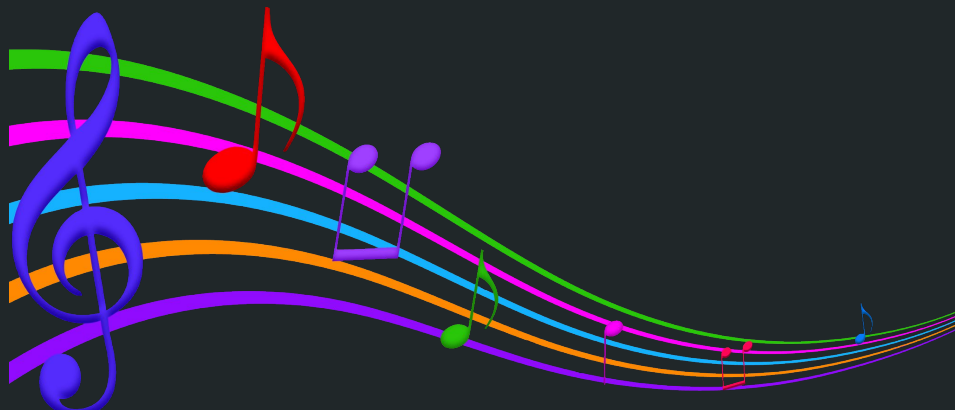
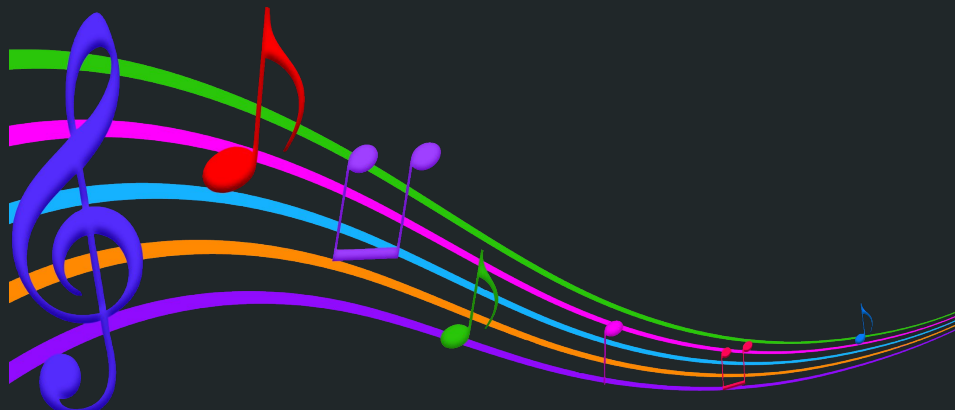
Using Neural Nets to Predict Music Genre from Waveforms

Dayv Doberne



Background



Background

- Genres
  - Loosely divided categories of music
  - Change over time
  - Eg. ‘Pop’

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  - Loosely divided categories of music
  - Change over time
  - Eg. ‘Pop’
- Fashion is cyclical!

Background

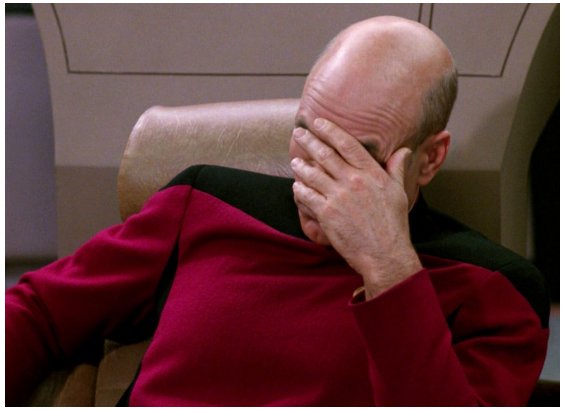
- Can we train NNs to classify genre?

Background

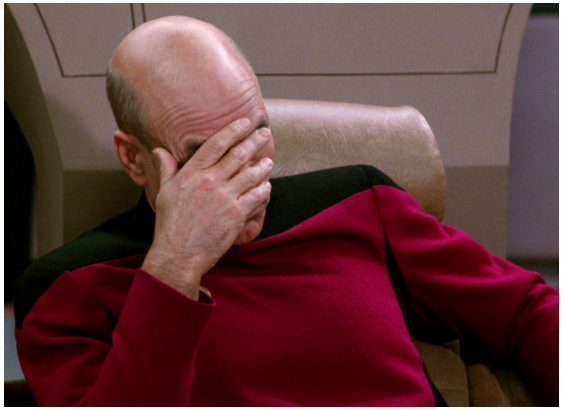
- Can we train NNs to classify genre?
- Then we can use that model to forecast trends!

