

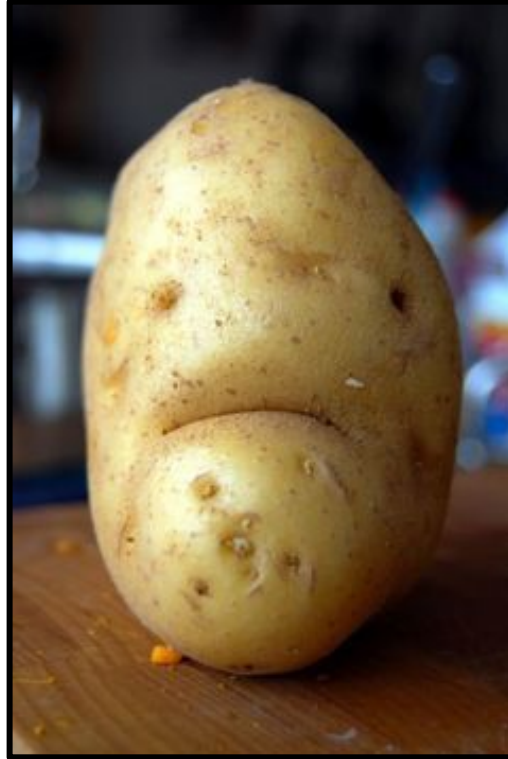
Affective Audio

Classifying audio speech files by emotional tone

Connor Eaton
Metis: Project McNulty

Emotional lens, emotional world

- Social animals
- Emotion shapes perception



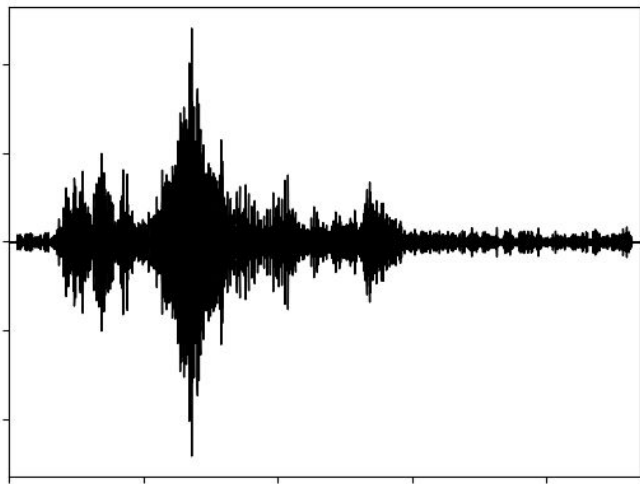
Applications of emotion analysis



