MUSIC GENRE CLASSIFICATION

Speech and Language Processing with Deep Learning

ETSETB · UPC

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MOTIVATION

- Generate playlists of similar genre.

- Can be used to recommend similar music in digital music services.

- Categorizing music based on genre for other purposes.

STATE OF THE ART

- Music Genre Classification with the Million Song Dataset [Paper]

- Deep content-based music recommendation [Paper]

- WWW 2018 Challenge: Learning to Recognize Musical Genre [Website] [Slides]

  - Transfer Learning of Artist Group Factors to Musical Genre Classification [Paper]
  - Ensemble of CNN-based Models using various Short-Term Input [Website]
  - Detecting Music Genre Using Extreme Gradient Boosting [Paper]
  - ConvNet on STFT spectrograms

DATASETS

Million Song Dataset ➡ 1,000,000 tracks

FMA (Music Analysis) ➡ 13,129 tracks - 163 genres
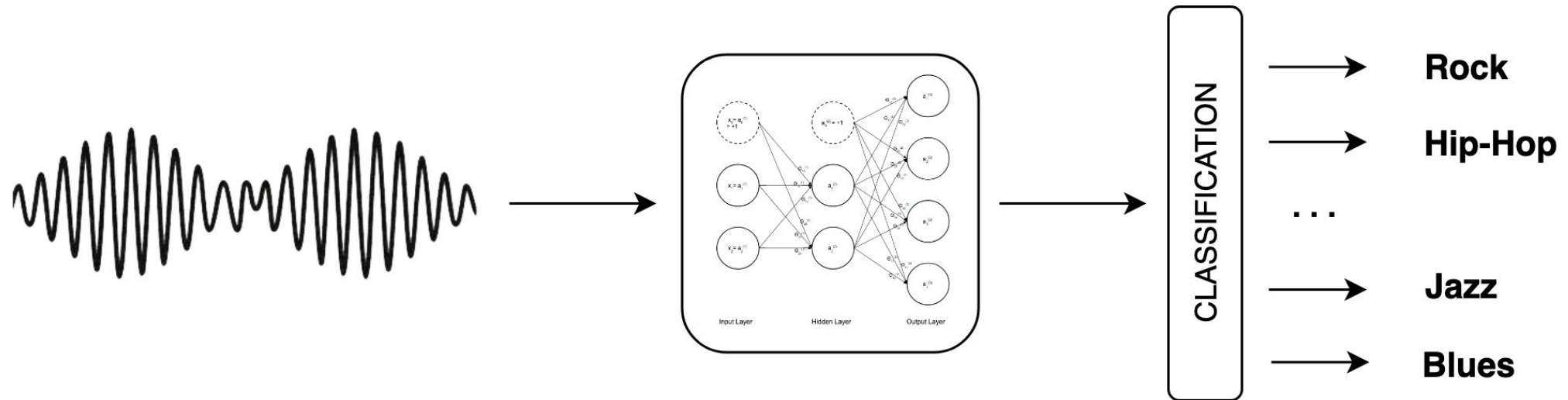
GTZAN Genre Collection ➡ 1000 tracks - 10 genres

Music Acoustic benchmark ➡ 1886 tracks - 9 genres

GENERAL SETUP

Dataset: 60% train - 20% validation - 20% test

IMPLEMENTATION
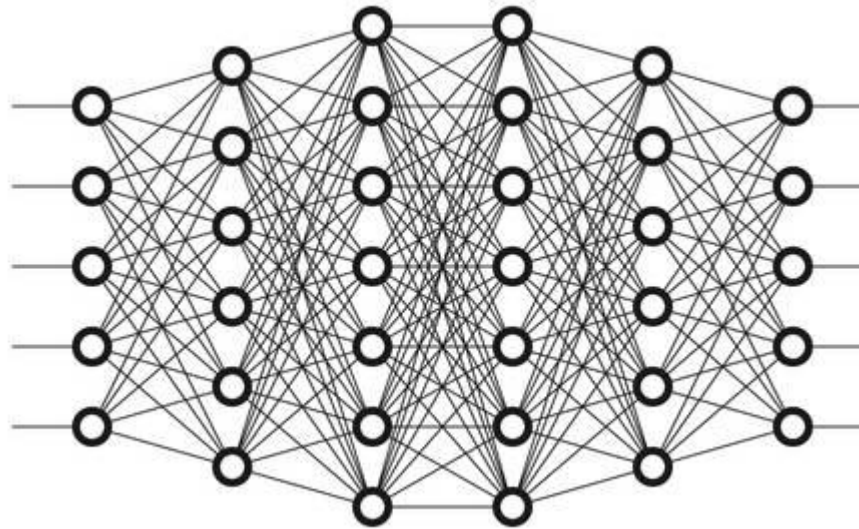
Hand Crafted Features + DNN

