Oregon State University

# Music Sentiment Analysis

Shaun Leib

soundbendor lab

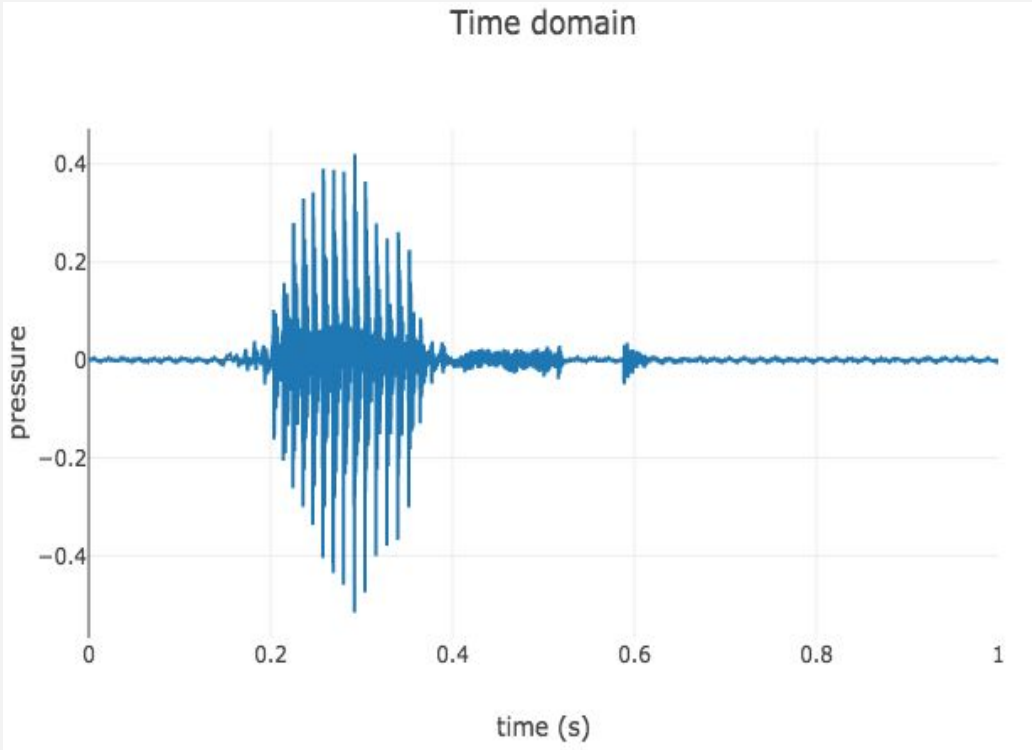
College of Engineering | Computer Science

