

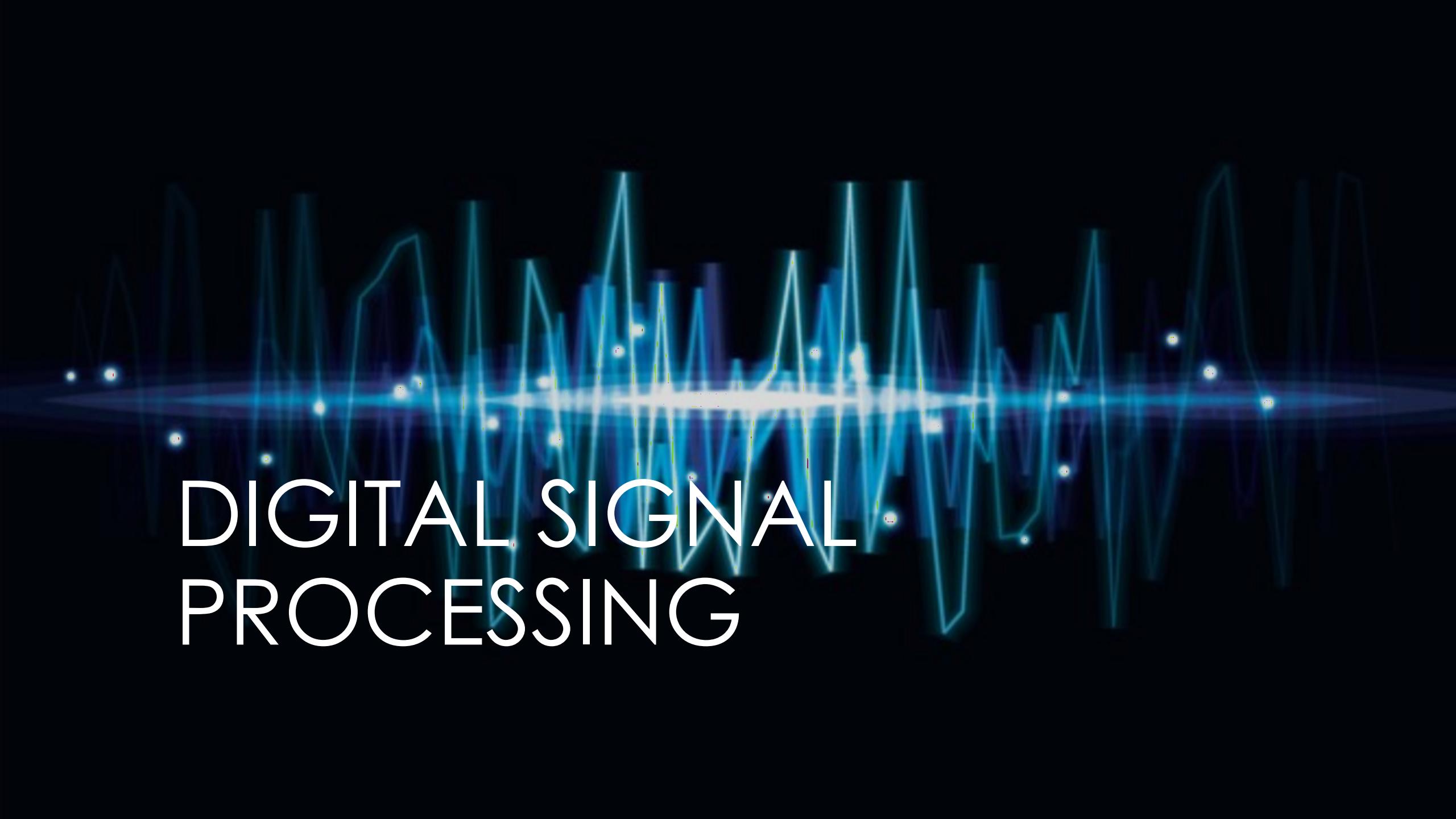


MUSICAL GENRE CLASSIFICATION

Leland Roberts

What do I use
as features?