42%

Model prediction accuracy



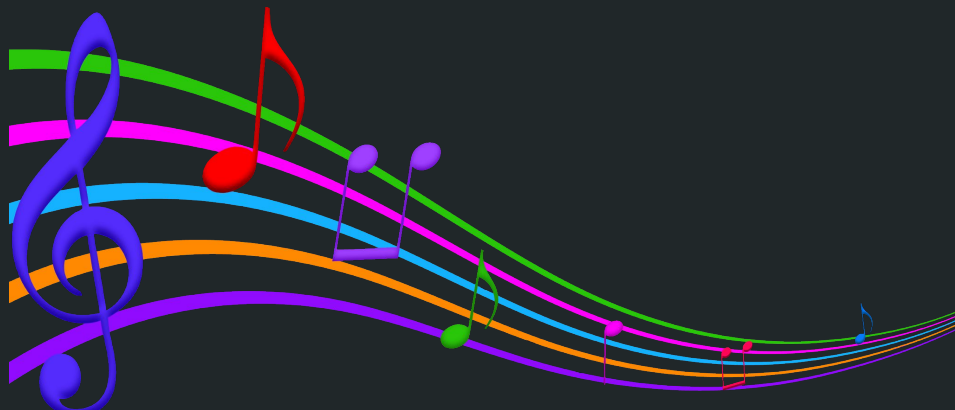
42%



Model prediction accuracy

(not enough for forecasting)

Data

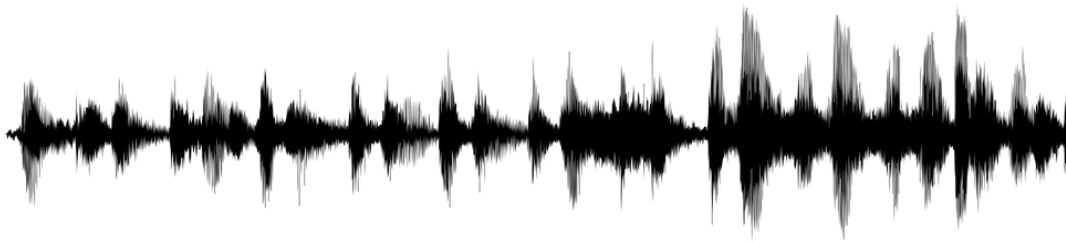


Data

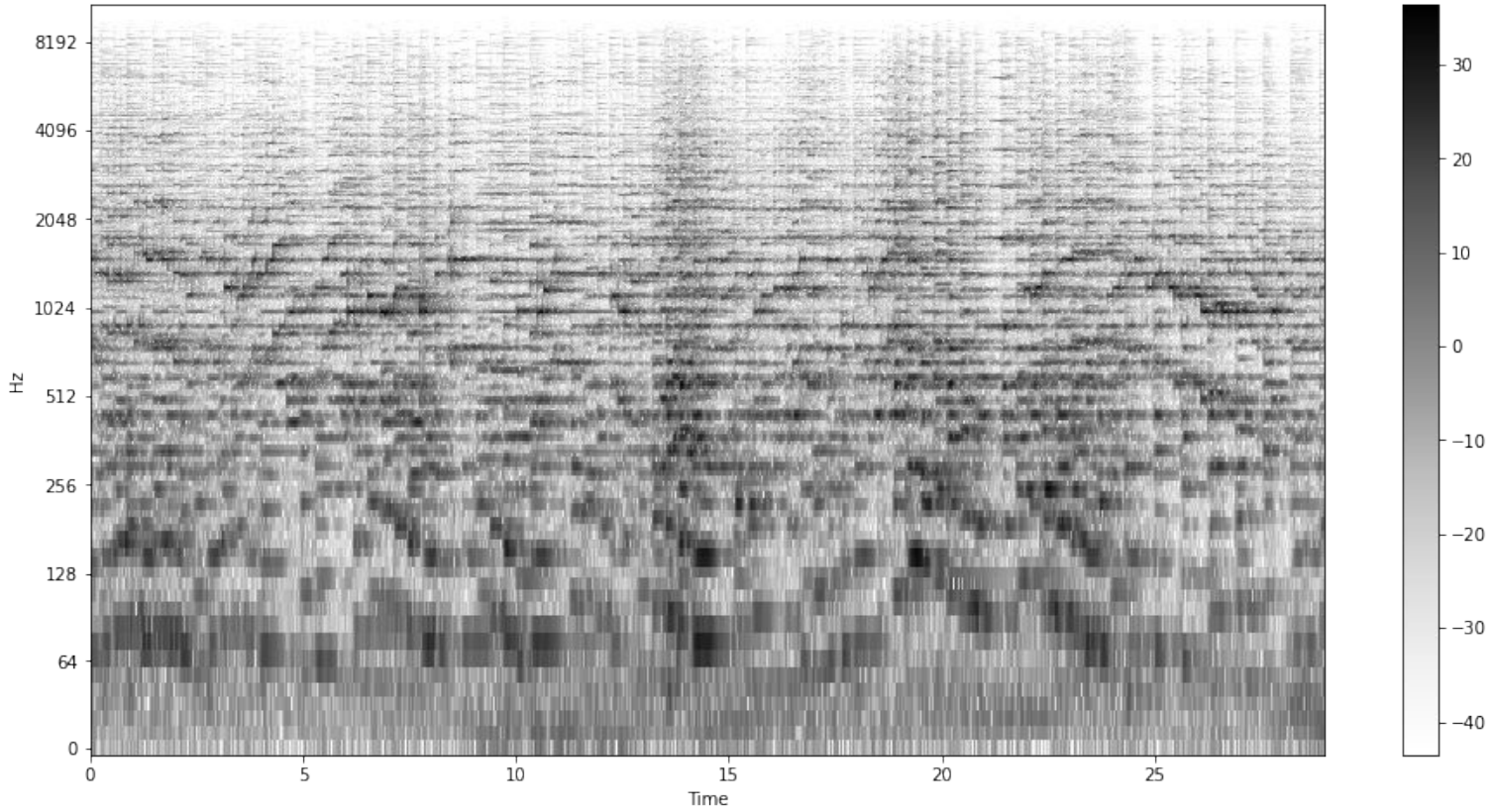
- GTZAN data set
  - Blues, Classical, Country, Disco, Hiphop, Jazz, Metal, Pop, Reggae, Rock
  - 100 30s clips of each

