Music Genre Classification

Machine learning module

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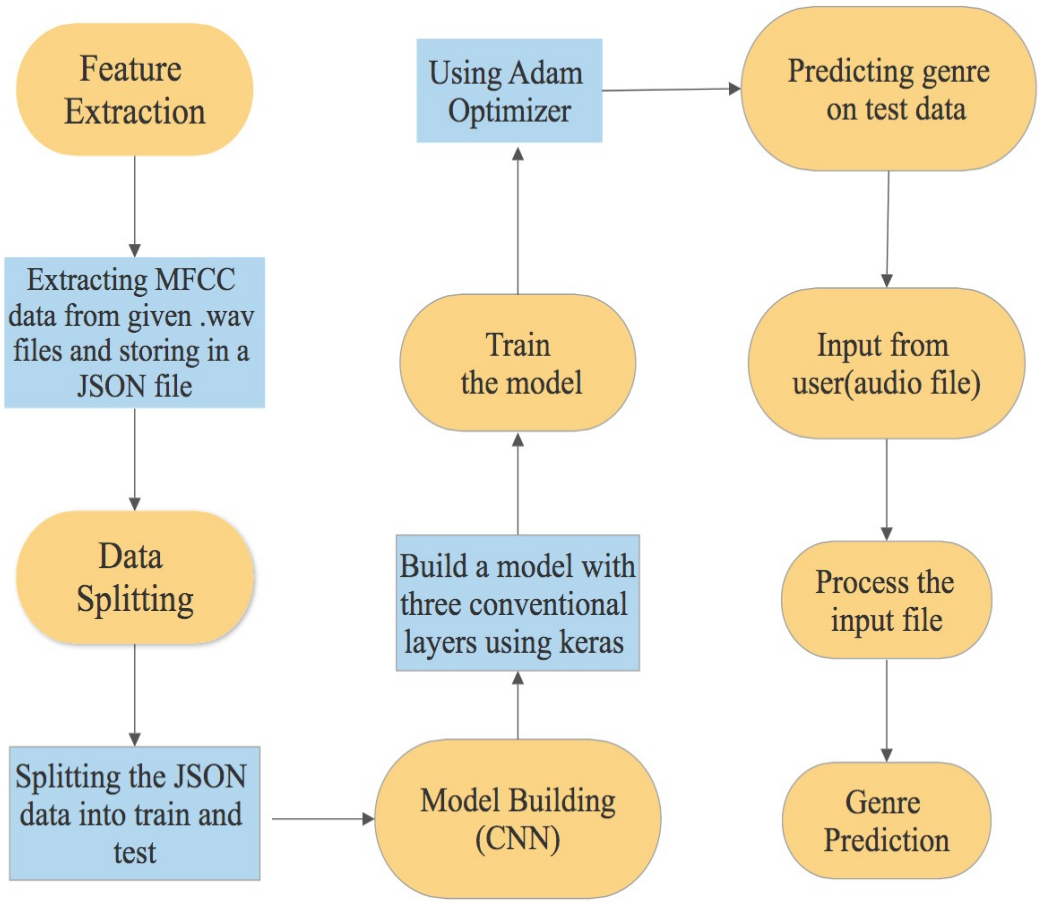
Problem Statement

Create a CNN model which classifies music samples into different genres and predict the genre of an input audio file

Dataset

- **.wav files per genre:** 100
- **Number of Genres:** 10
- **Genres:** Blues, Classical, Country, Disco, Hiphop, Jazz, Metal, Pop, Reggae, Rock

Approach


Feature Extraction
Extracting MFCC data from given .wav files and storing in a JSON file
Data Splitting
Splitting the JSON data into train and test
Model Building (CNN)
Build a model with three conventional layers using keras
Train the model
Using Adam Optimizer
Predicting genre on test data
Input from user(audio file)
Process the input file
Genre Prediction

Technical Stack

Libraries:

- Librosa
- Pandas
- Numpy
- Keras
- Json
- Sklearn
- OS
- Flask

Tools:

- Google Colab
- Latex

Learnings

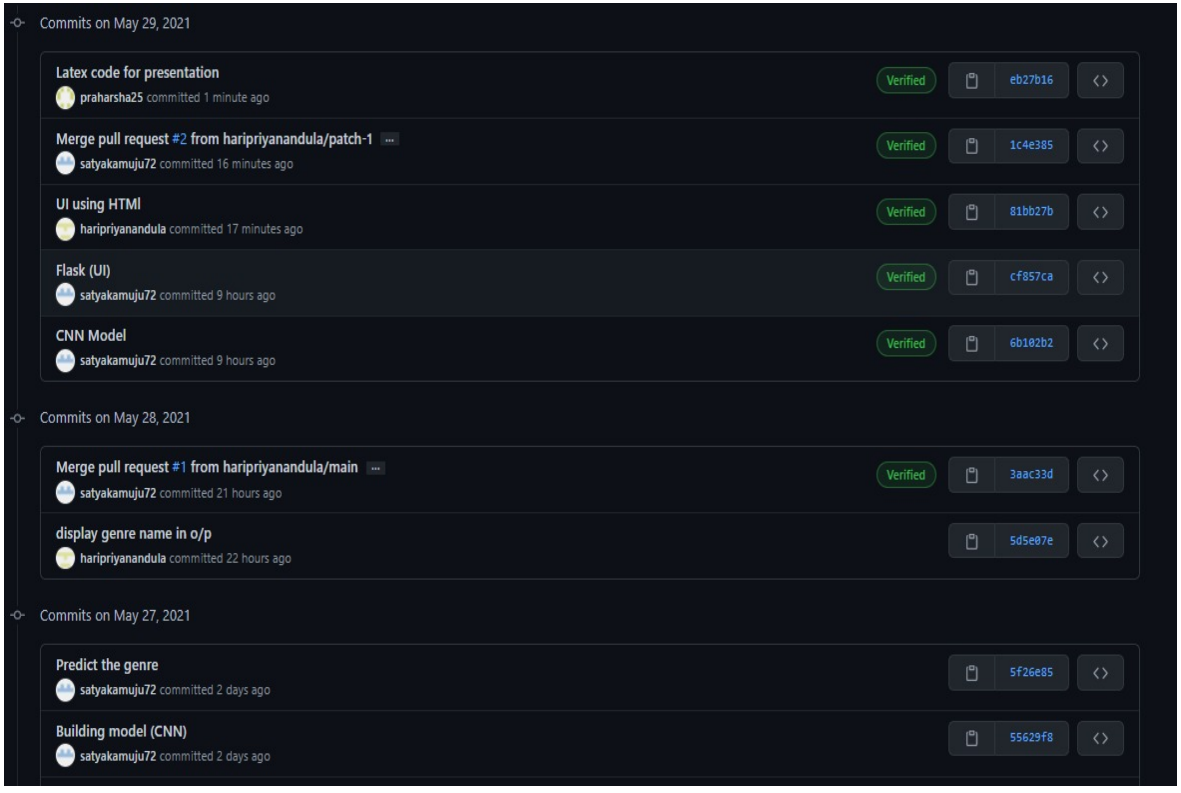
- Understanding Librosa library
- Storing data into a JSON file
- Building a CNN Model

Challenges

- Extracting Features
- Connecting UI to a python notebook
- Adding images to GUI