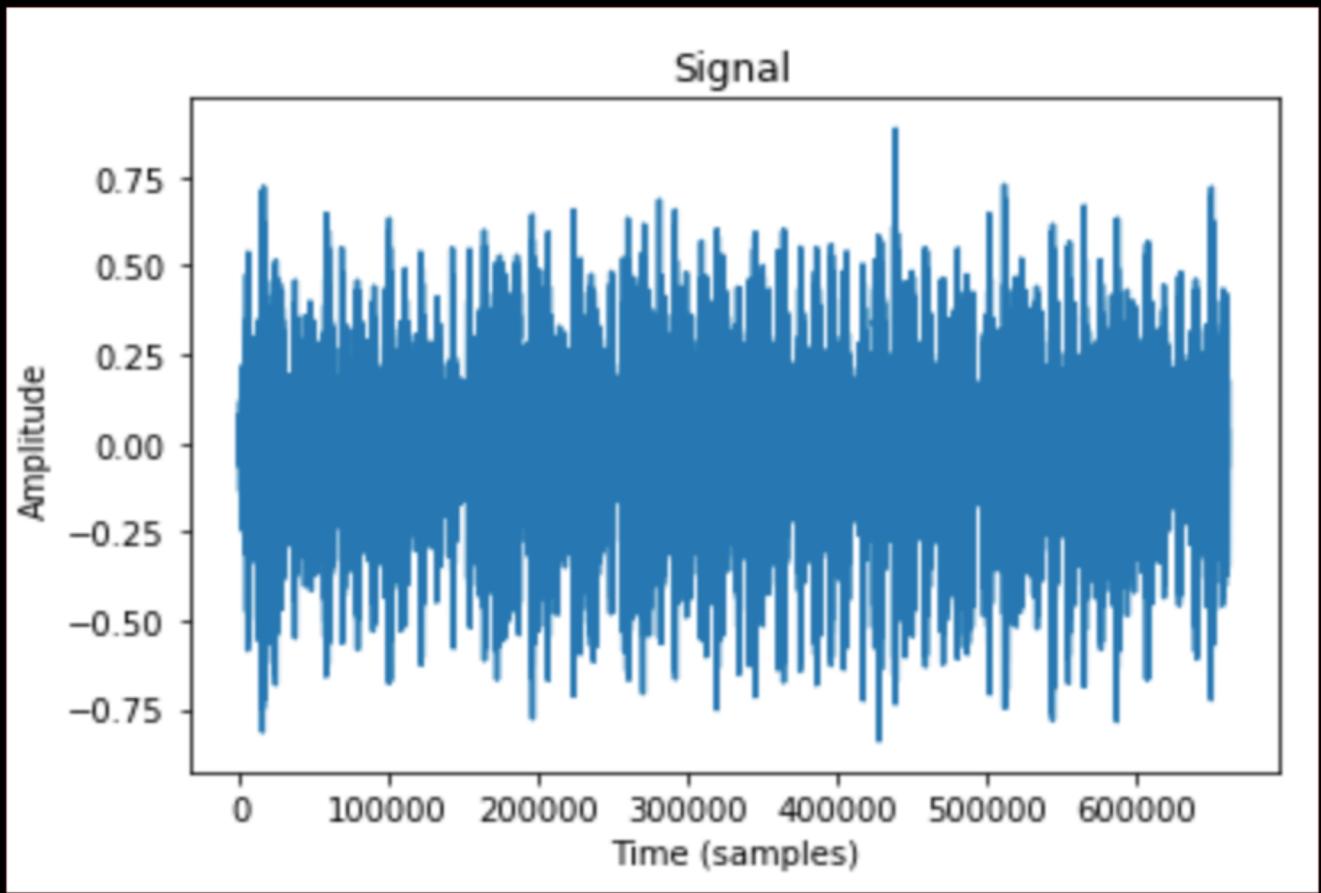




DIGITAL SIGNAL PROCESSING