Chroma STFT

Spectral Centroid

Spectral Bandwidth

Spectral Rolloff

Zero-Crossing Rate
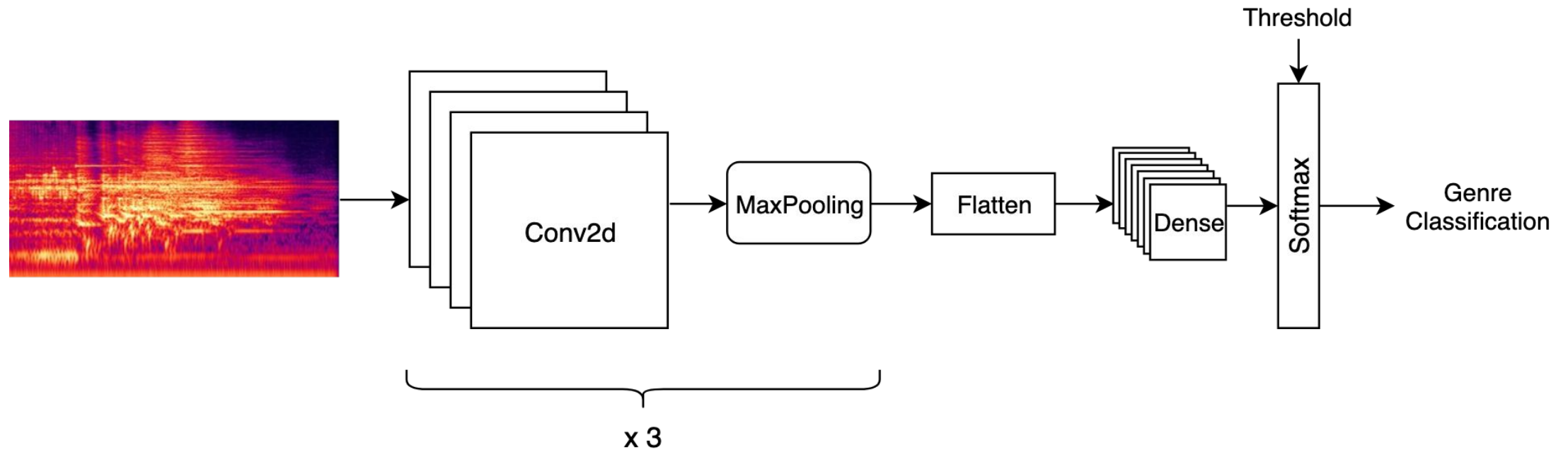
MFCC (20)