Data

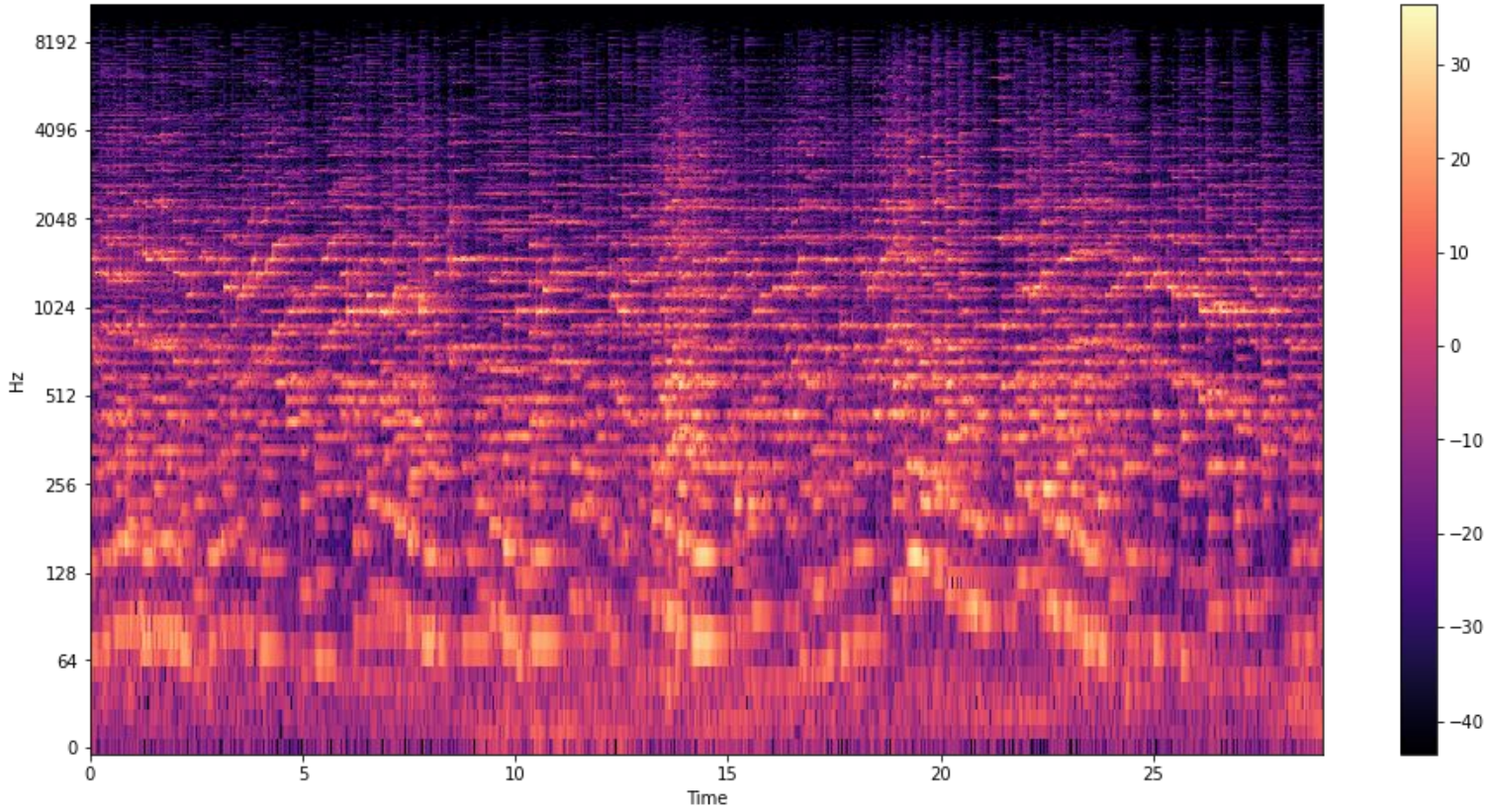
- Librosa library
  - Converts waveform to vector
  - Can transform vector into 2D array