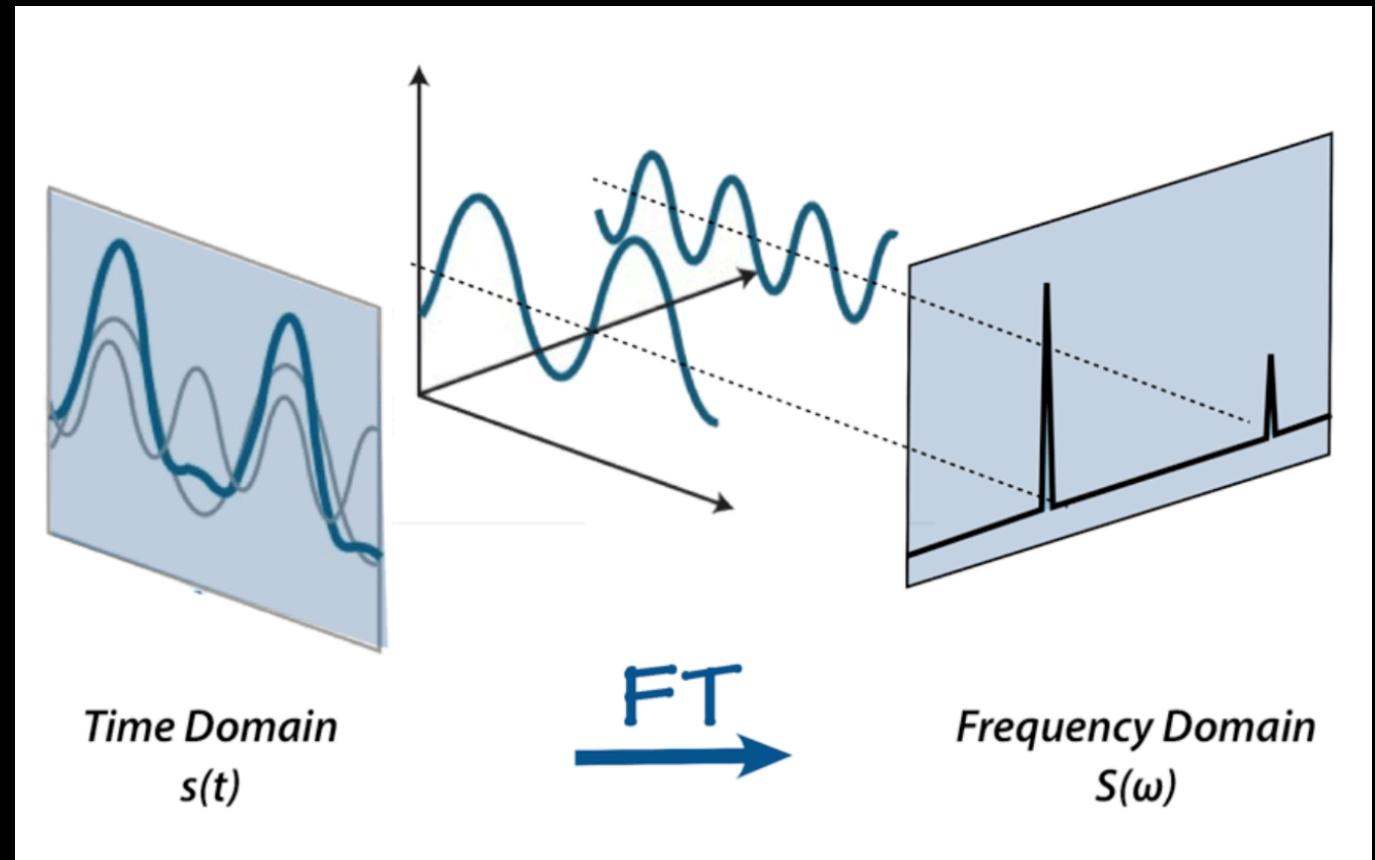
SIGNAL

A signal is a variation in a certain quantity over time.