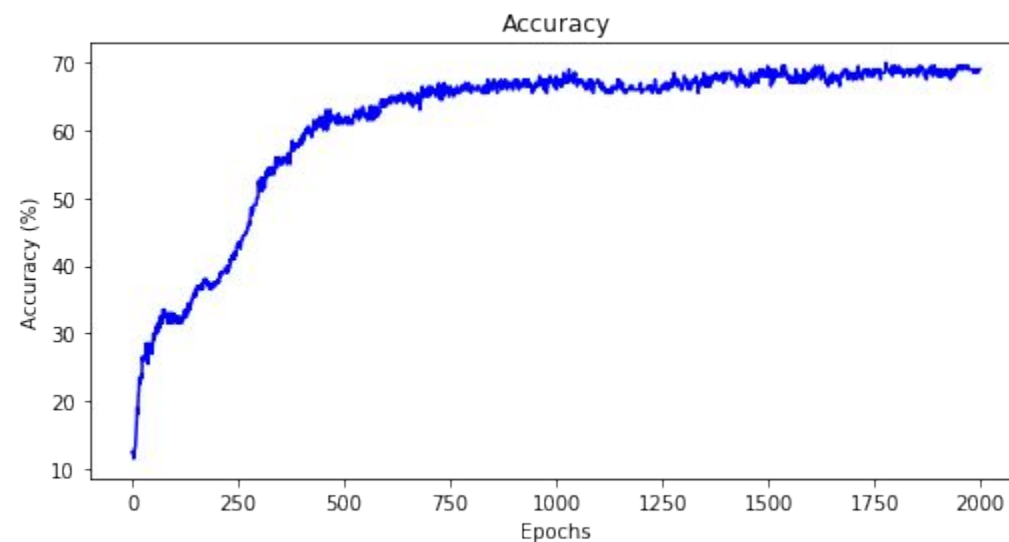CLASSIFICATION

Rock
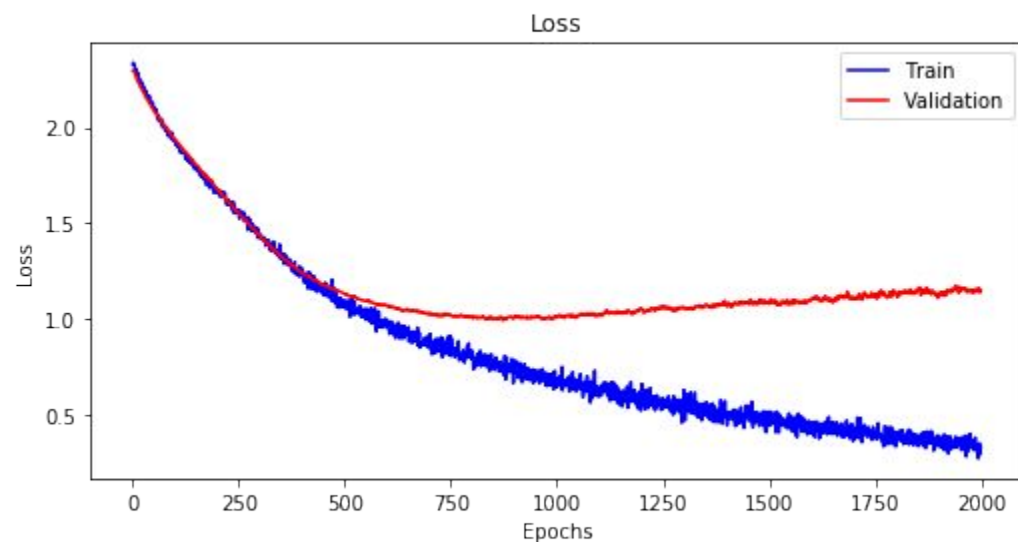
Hip-Hop

...

Jazz

Blues

IMPLEMENTATION

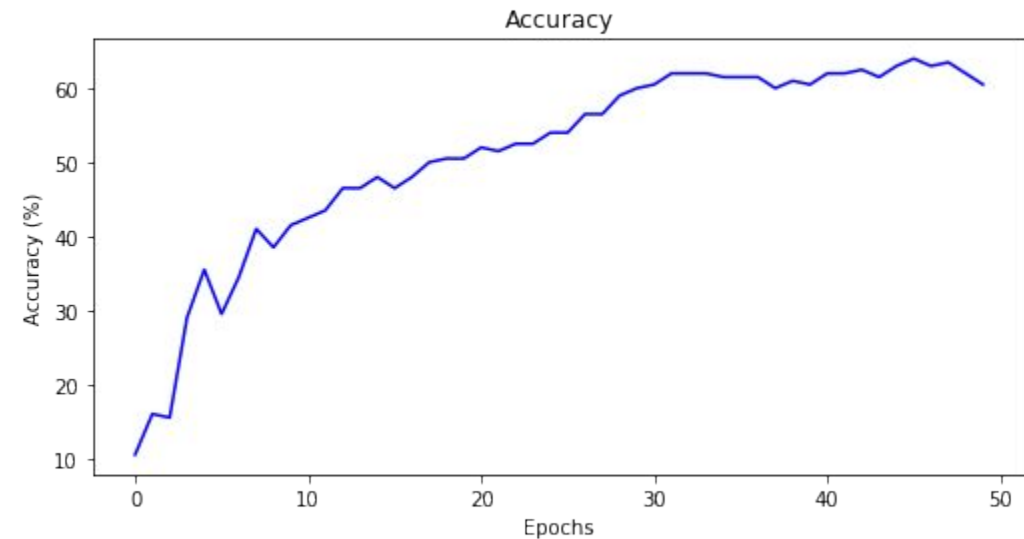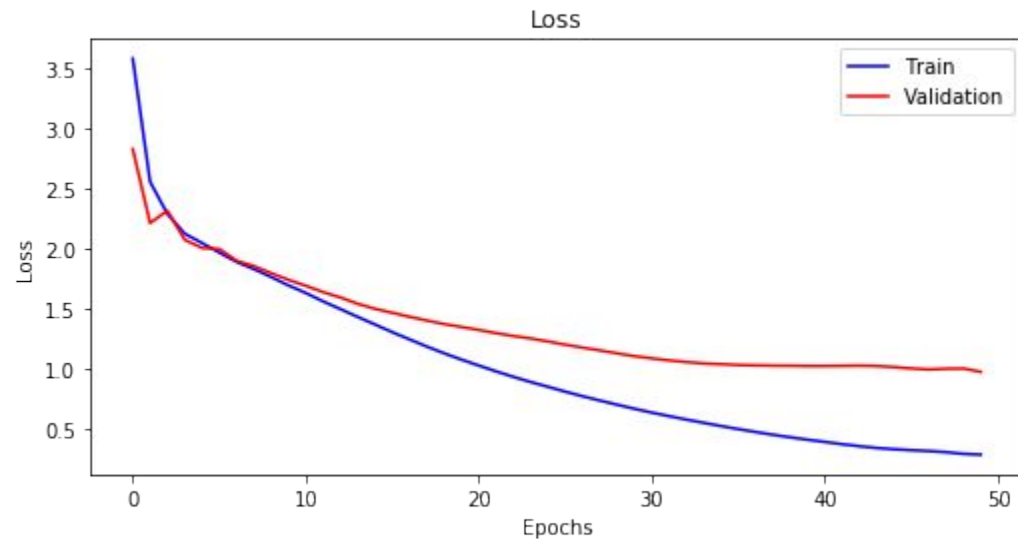**Mel Spectrogram + CNN-2D**

