PRESENTATION

MUSIC GENRE IDENTIFICATION

GetYourMusicStyle

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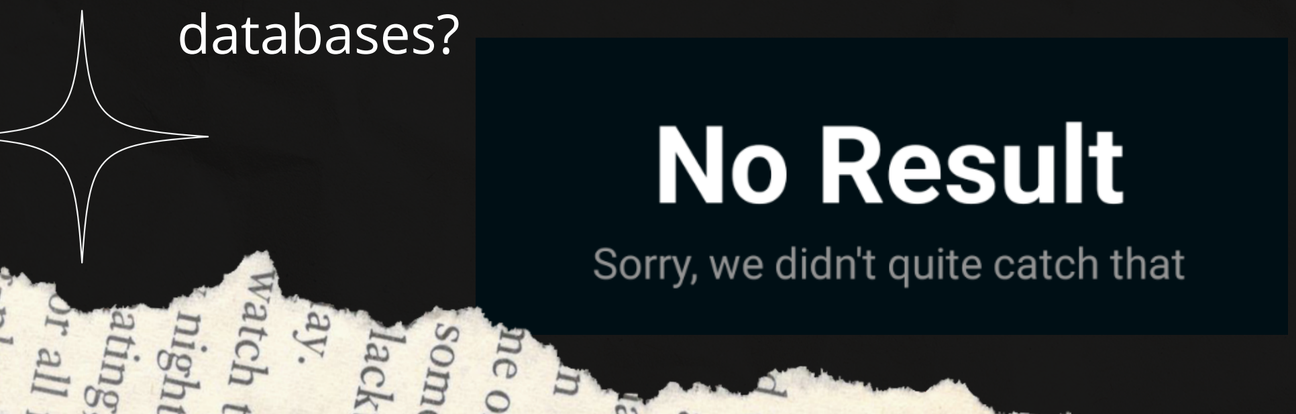
BUSINESS UNDERSTANDING

IDENTIFY A GENRE AND MAKE RECOMMENDATIONS?

- Apps like Shazam can identify a music piece if they can find it.
- Apps like Spotify would recommend music based on a genre/channel that user likes.
- But what if it's a live performance or independent label recording that is not in Shazam/Spotify databases?



PROJECT GOALS:

- A model that determines a genre of a given music piece.
- A tool that would recommend music based on an identified genre.

The tool will display visualizations and/or appropriate cover art that is suitable for the identified genre

IMPLEMENTATION PLAN

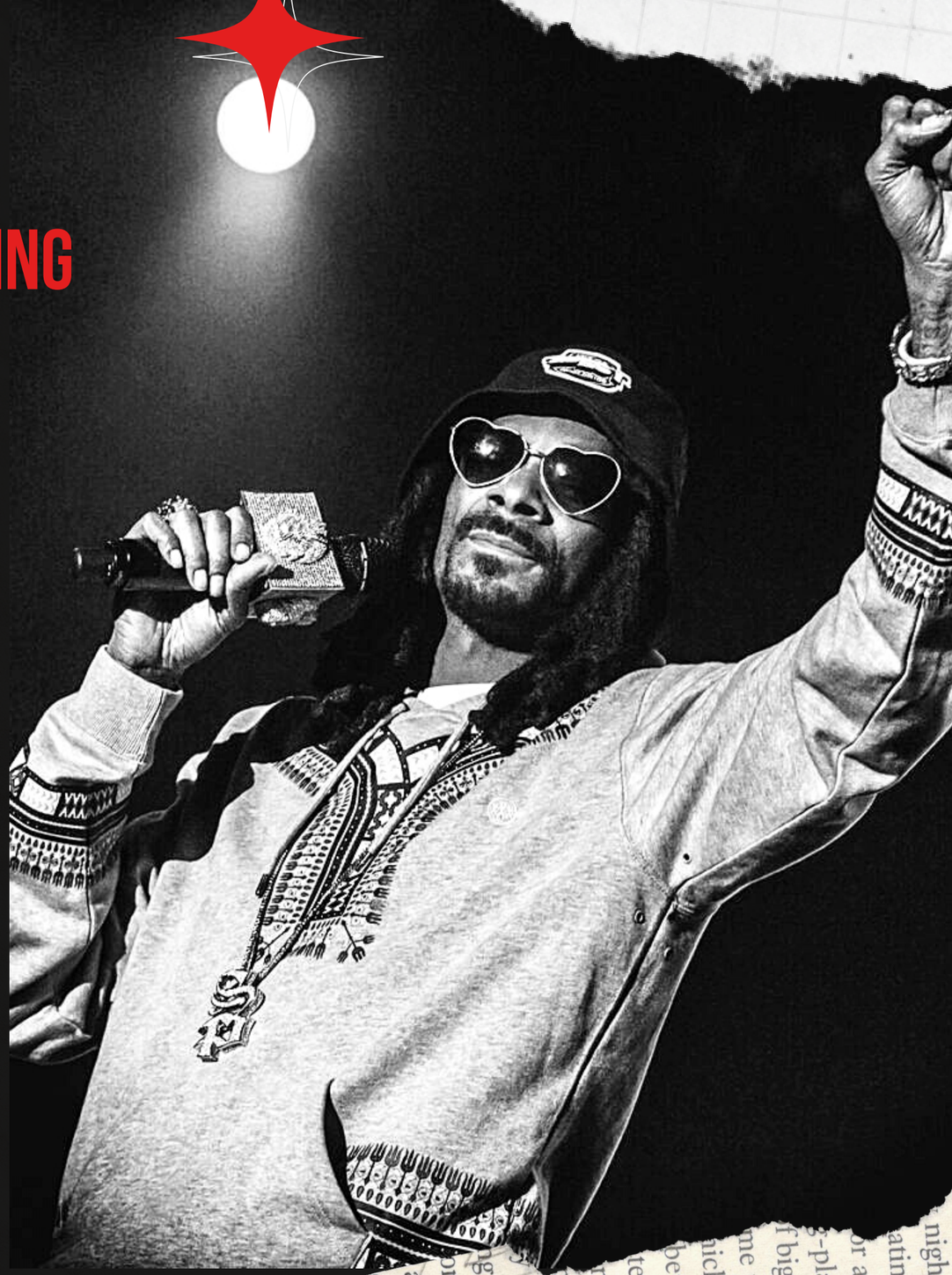
- Chosing and prepairing music dataset
- Modeling
- Setting up a recommendation db system
- Creating a Music Classifying and Recommendation Tool