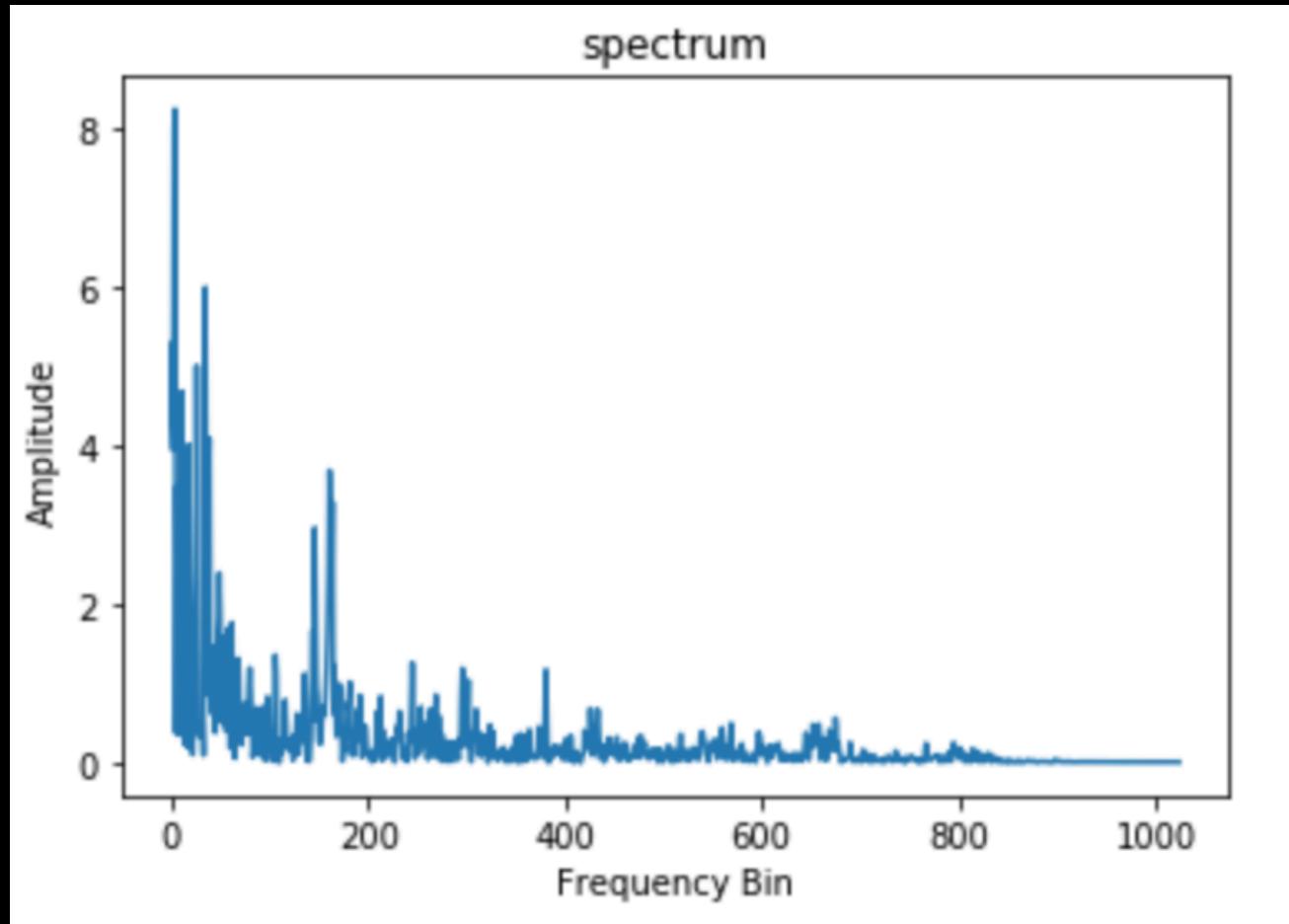
FOURIER TRANSFORM

The **Fourier transform** is a mathematical formula that converts the signal from the time domain into the frequency domain.