# Goals

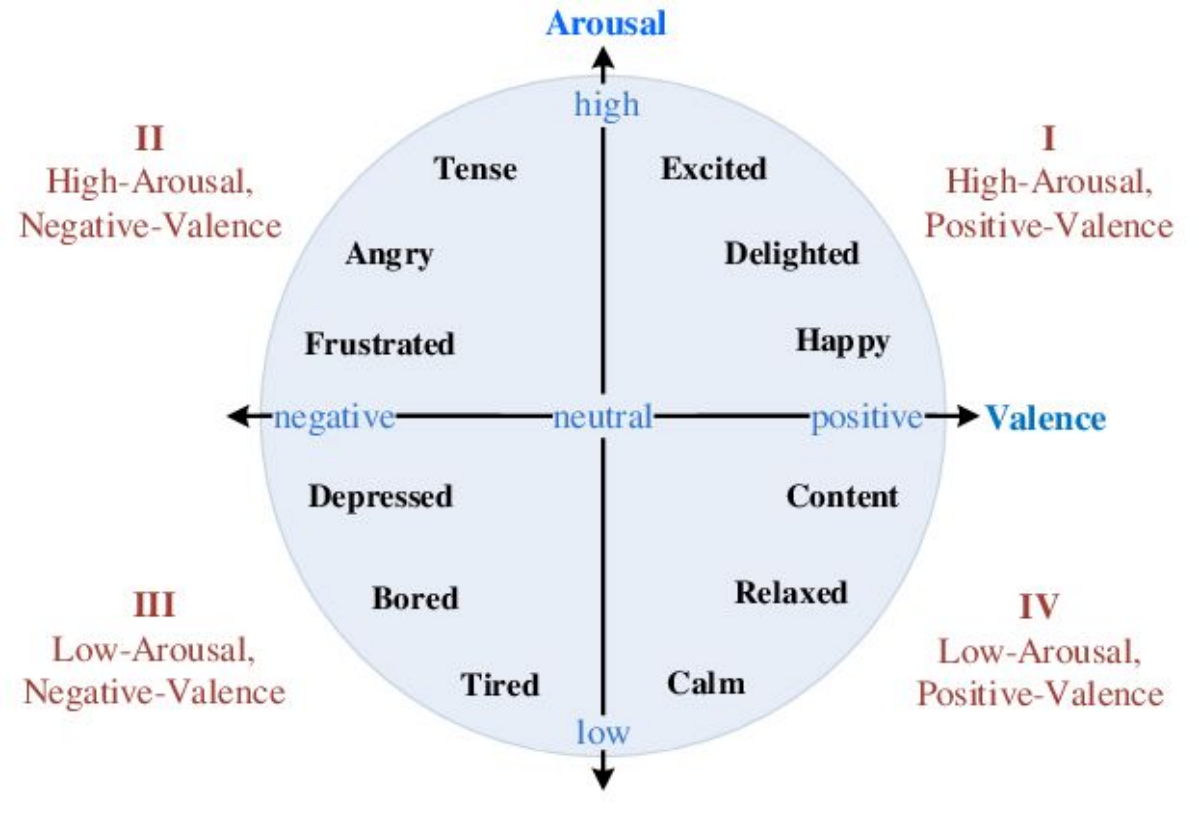
- Emotion prediction using raw audio

RHYTHM FEATURES.