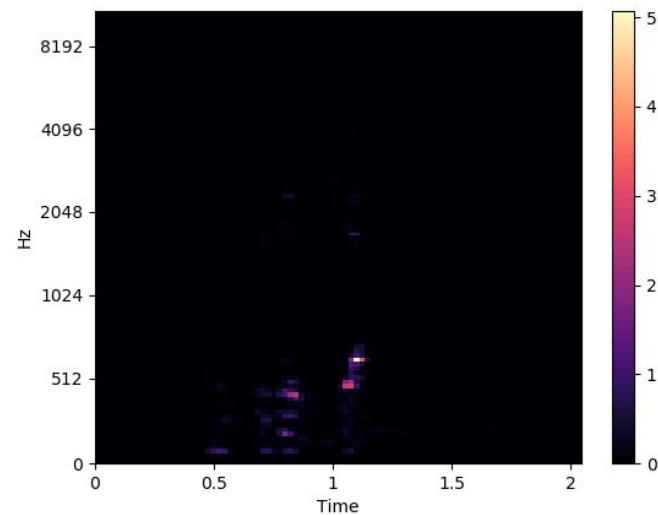
Emotional analysis

Text, **Audio**, Image, Video

Spectrum Analysis



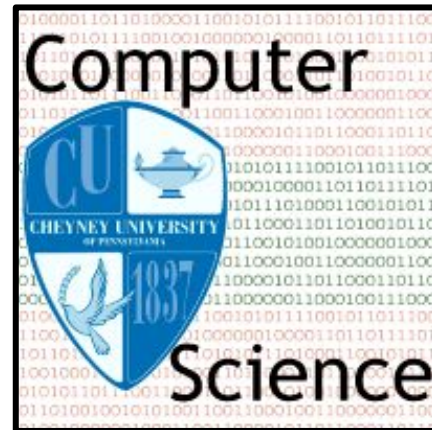
Chromagram Image Analysis



The data

Crowd Sourced Emotional Multimodal Actors Dataset

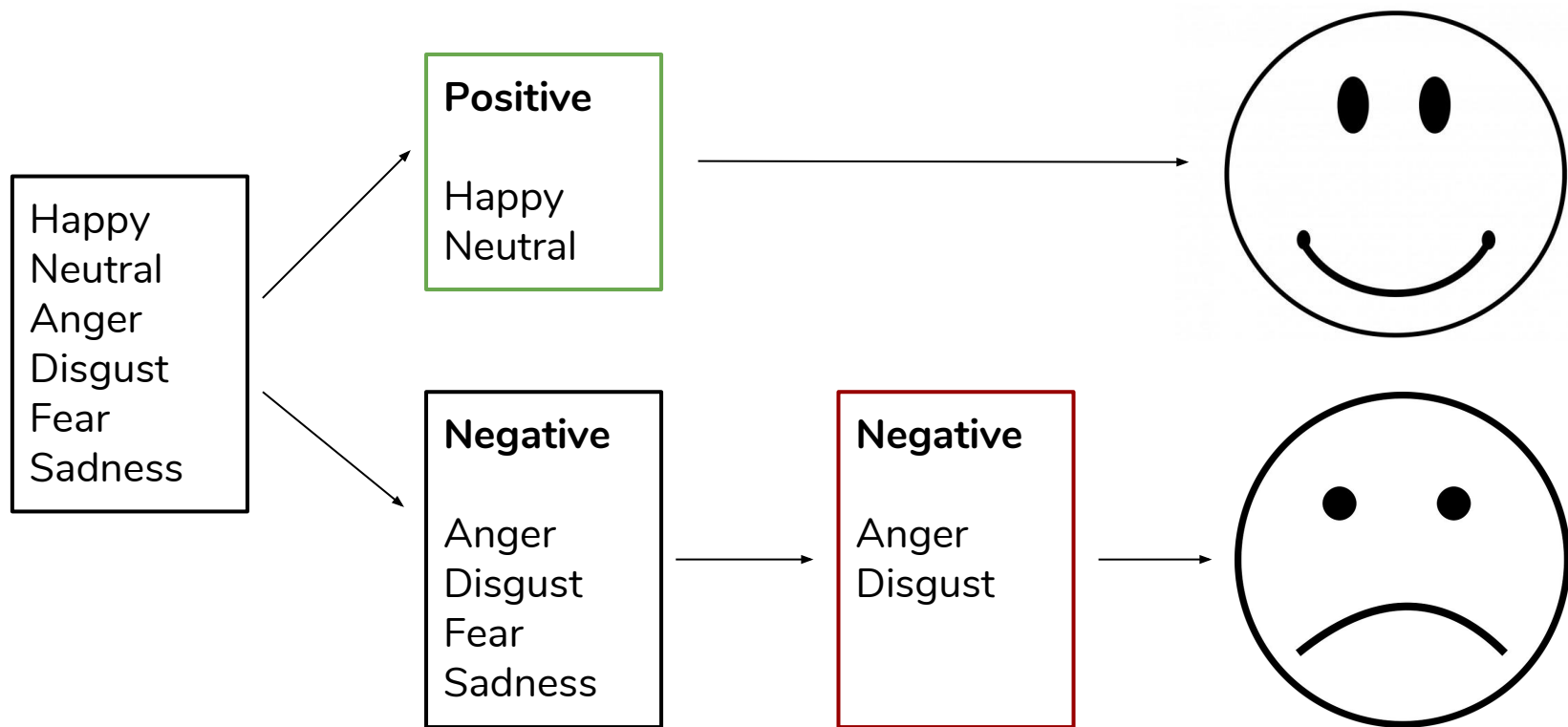
- ~7,500 recordings of actors
- 12 sentences
- 6 emotions