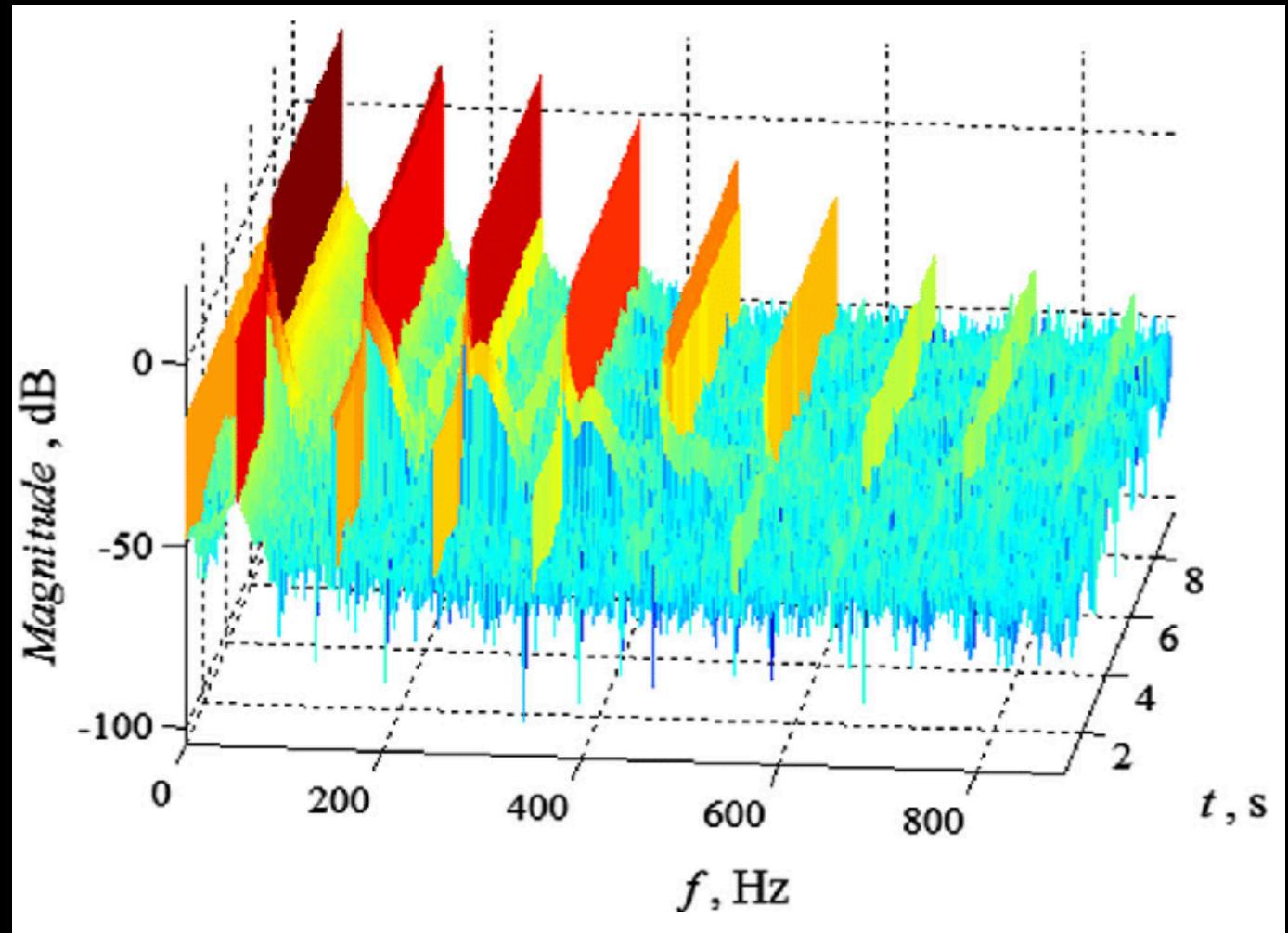
SPECTRUM

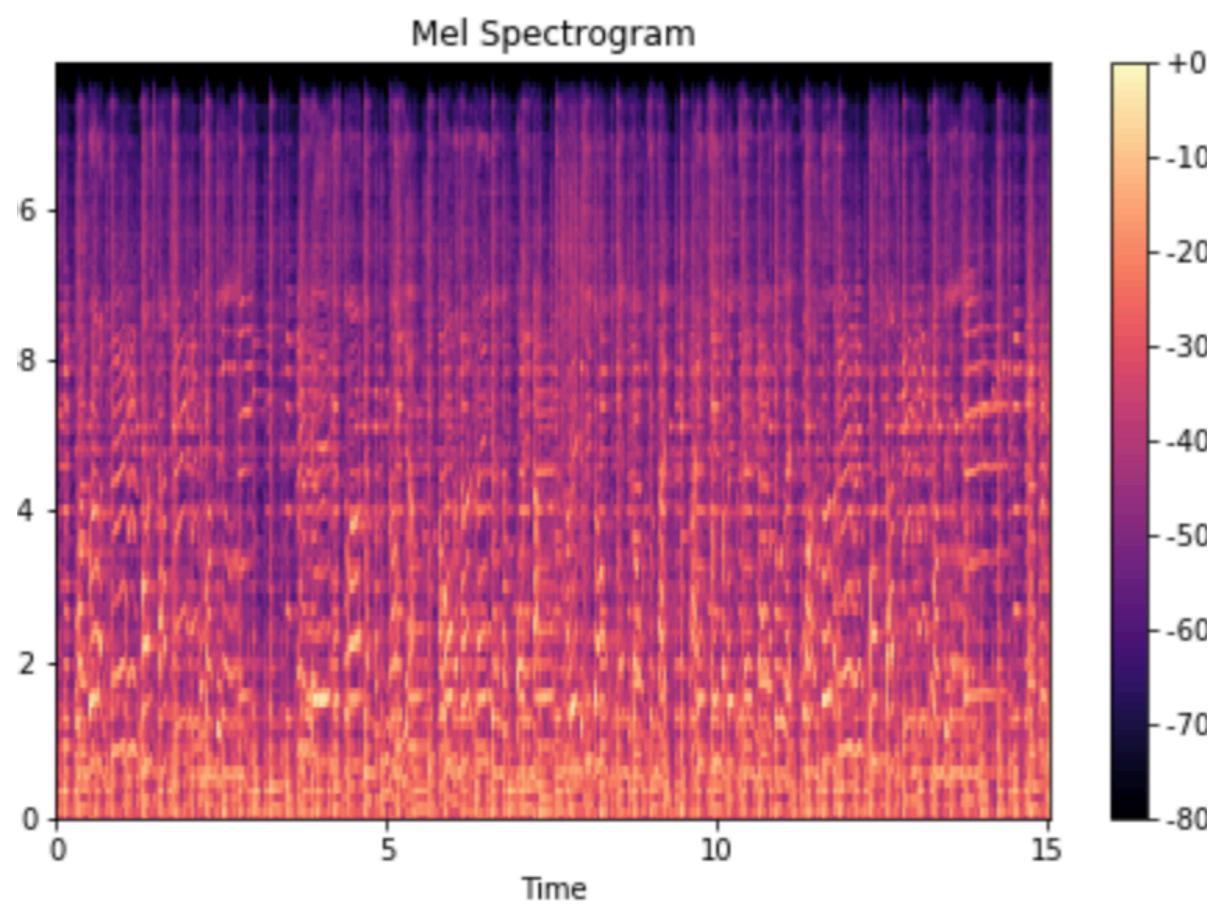
The **spectrum** is the distribution of amplitudes for each frequency component of the signal.