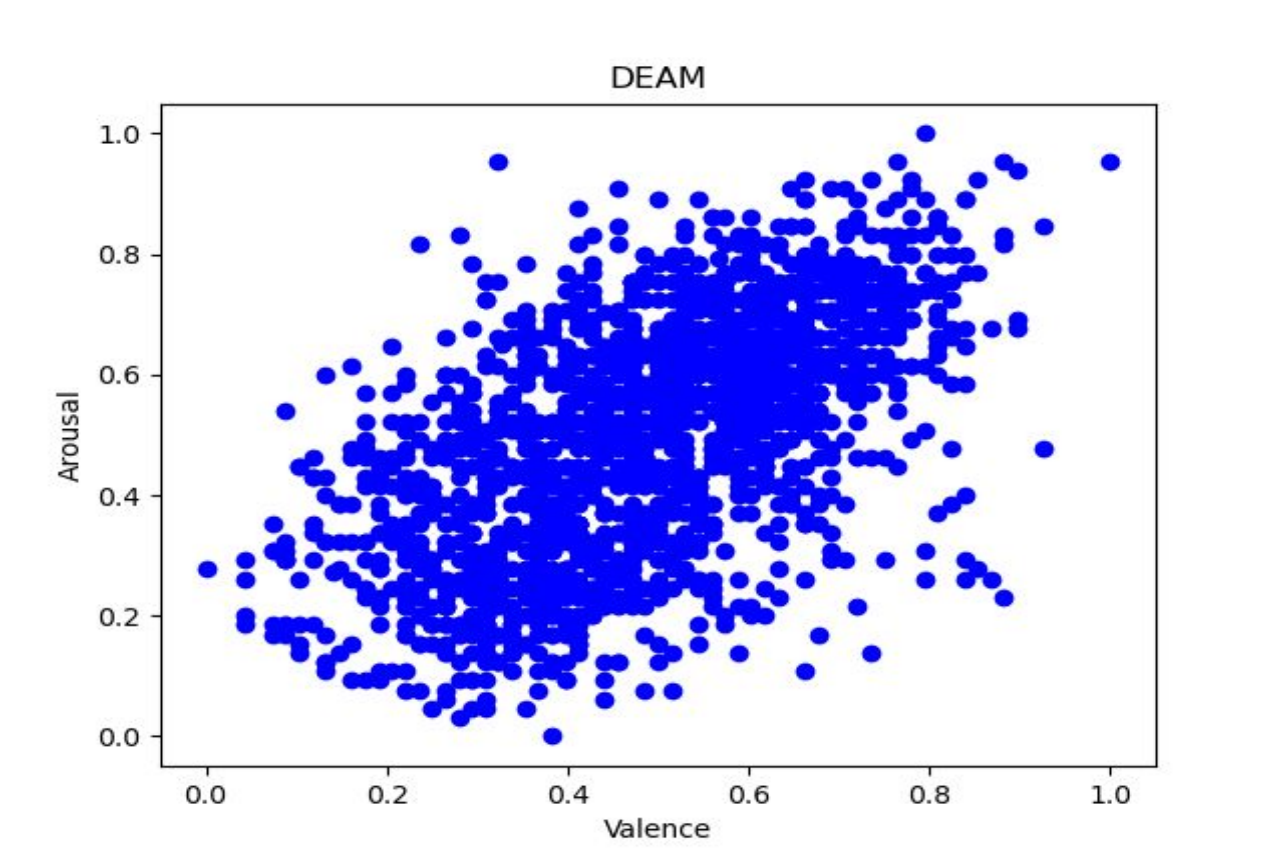
| ME | Feature | Available in |
|---|---|---|
| *Tempo* | Beat Spectrum | MIR TB |
| | Beat Location | Marsyas, Essentia |
| | Onset Time | MIR TB, Essentia |
| | Event Density | MIR TB |
| | Average Duration of Events | MIR TB |
| | Tempo | Marsyas, MIR TB, Essentia |
| | PLP Novelty Curves | Essentia |
| | HWPS | Marsyas |
| *Tempo and Note Values* | Metrical Structure | MIR TB |
| | Metrical Centroid and Strength | MIR TB |
| | Note Duration statistics | [5] |
| | Note Duration Distribution | [5] |
| | Ratios of Note Duration Transitions | [5] |
| *Rhythm Types* | Rhythmic Fluctuation | MIR TB |
| | Tempo Change | MIR TB |
| | Pulse / Rhythmic Clarity | MIR TB, Essentia |
| *Rests* | n.a. | n.a. |