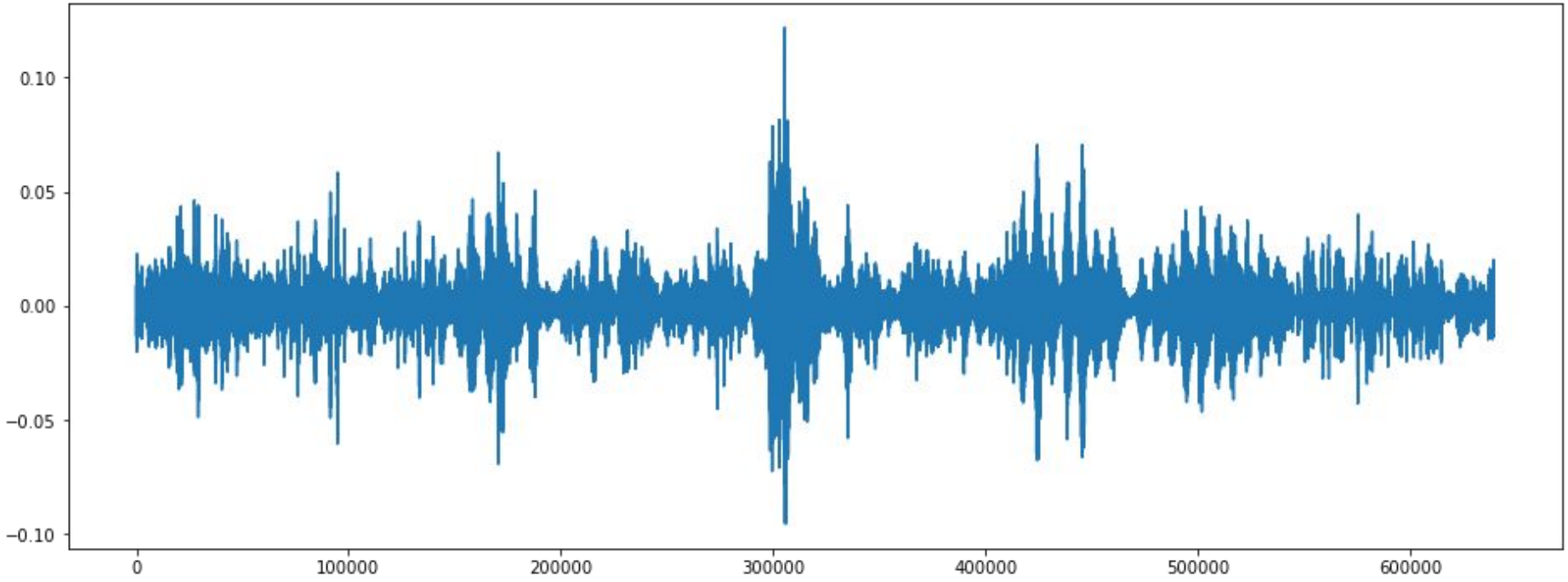
Spectogram


8192
4096
2048
1024
512
256
128
64
0
Hz
0
5
10
15
20
25
Time
30
20
10
0
−10
−20
−30
−40