EARLY RESULTS - Hand Crafted Features + DNN

Accuracy (Test Set)

136/200 **(68%)**

EARLY RESULTS - Mel Spectrogram + CNN-2D

Accuracy (Test Set)

113/200 **(56%)**

CONCLUSIONS

What do we have achieved so far?

- We have implemented 2 different approaches
- We have achieved an accuracy of **68% (DNN)** and **56% (CNN)**

Next steps:

- Train with larger datasets (Million Song Dataset) + Data augmentation
- Small changes in the architecture (regularization, dropout, batch normalization)
- Hyperparameter tuning
- **Mel Spectrogram + CNN-1D + LSTM**
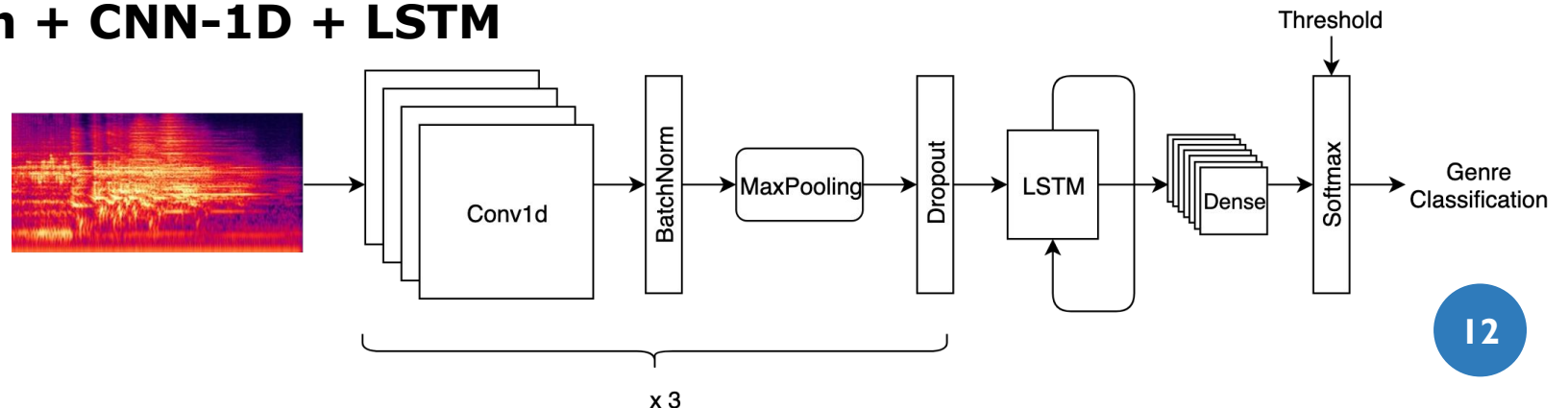
THANKS FOR YOUR ATTENTION

Questions?

Carles García