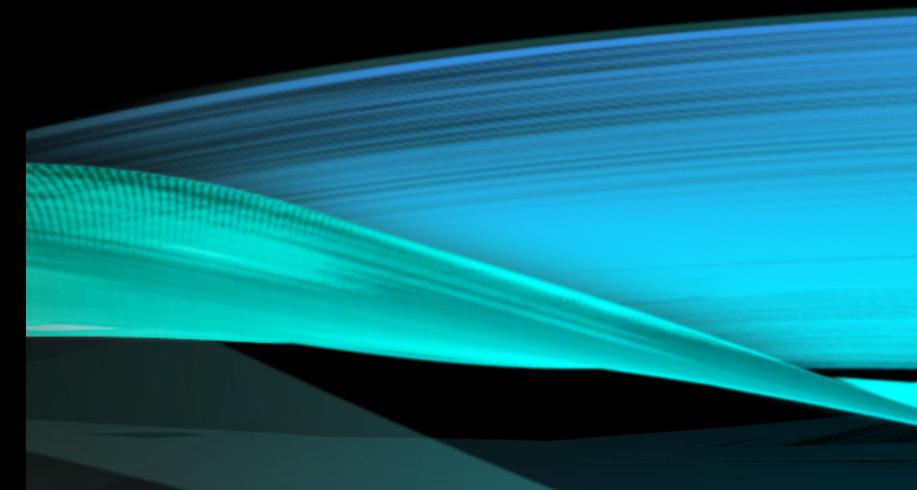
SPECTROGRAM

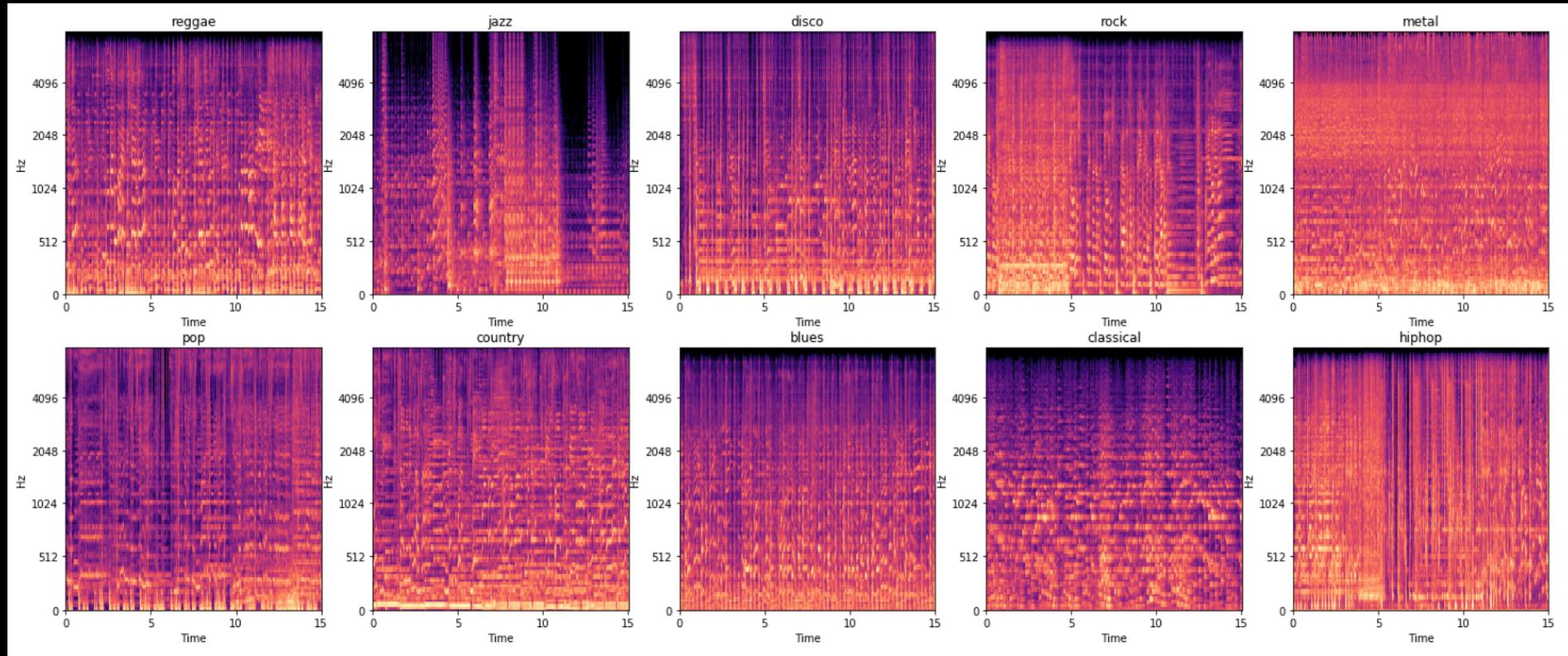
The **spectrogram** represents how the spectrum of frequencies vary over time.





