



Music Genre Classification using CNNs

CONTENTS

1. Description
2. About Dataset
3. Objectives
4. Algorithm used
5. Results
6. Knowledge gained from this project
7. References

Description

- Classification of Music Genre by implementing CNN
- Explored and compared various features extraction and how they affect the accuracy of the CNN.

About Dataset

I have used GTZAN Dataset

- Number of Genres - 10
- Number of samples - 66000
- Download link

<https://www.kaggle.com/carlthome/gtzan-genre-collection>

Objectives

- Genre Classification using CNN
- Explore and Compare Feature selection techniques(melspectrogram, MFCC, Chroma)

Algorithm

For each feature extraction technique(Melspectrogram, MFCC, Chroma):

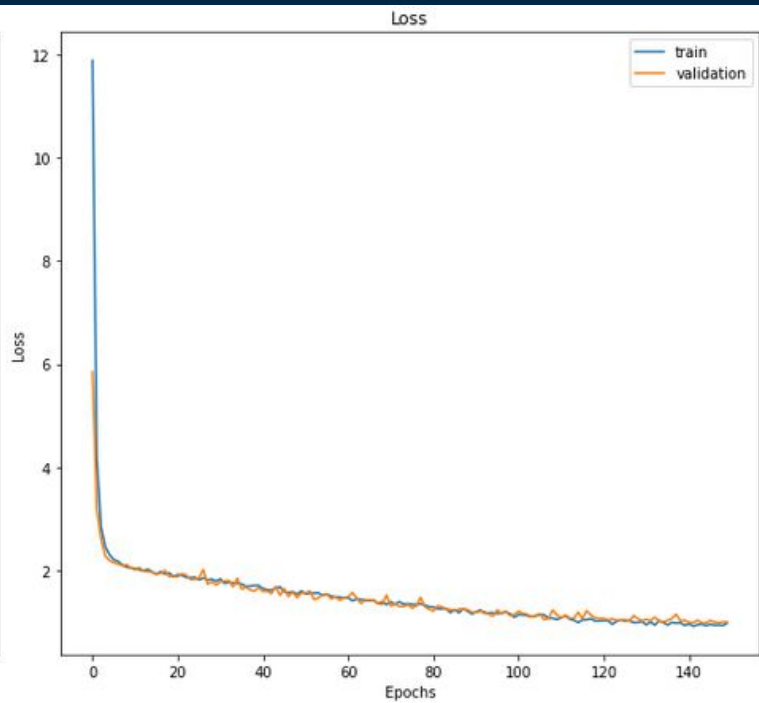
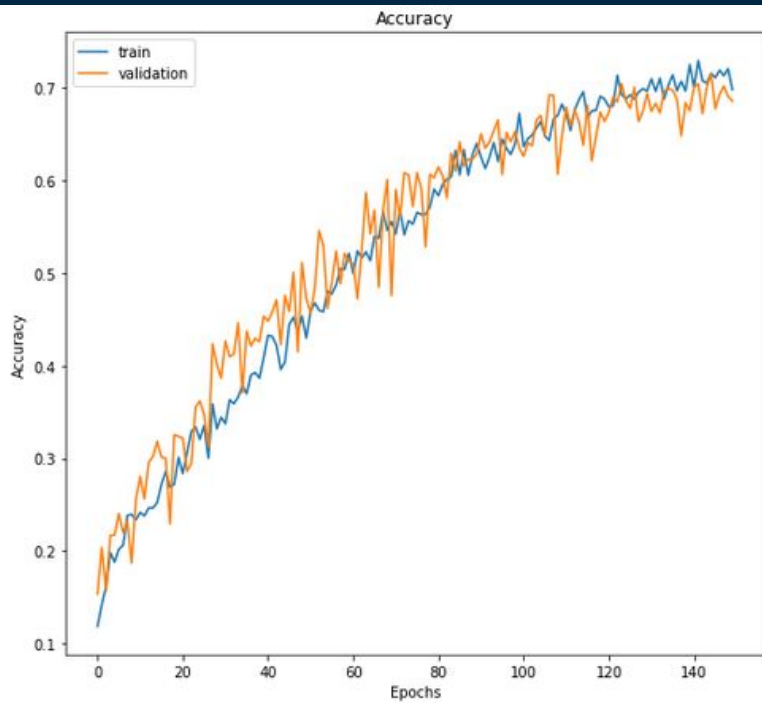
- Shuffle the input and split into train and test (70%/30%).
- Read the audios as their respective feature extraction(e.g in case of MFCC read the audios as MFCC), splitting them into 1.5s windows with 50% overlapping resulting in a dataset with shape (samples x time x frequency x channels)
- Train the CNN and test on test set using a Majority Voting approach