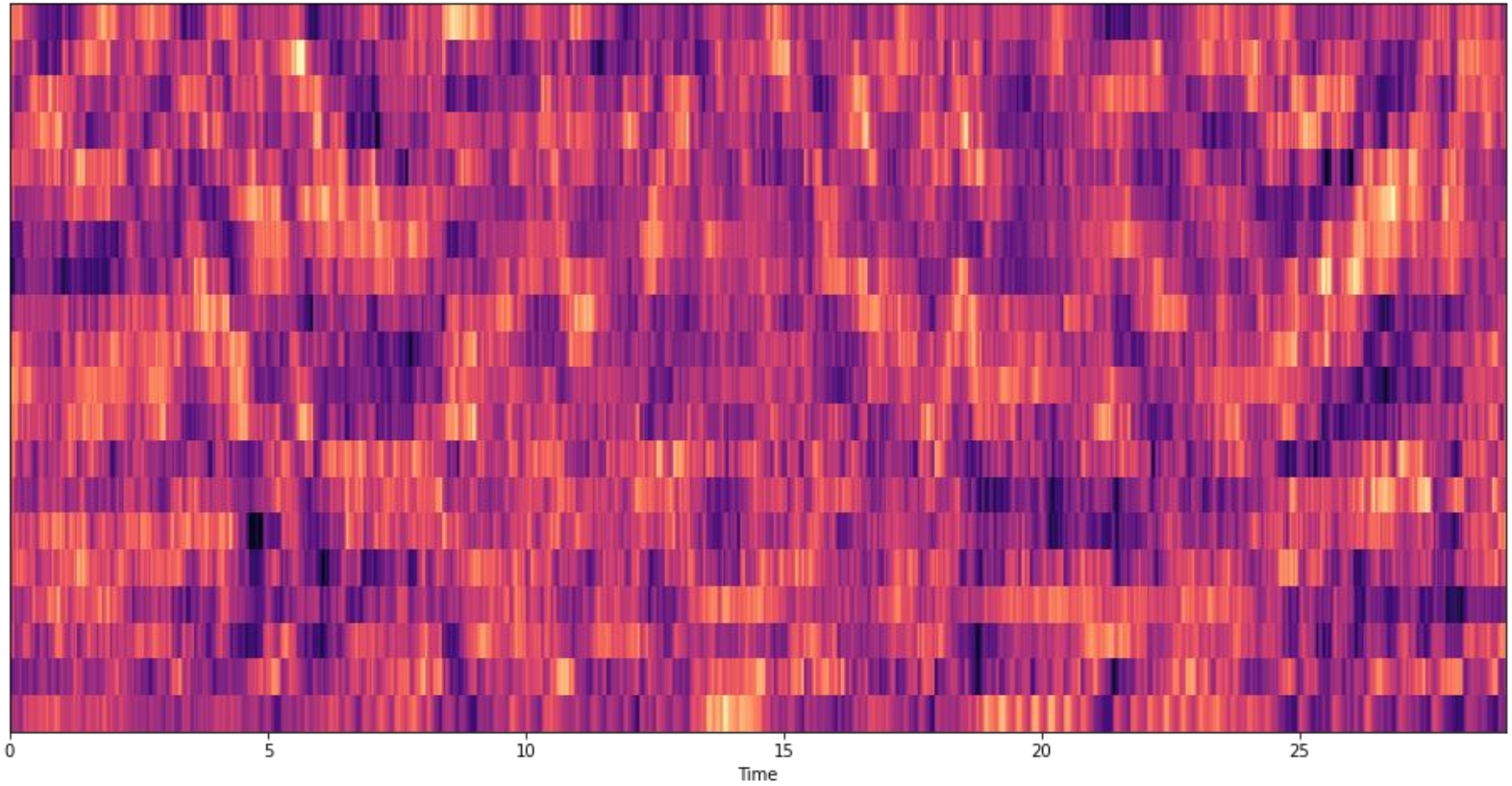
Spectogram


8192
4096
2048
1024
512
256
128
64
0
Hz
0
5
10
15
20
25
Time
30
20
10
0
−10
−20
−30
−40