# Valence Vs. Arousal



# DEAM Dataset - (Soleymani, 2018)

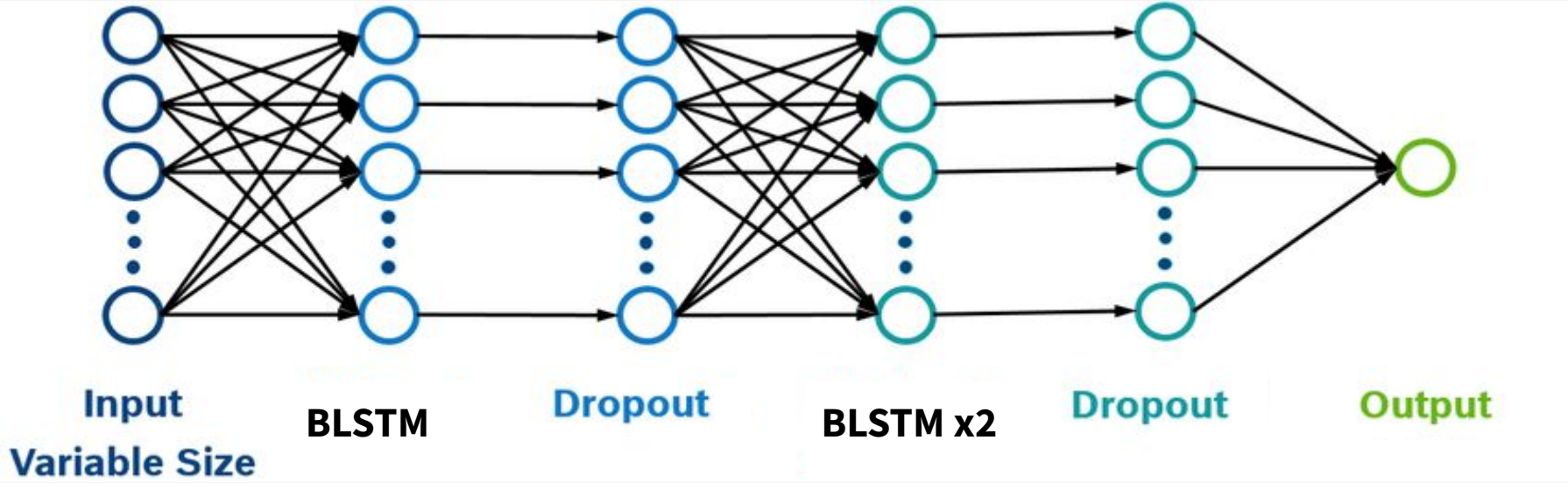


# Previous Work

- Music Information Retrieval Evaluation Exchange (MIREX) - (Panda, 2020)
  - 69.8% accuracy glass ceiling
  - 8000+ feature extraction
- Media Eval 2013-15 - (Aljanaki 2015)
  - DEAM dataset
  - Feature extraction
  - $R \approx 0.6$