Results

Feature Extraction technique	Accuracy	val_loss	Majority voting
Melspectrogram	70.1%	0.985	78.3%
MFCC	70.3%	0.983	80.7%
Chroma	10%	0.2303	

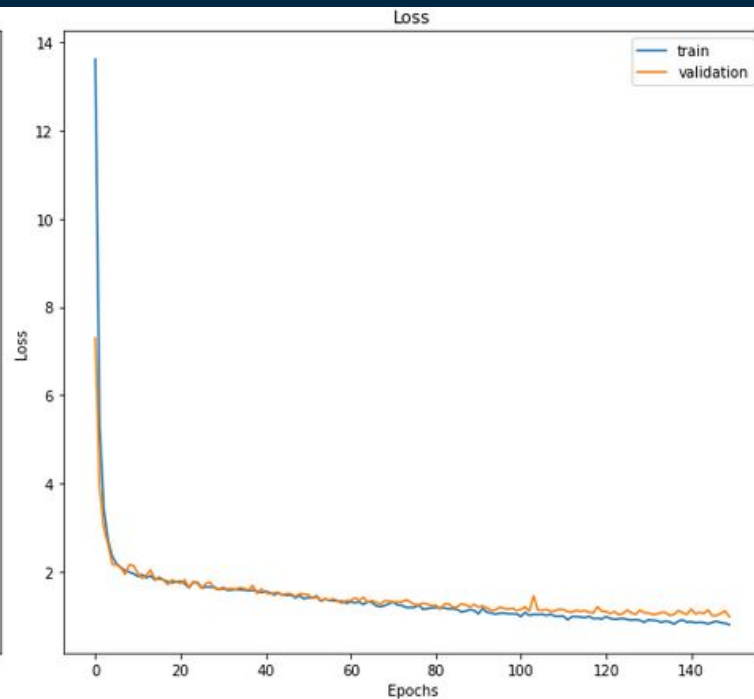
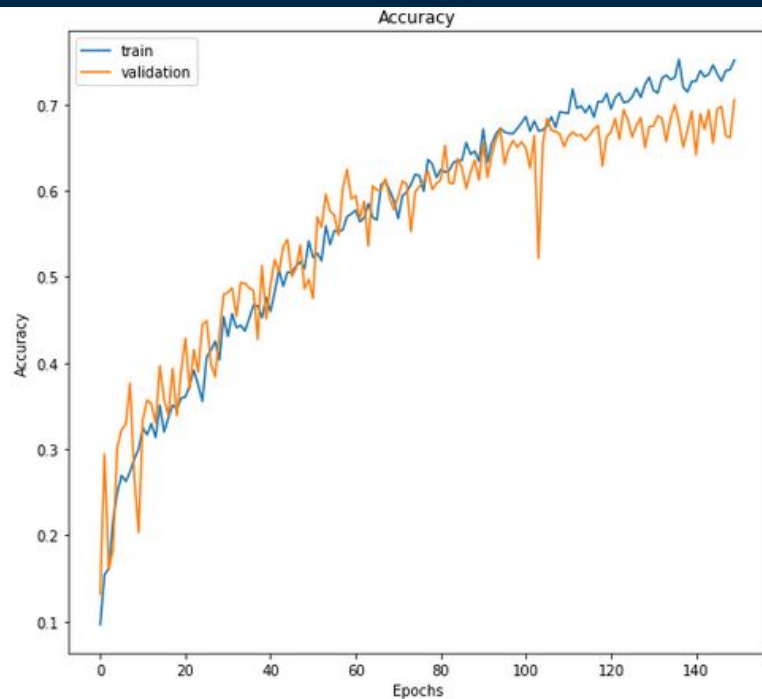
Melspectrogram