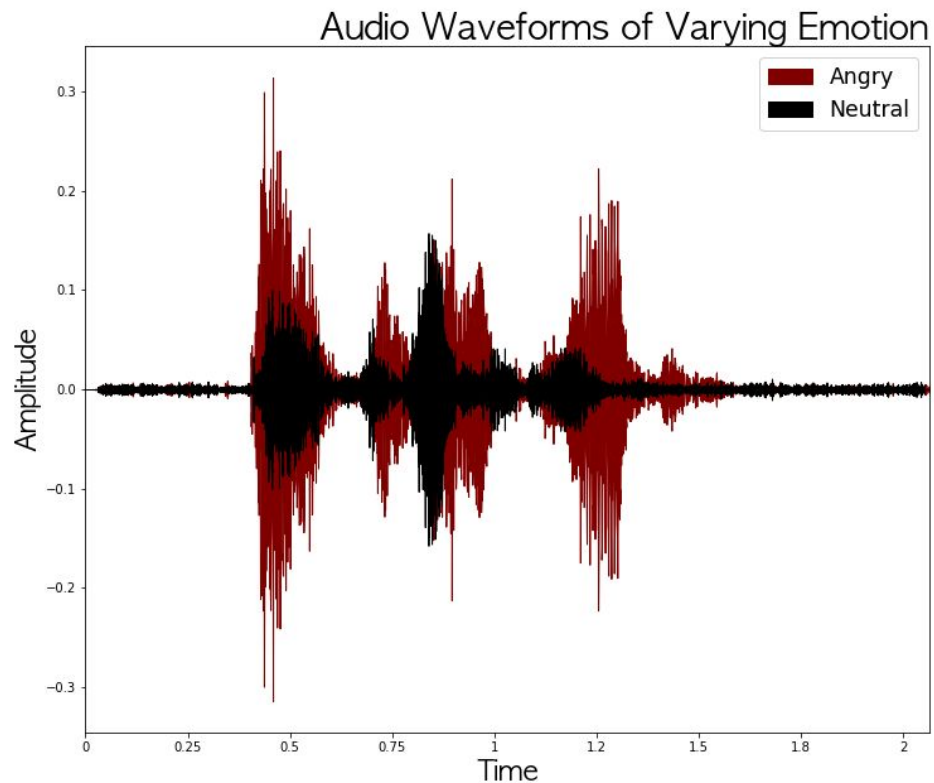
The features

- Librosa audio analysis library
- Energy, Chroma, MFCC, Flatness, etc.
- Computed mean and standard deviation
- Demographics

The target



Audio analysis



“Don’t forget a jacket.”