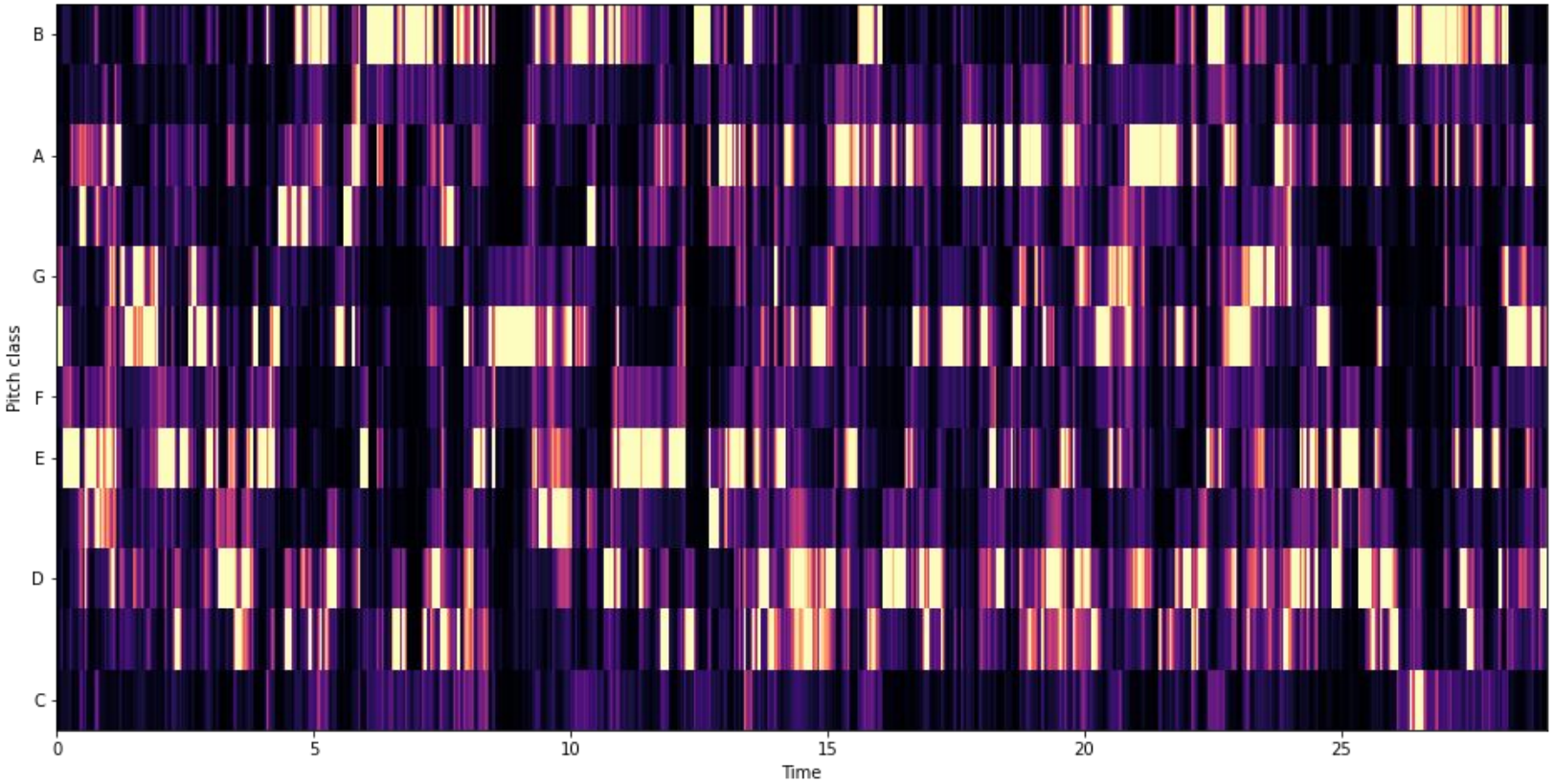
Percussion


0.10
0.05
0.00
−0.05
−0.10
0
100000
200000
300000
400000
500000
600000

Mel-Frequency Cepstral Coefficients

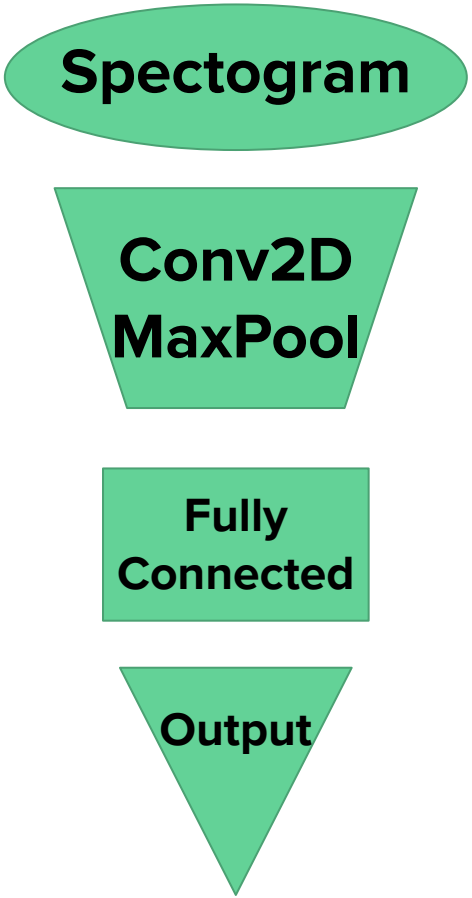


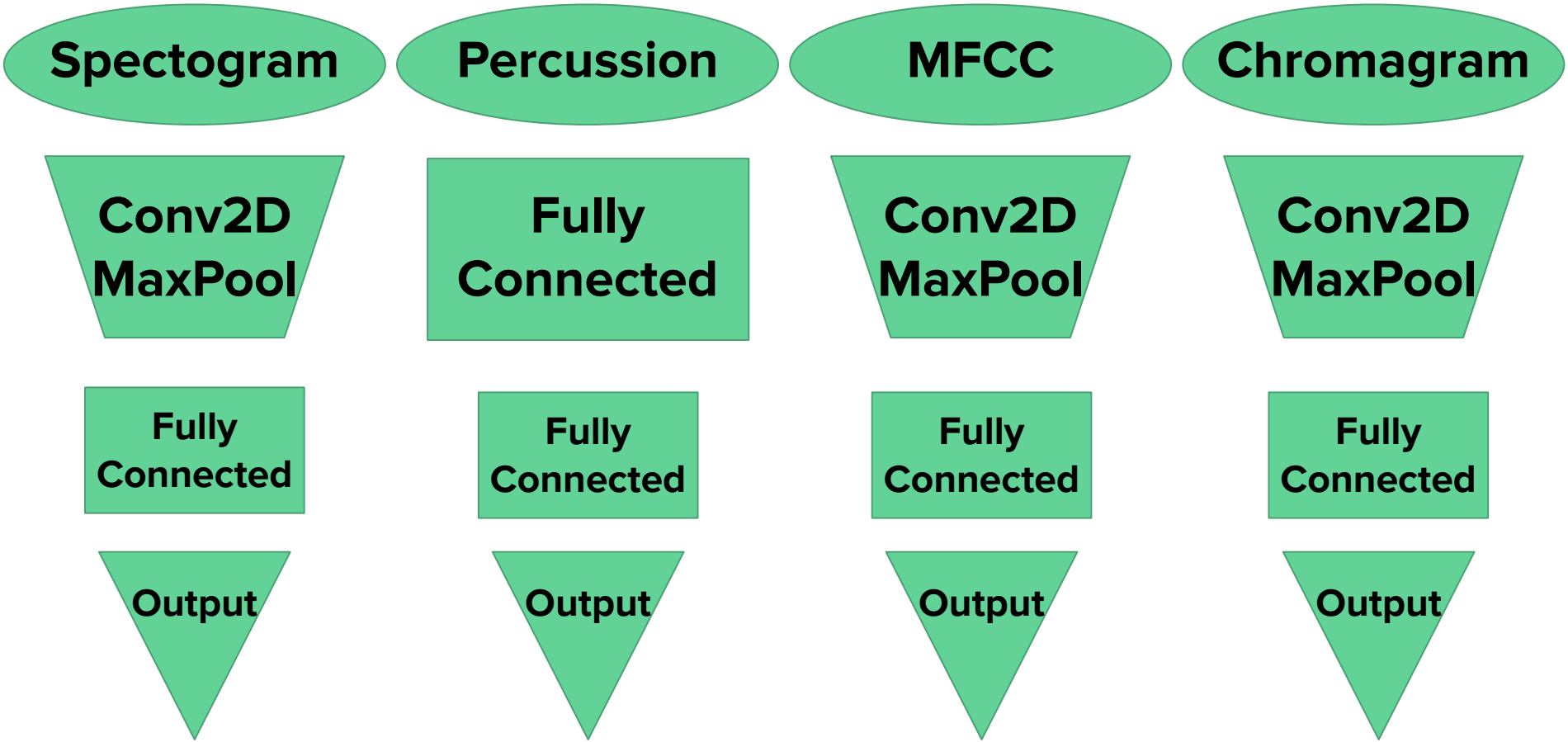
Chromagram



Data

	NN Type	Test Accuracy
Spectogram	2D CNN	**.38**
Percussion	Fully connected	.23
MFCC	2D CNN	.30
Chromagram	2D CNN	.35