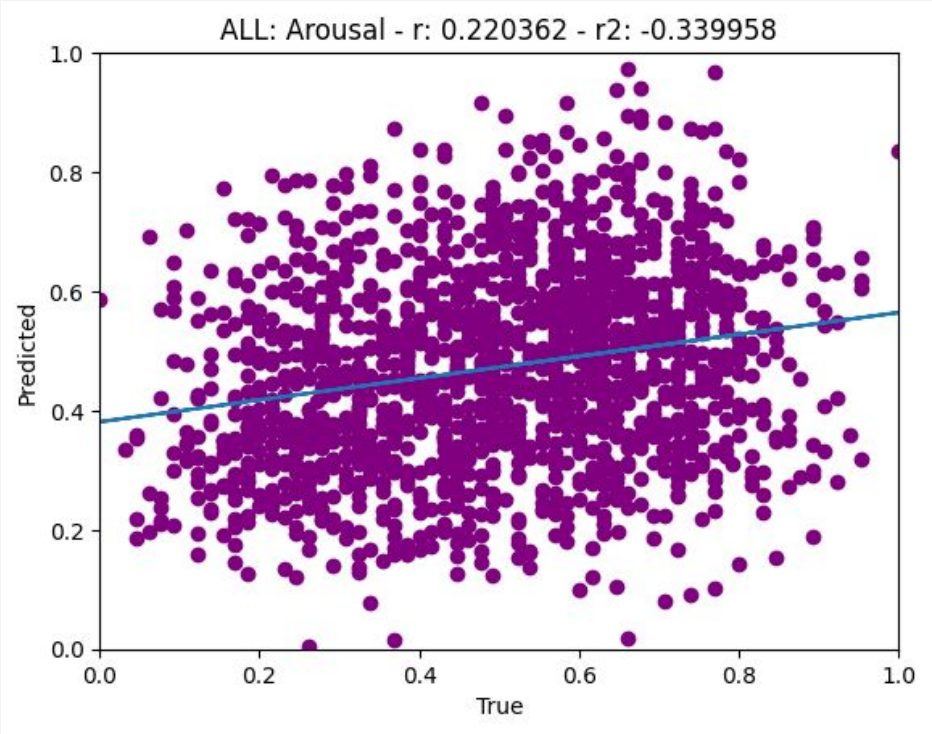
# Neural Network

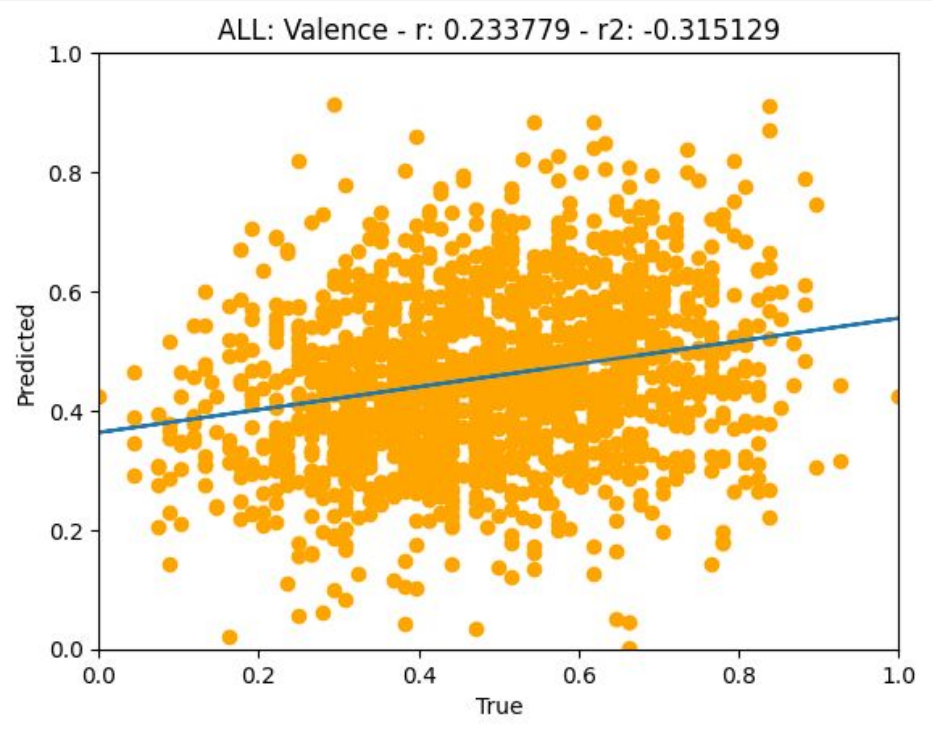
Oregon State University



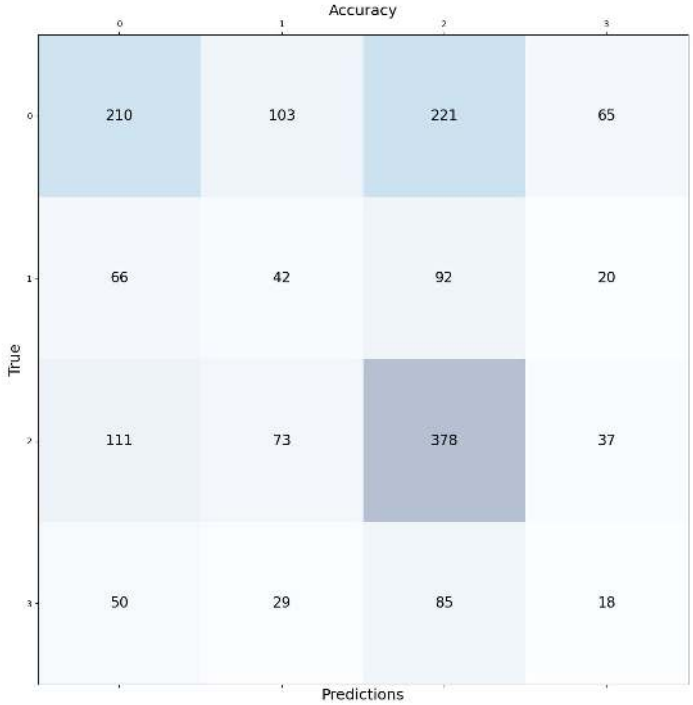
# Correlation

Oregon State University



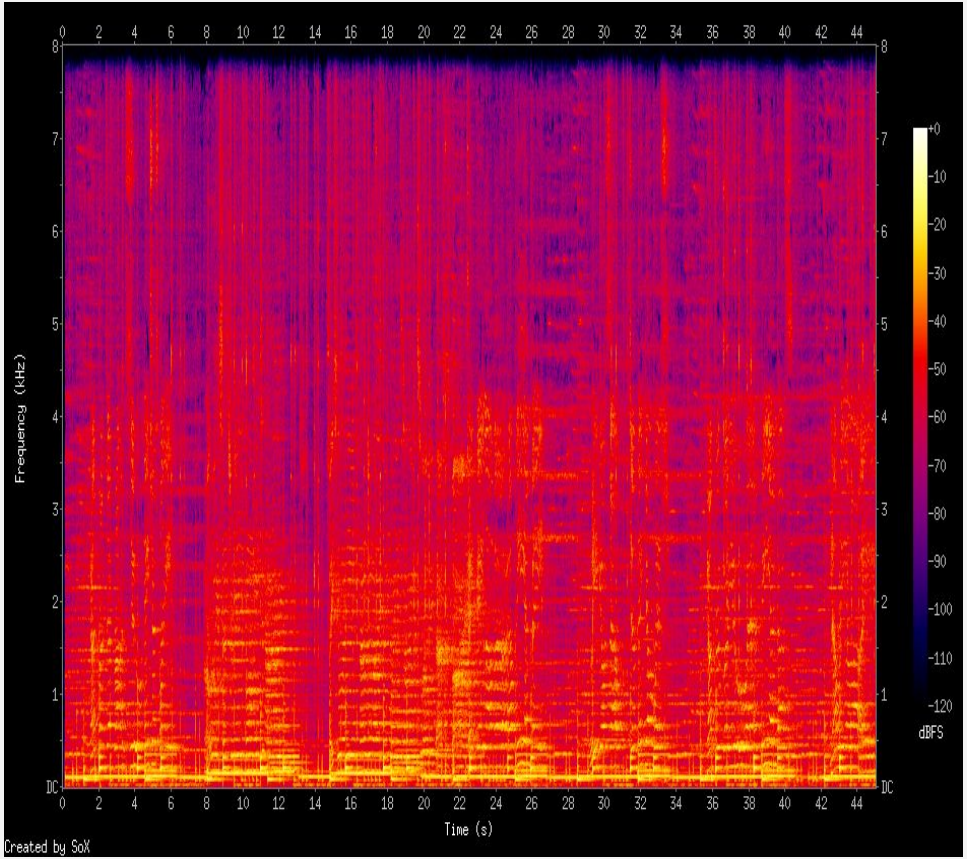



# Classified Accuracy



# Looking Forward

- CNN using spectrograms
- Using lyrics & feature extraction
- Expanding datasets
- Hopefully break glass ceiling



# References


- Soleymani, Mohammad, et al. “DEAM: MediaEval Database for Emotional Analysis in Music.” *DEAM*.
- Aljanaki, Anna, et al. “Emotion in Music Task at MediaEval 2015.” *MediaEval*, vol. 1436, 2015.
- Aljanaki, Anna, et al. “Developing a Benchmark for Emotional Analysis of Music.” *PLOS ONE*, vol. 12, no. 3, 2017, https://doi.org/10.1371/journal.pone.0173392.
- Hu, Xiao, and Stephen J. Downie. “THE 2007 MIREX AUDIO MOOD CLASSIFICATION TASK: LESSONS LEARNED.” *ISMIR*, 2008, pp. 462–467.
- “Mediaeval Benchmarking Initiative for Multimedia Evaluation.” *Emotion in Music*, http://www.multimediaeval.org/mediaeval2015/emotioninmusic2015/.
- Panda, Renato, et al. “Audio Features for Music Emotion Recognition: A Survey.” *IEEE Transactions on Affective Computing*, 2020, pp. 1–1., https://doi.org/10.1109/taffc.2020.3032373.




Oregon State University