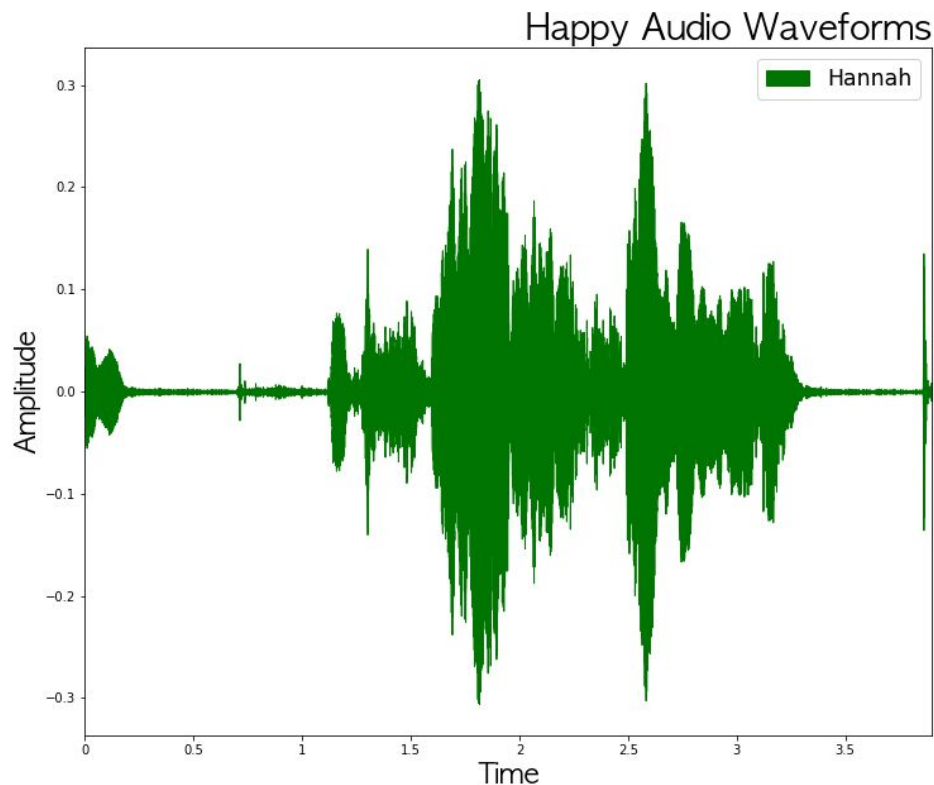
The model

- XGradient Boost Classifier
- GridsearchCV
- Trimmed to 8 spectral features

AUC Score	.91
f1	.81
Recall	.79
Precision	.83
Accuracy	.83

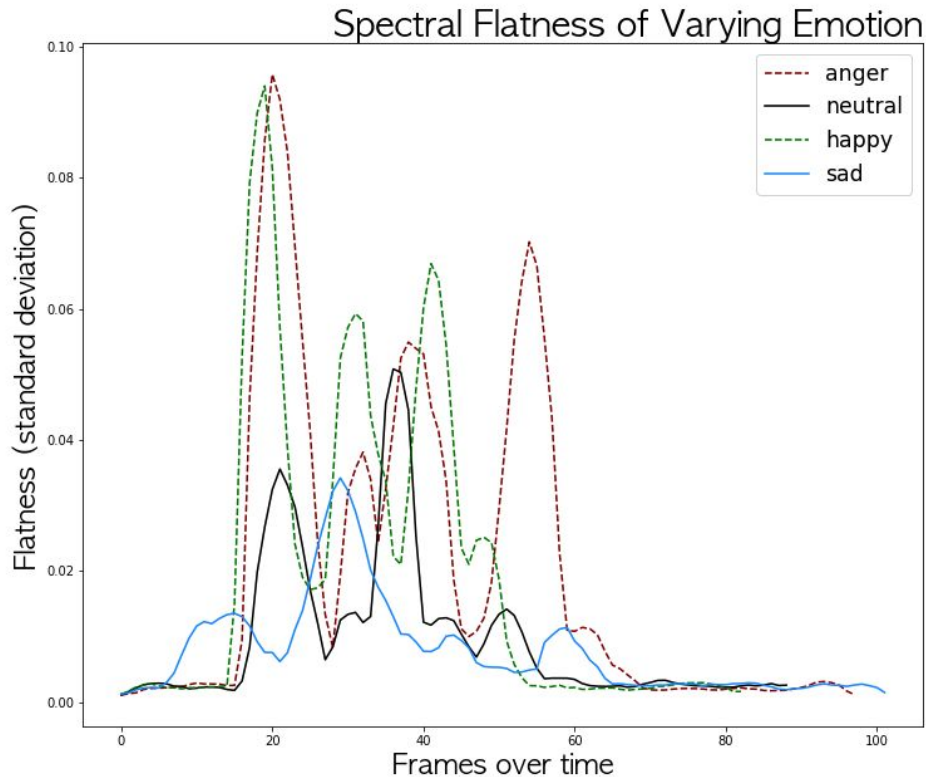
Testing

- 'It's snowing outside!'
- Predicted positive



Improvements

- Similarity between polar emotions
- Binary vs. Multiclass
- pyAudioAnalysis



Thank you