Spectogram
Conv2D
MaxPool
Fully
Connected
Output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Fully
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Fully
Connected
Output
Output
Output
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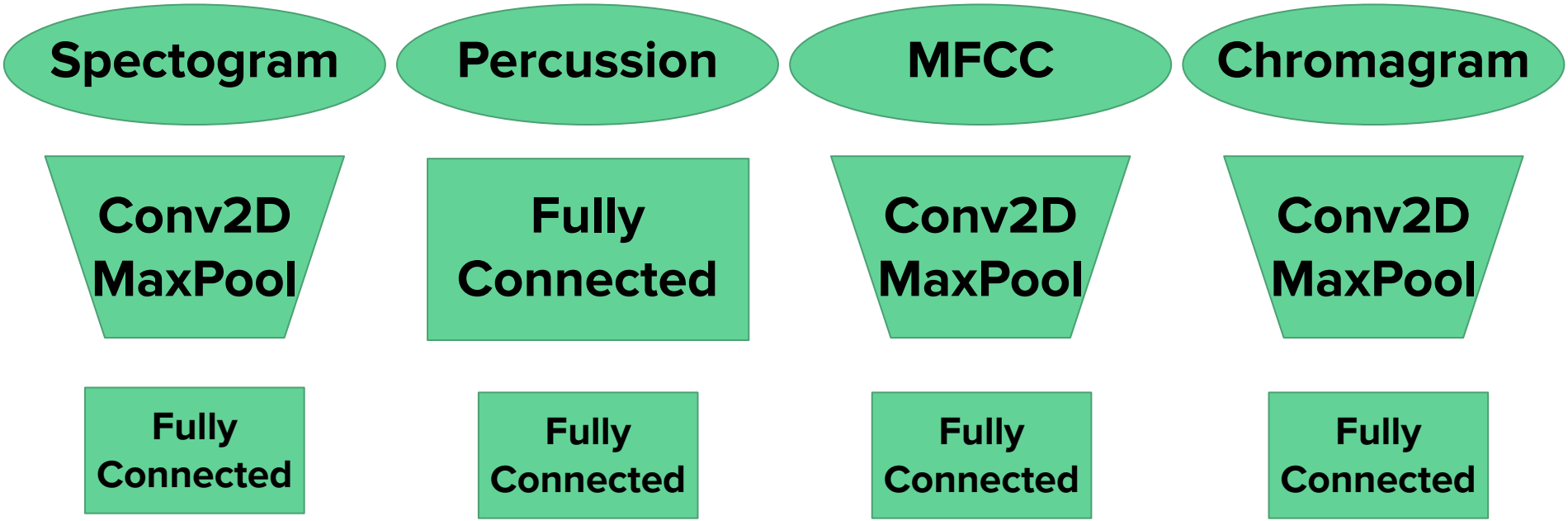
Spectogram
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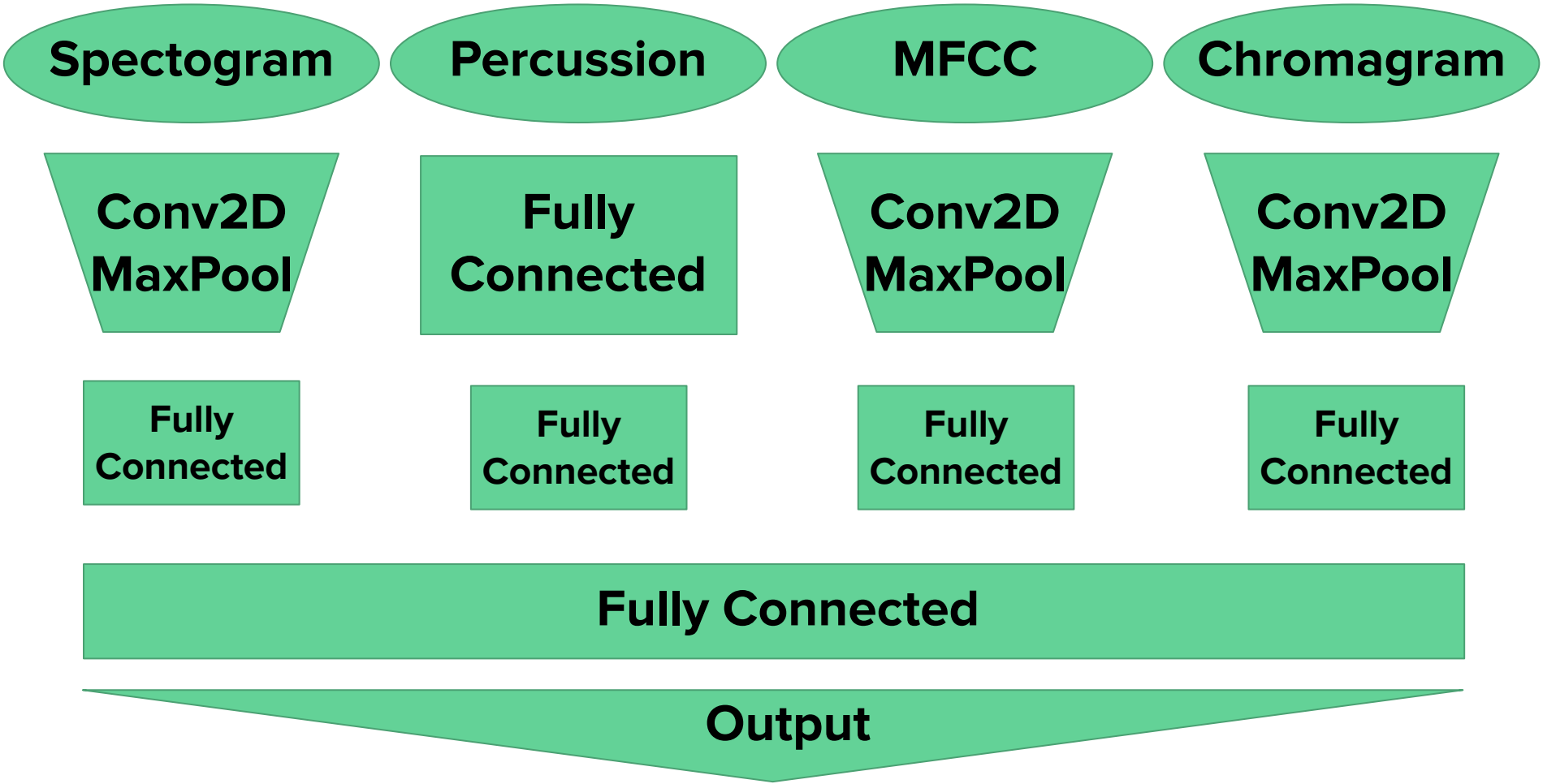
Spectogram
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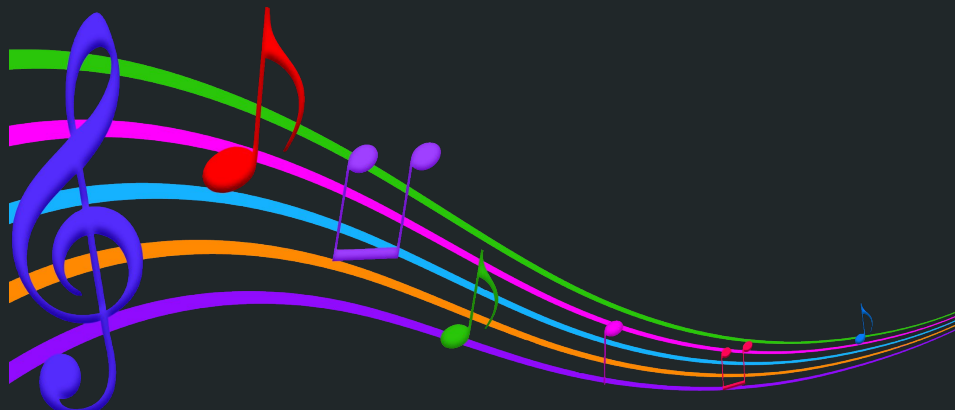
Fully
Connected
Fully
Connected
Fully Connected
Output