01



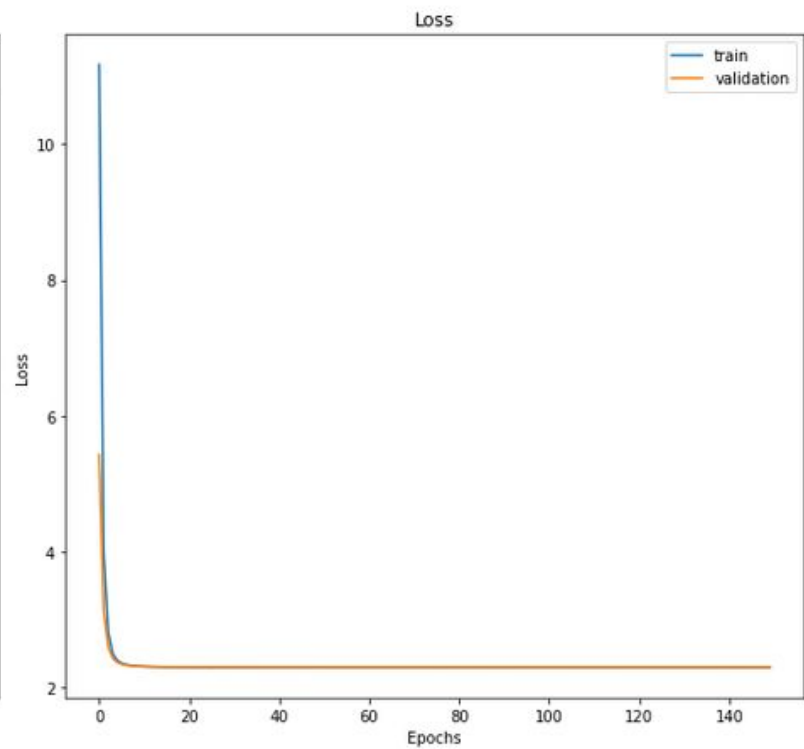
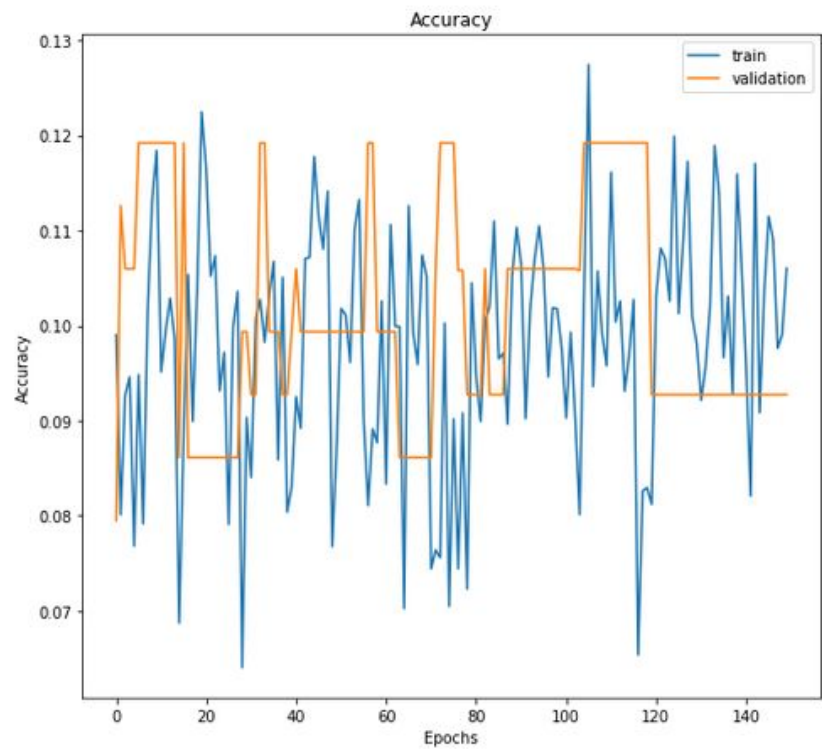
MFCC

02



Chroma(STFT)

03



Knowledge Gained from this project

- Sampling audios
- Different Feature selection criteria for audio Data
- Classification of audio Data using CNN
- Using Github

References

[1]<https://github.com/madhuradole/Music-Genre-Classification-Machine-Learning-/tree/master/MusicGenre>

[2]https://github.com/Hguimaraes/qtzan.keras/blob/master/nbs/1.1-custom_cnn_2d.ipynb

[3]<https://towardsdatascience.com/getting-to-know-the-mel-spectrogram-31bca3e2d9d0>