Appendix

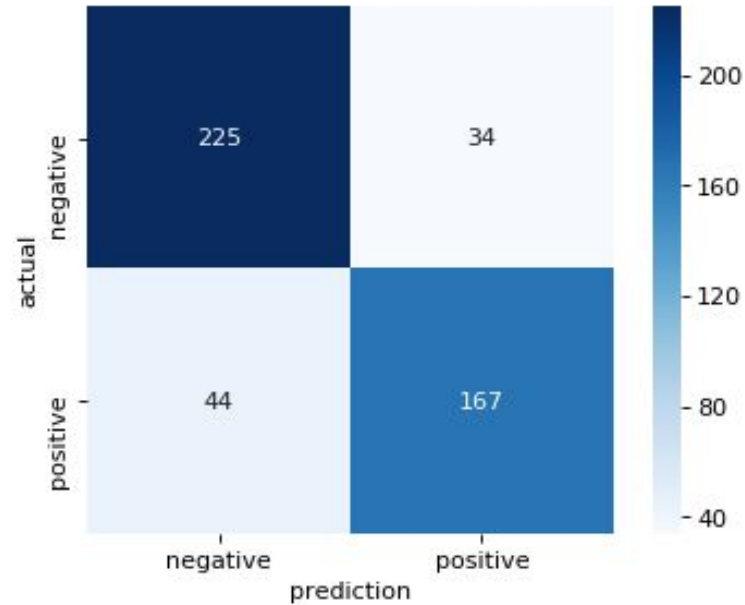
- Sadness

https://drive.google.com/file/d/1CHzY8FS-r2GM_yqaDWK2idqZEwOAJ0AH/view

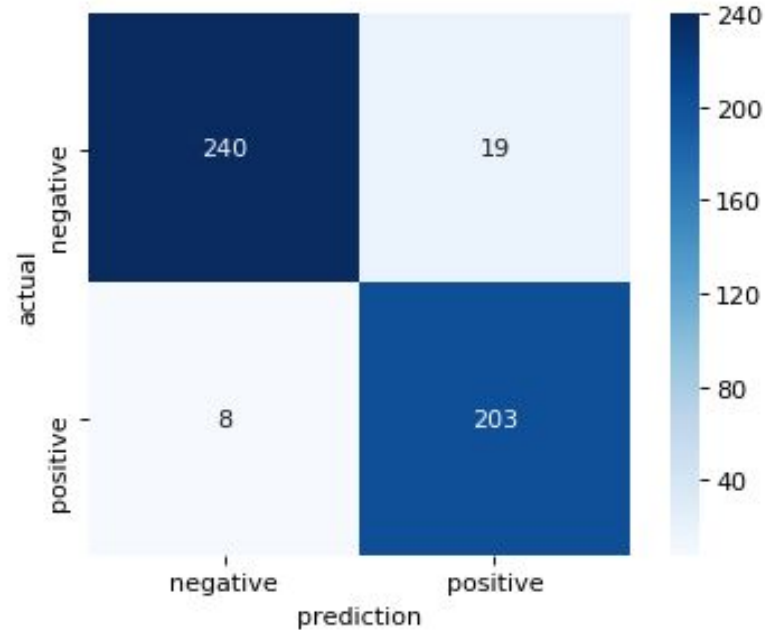
- Anger

<https://drive.google.com/file/d/1LczSTKM91toG0J7bP0ngHmwhoCzRSnKh/view>

Confusion matrix of Main Model

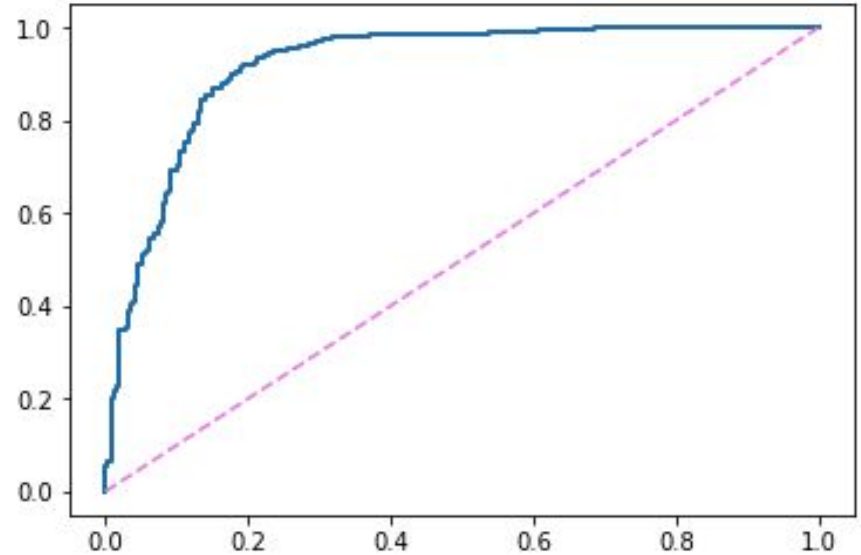


Confusion matrix of Anger vs. Neutral Model