42%

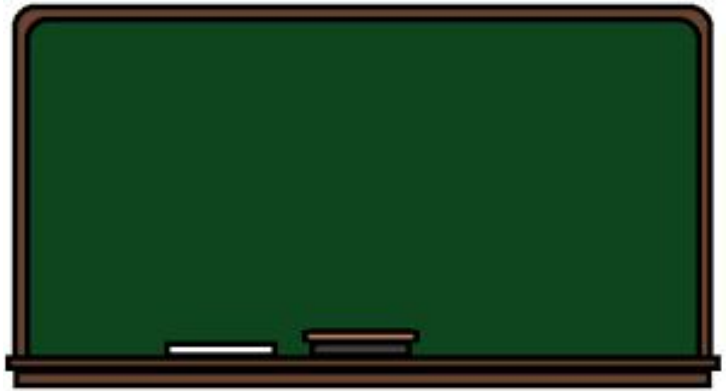
Model prediction accuracy

What’s next?



What’s next?

- Back to the drawing board



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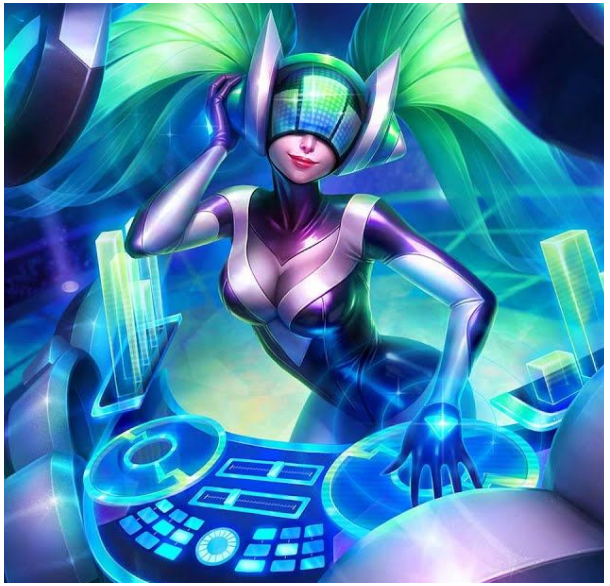
- Back to the drawing board
- Look at what other people have done
  - Other folks claim to be 90%+ with this dataset

What’s next?

- Back to the drawing board
- Look at what other people have done
  - Other folks claim to be 90%+ with this dataset
- Include other genres!



End.