DATASET REQUIREMENTS
FOR SUPERVISED LEARNING

- Music datafiles labeled with proper genres
- Truly representative selections in order to avoid "noise"

DATASET CHOICE

- We used and labeled our own collection of recordings as well as recordings publicly available on YouTube.



DATA UNDERSTANDING

- 4,700 wav samples 30 seconds each based on 2000+ recordings
- 14 genres:

Classical	Blues	Hip Hop
Rock	Soft Rock	Folk
Jazz	Jazz Piano	Swing
Soul	R&B	Pop
Electronic	Electronic Chill	

MODELS

1. Artificial Neural Network (NN)
2. XGBooster
3. Convolutional Neural Network (CNN)

MODELS PREPARATION

- Load a wav file as a time series.

NN, XGBOOST

- Using various time series transformations extract useful features and store them in a CSV file together with the genre labels.
- Train various models using saved csv metadata.

CNN

- Use time series to generate a spectrogram image visualizing the signal strengthl over time at various frequencies
- Train a model directly using images/spectrograms

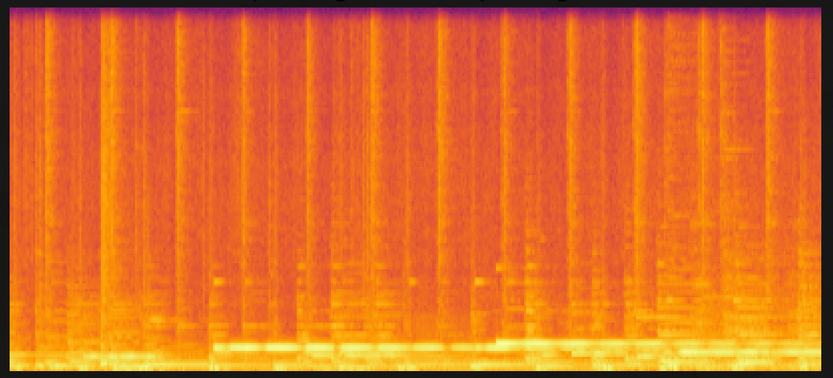
PRE-PROCESSING

NUMERIC FEATURE EXTRACTION:

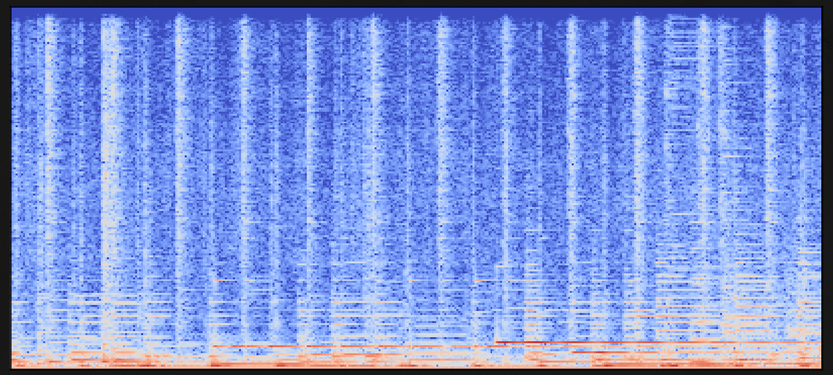
- MFCC
- Spectral: contrast, bandwidth
- RMSE, Chroma Shift
- Zero Crossing Rate