Roc Curve and Performance of Main Model

AUC Score	.91
f1	.81
Recall	.79
Precision	.83
Accuracy	.83



ROC and performance of Anger vs. Neutral Model

AUC Score	.97
f1	.94
Recall	.96
Precision	.91
Accuracy	.94

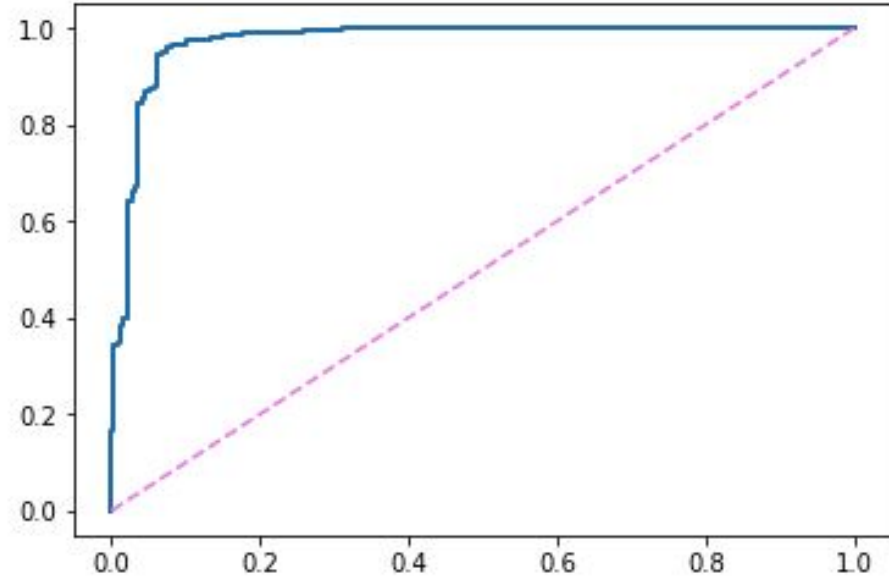


Image links

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<https://pythonawesome.com/python-audio-analysis-library-feature-extraction-and-applications/>