Git Repo

Git Repo link: `https://github.com/satyakamuju72/Music_Genre_Classification`

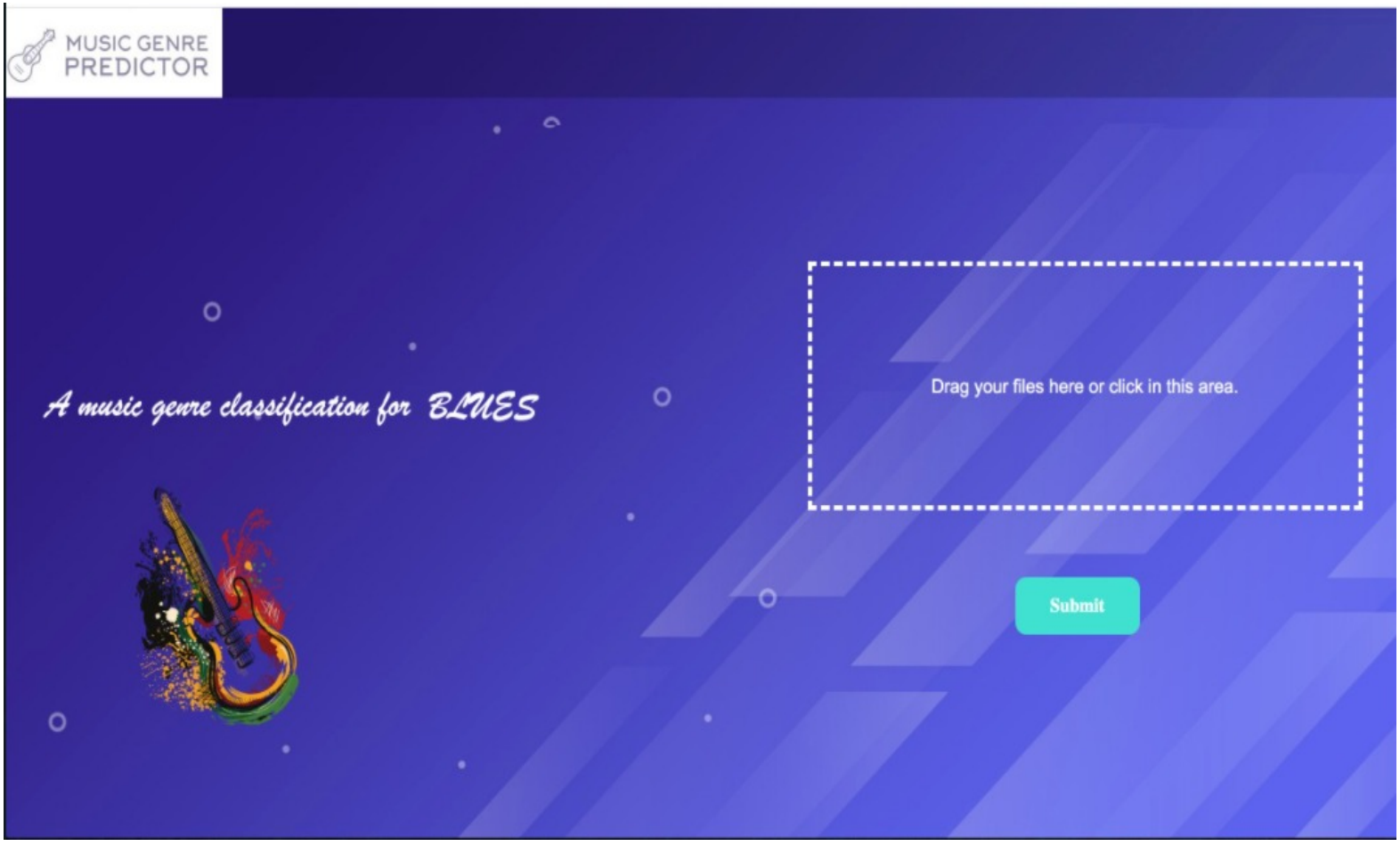


Demo Code

```python
for n in range(10):

  i = random.randint(0,len(X_test))
  # pick a sample to predict from the test set
  X_to_predict = X_test[i]
  y_to_predict = y_test[i]

  print("\nReal Genre:",genre_dict[y_to_predict])

  X_to_predict = X_to_predict[np.newaxis, ...]

  prediction = model_cnn.predict(X_to_predict)

  # get index with max value
  predicted_index = np.argmax(prediction, axis=1)

  print("Predicted Genre:",genre_dict[int(predicted_index)])
```

```
Real Genre: rock
Predicted Genre: classical

Real Genre: hiphop
Predicted Genre: hiphop

Real Genre: jazz
Predicted Genre: jazz

Real Genre: jazz
Predicted Genre: jazz

Real Genre: hiphop
Predicted Genre: hiphop

Real Genre: disco
Predicted Genre: disco

Real Genre: reggae
Predicted Genre: reggae

Real Genre: metal
Predicted Genre: metal

Real Genre: jazz
Predicted Genre: jazz

Real Genre: classical
Predicted Genre: classical
```

User Interface



References

Dataset:

- https://www.kaggle.com/andradaolteanu/gtzan-dataset-music-genre-classification

Research Papers:

- https://www.irjet.net/archives/V6/i5/IRJET-V6I5174.pdf
- http://www.cs.cmu.edu/~yh/files/GCfA.pdf
- https://www.researchgate.net/publication/329396097_Music_Genre_Classification_and_Recommendation_by_Using_Machine_Learning_Techniques

THANKYOU!!