SPECTROGRAMS:

Matplotlib generated spectrogram:



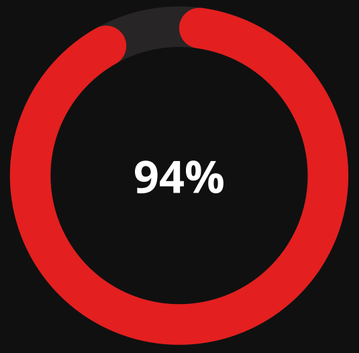
Librosa generated spectrogram:



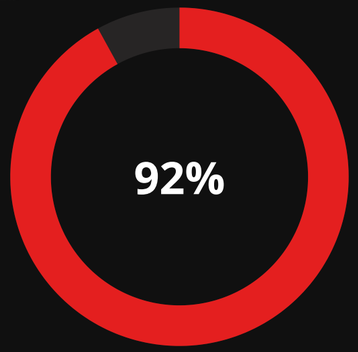
MODELS EVALUATION

- XGBoost and Neural Network were combined to provide more accurate classification
- CNN will be added in future releases after additional tuning

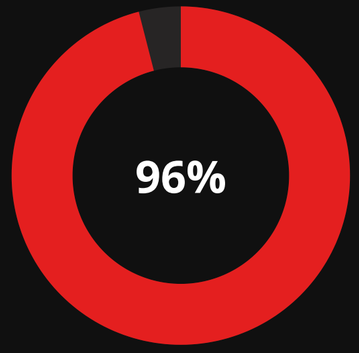
ACCURACY:



CNN



XGBooster



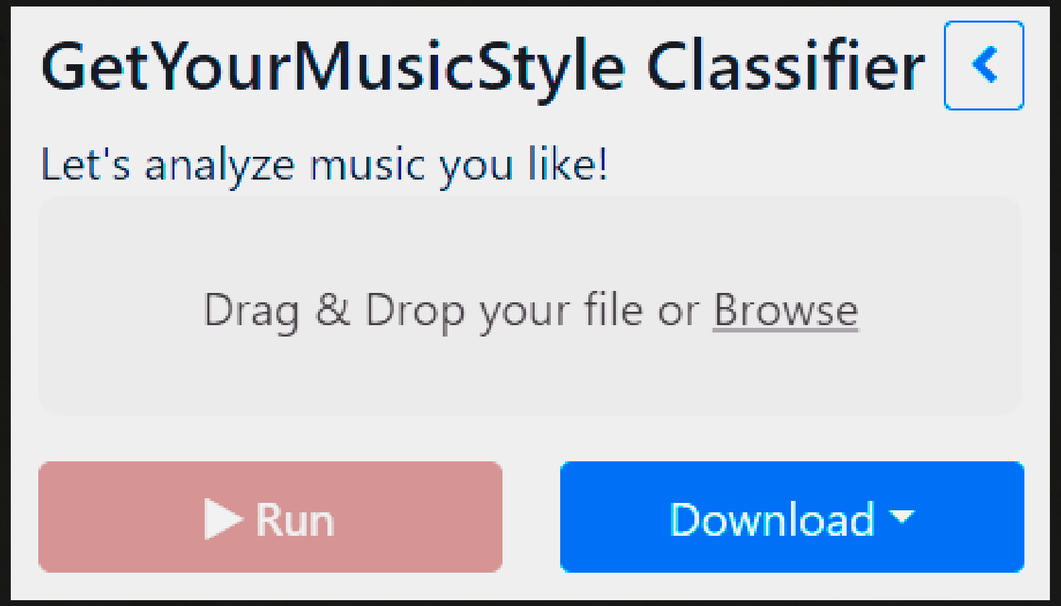
Neural Network

RECOMMENDATION SYSTEM

- A sample database of songs created
- Proper genre labels added
- Features are extracted and added
- Top songs with the same genre and alike features are recommended

CLASSIFICATION TOOL

- First (current) version of a tool uses Mercury workframe and can analyze any mp3 file
- Further versions can include recording a song using Mic in a similar way as Shazam or SoundHound do



USE CASES

SCENARIOS AND BENEFITS

- You are at a live performance and would like to find music of the same genre?
- Your friend just recorded a cool demo and you want to find similar bands?
- You are trying to identify a recording they play in a coffee shop, but Shazam cannot find it. You are interested in discovering sound-alike music?

NEXT STEPS

FURTHER RELEASES

- Add more Genres and Selections and further improve tool accuracy
- Add capability to capture music using build-in microphone
- Create more flexible and faster tool interface

ANY QUESTIONS?

THANK YOU!

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