MEL
SPECTROGRAM

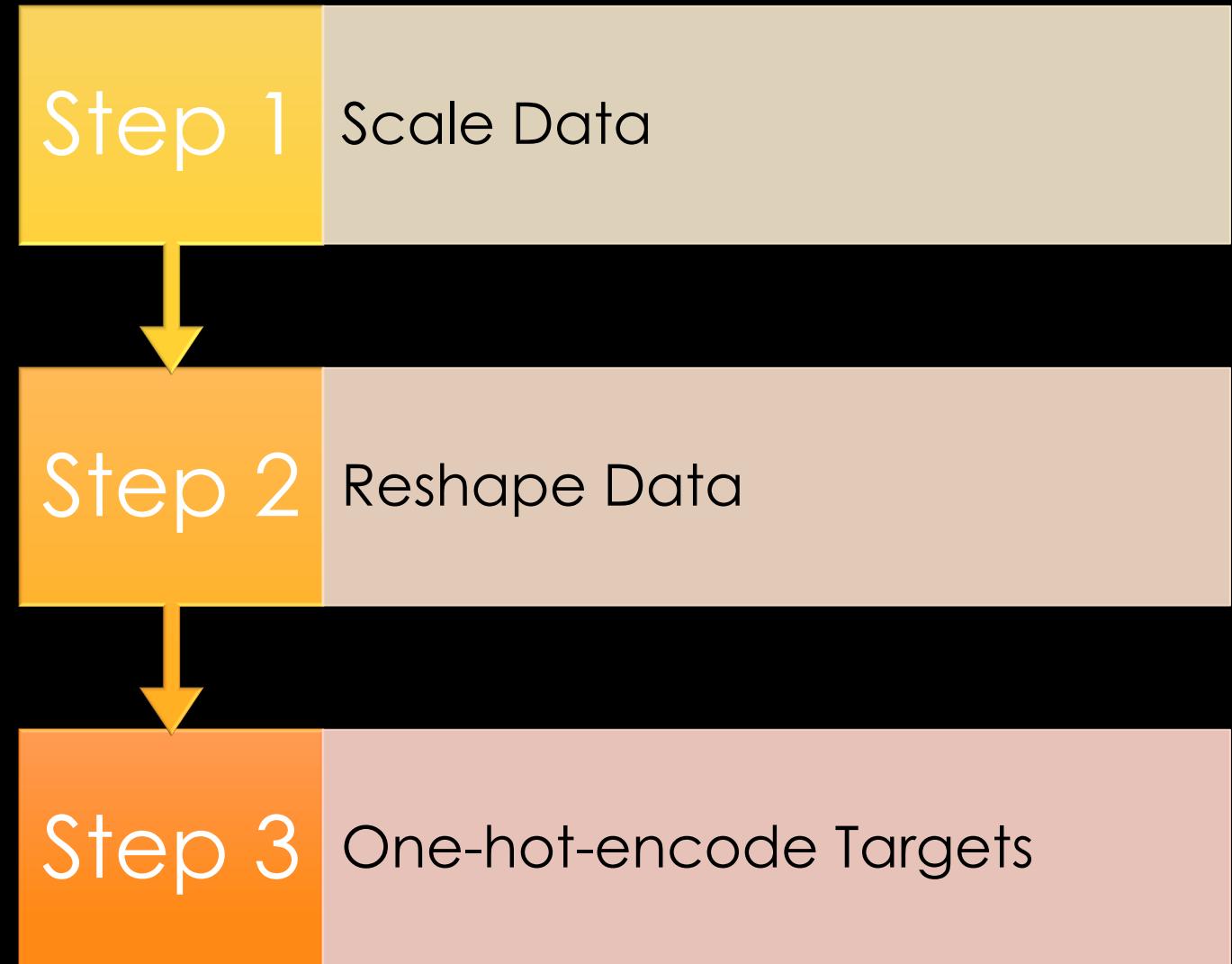




AN IMAGE CLASSIFICATION TASK!

Using mel spectrograms as features,
train a convolutional neural network
to classify the genre of a song

PREPROCESSING STEPS



HOW DID THE CNN DO?

