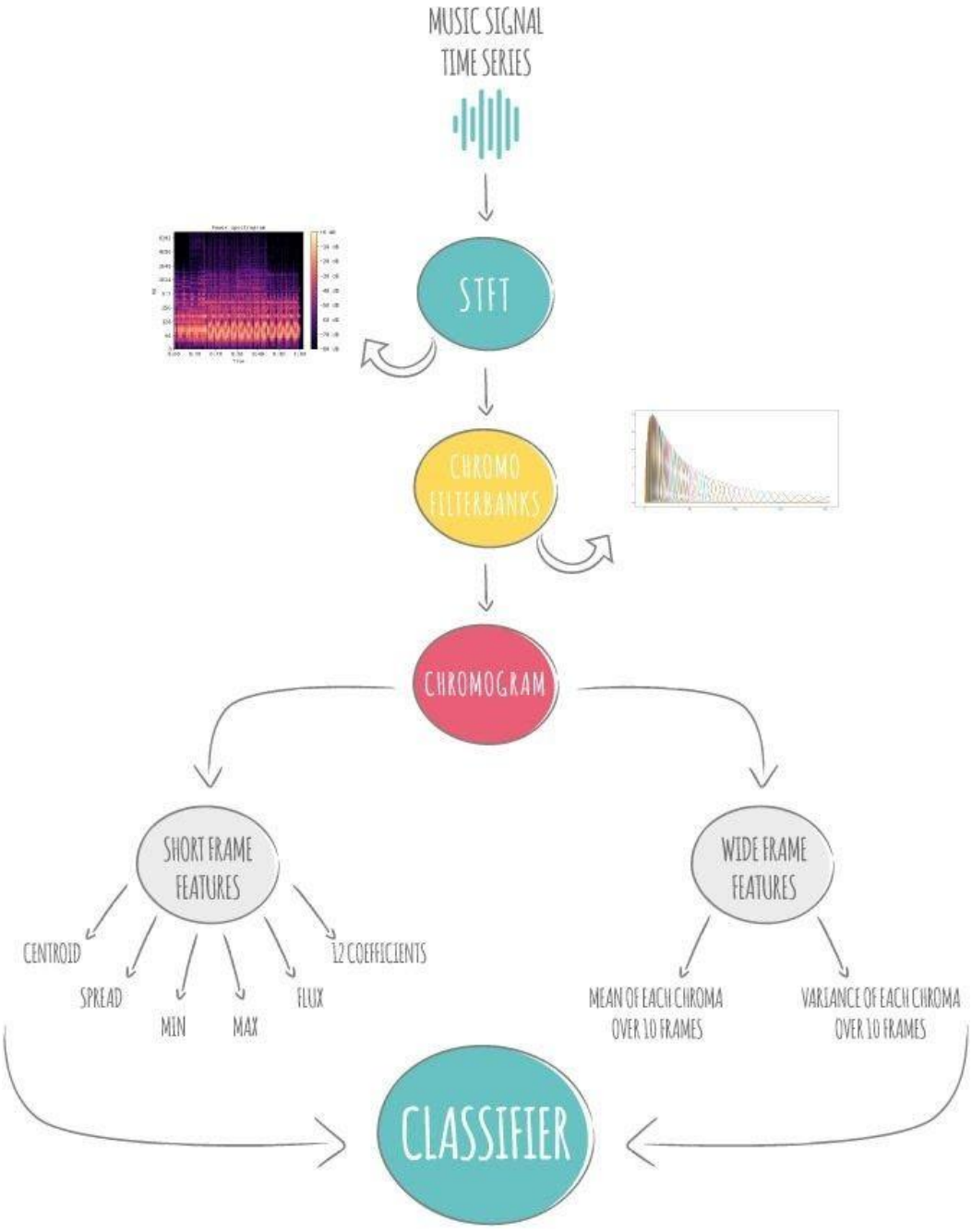
Block Diagram/Figure



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
- Web Development

Languages

- Python
- Dart
- HTML
- JavaScript
- CSS

App Environment

- Android
- Apple

Dataset

- GTZAN dataset

Front-End

- The front end of the project is made using flutter and the website is made using HTML, JavaScript and CSS.

- Flutter is an UI software development kit. It is used to develop applications For Android, iOS, Linux, Mac, Windows, Google Fuchsia, and the web from a single codebase.

- We have connected this flutter frontend with the website that is made using HTML,CSS and JavaScript using flutter_inappbrowser.

- We have used (AJAX Asynchronous JavaScript And XML),with Ajax, web applications can send and retrieve data from a server asynchronously without interfering with the display and behavior of the existing page.