FFNN

CNN

TRAINING SCORE

69%

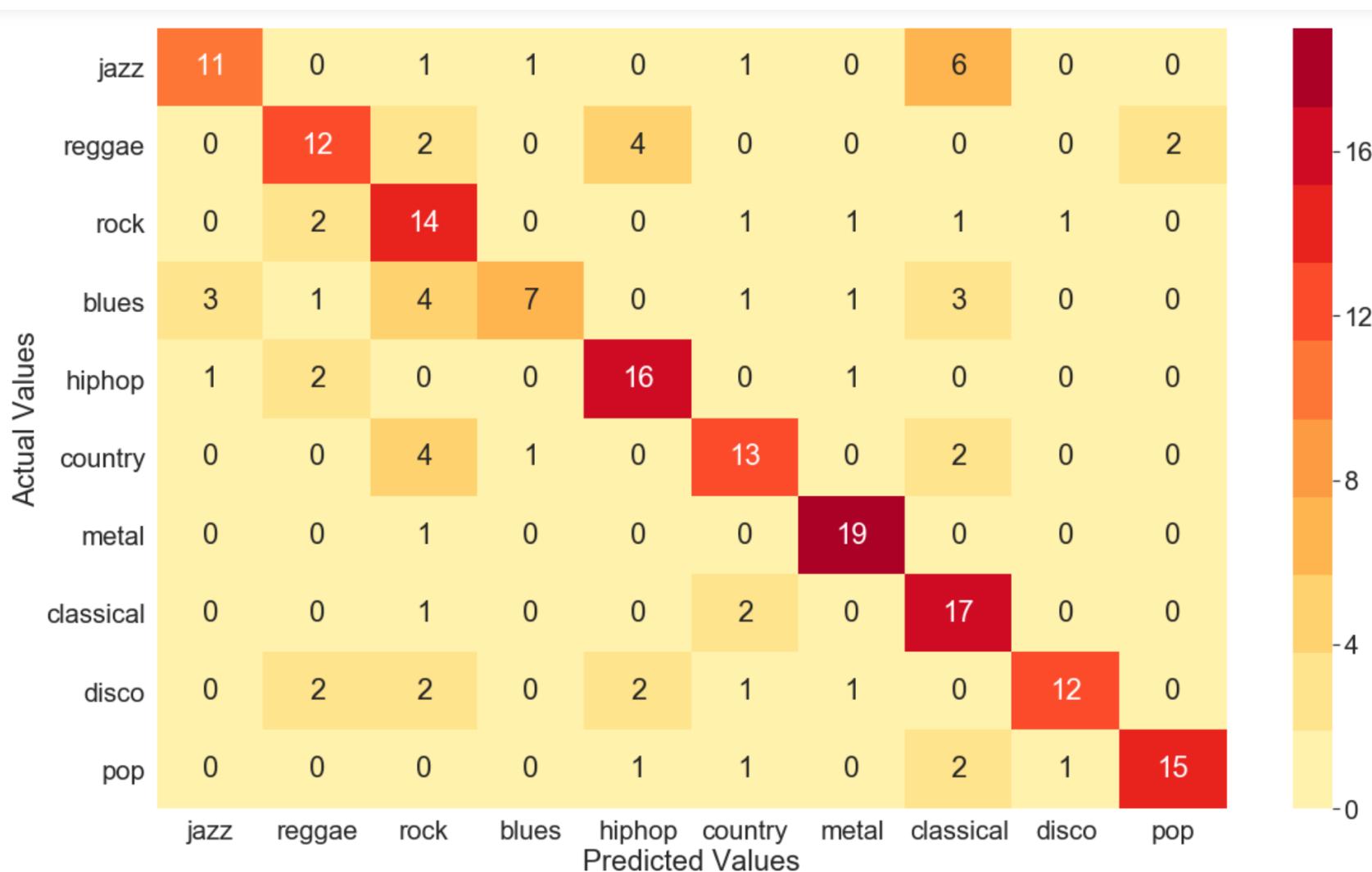
84%

TESTING SCORE

45%

68%

PREDICTIONS VS ACTUAL VALUES



MODELING WITHOUT ROCK, BLUES, OR REGGAE

	CNN WITH ALL GENRES	CNN WITH SUBSET
TRAINING SCORE	84%	93%
TESTING SCORE	68%	81%

FUTURE RESEARCH

01

Try binary classifications to see which two genres the algorithm misclassifies the most

02

Experiment with numerical features such as mel-frequency cepstrum coefficients (MFCC)

03

Gather additional data

THANK YOU!

REFERENCES

- https://www.researchgate.net/figure/D-example-of-spectrogram-time-frequency-representation-for-investigated-circuit_fig6_331990399
- <https://www.uidownload.com/free-vectors/dynamic-audio-waves-04-161685>
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