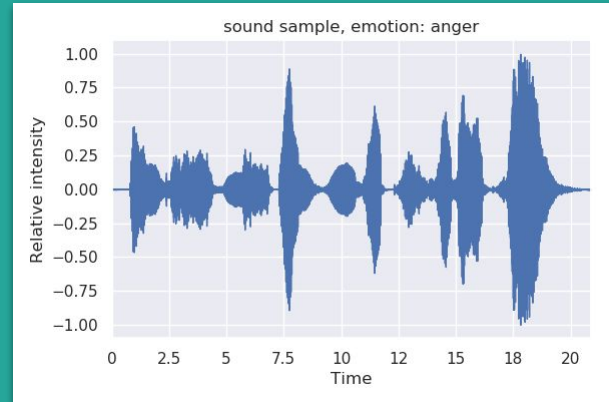
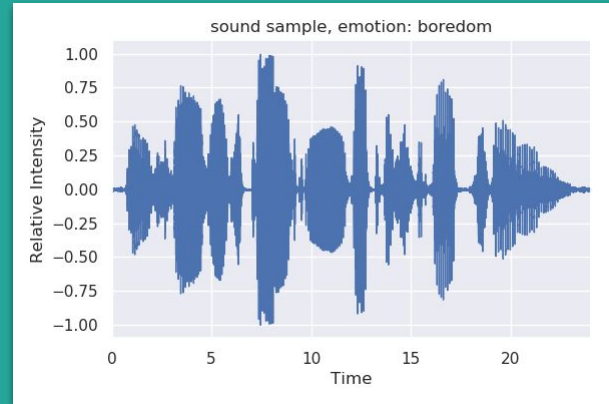


Speech emotion recognition

—

Charles Dufour

Given an audio recording, can we identify the emotion of the speaker ?



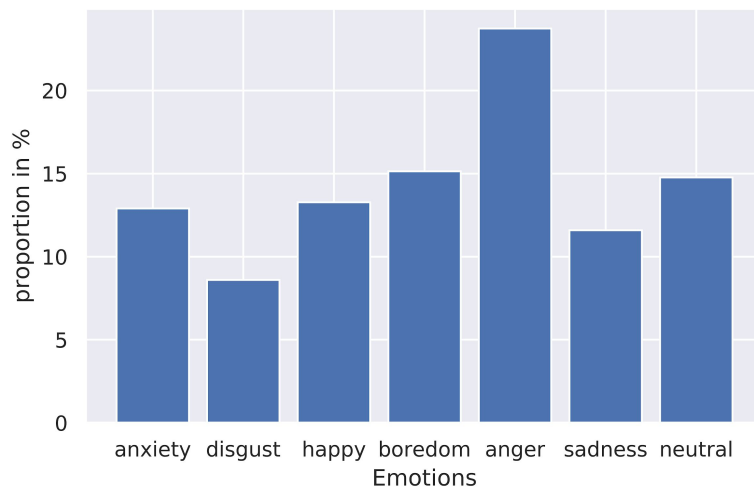
The Data

—

Source

Emo-DB

- Samples spoken by actors
- 535 audio files, 7 emotions
- Great quality



Building the features

1. Mel-frequency spectrum:

Mathematical representation of how the human ear perceives the sound.

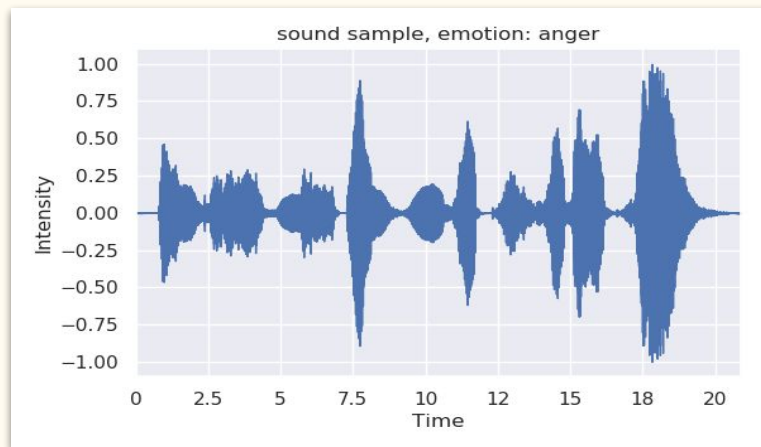
2. Spectral components (filters, steepness changes,...)

Only report statistics of these components (mean, standard deviation, minimum, maximum,...)

3. Ratio spoken time vs unspoken time

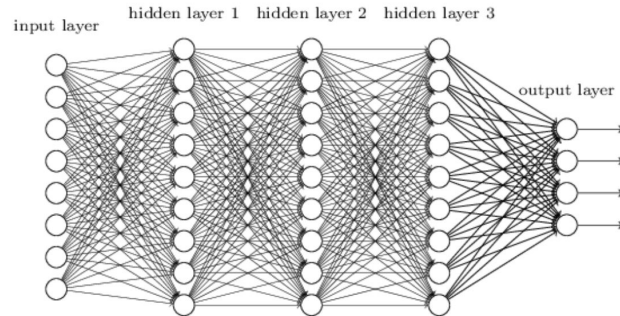
Libraries used:

Librosa, python_speech_features, ...



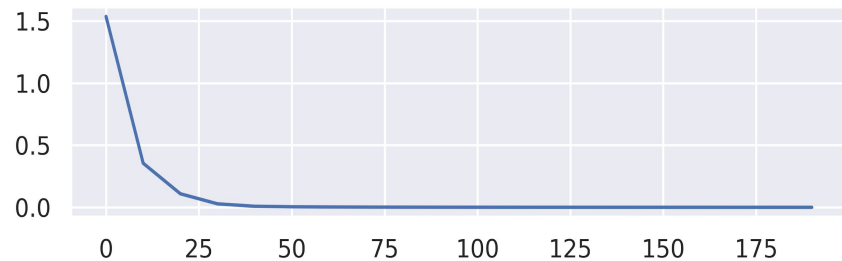
Model

Fully connected neural network with 4 hidden layers and Relu activation

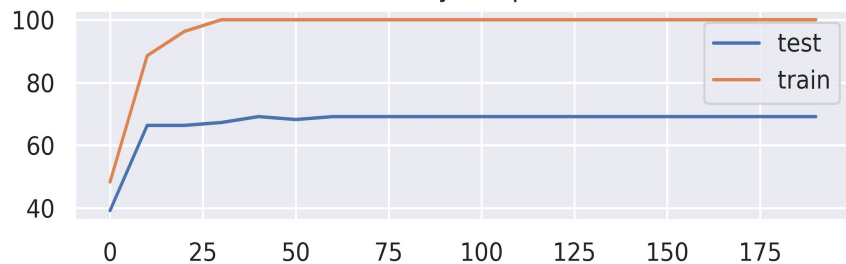


Results

training loss vs epochs

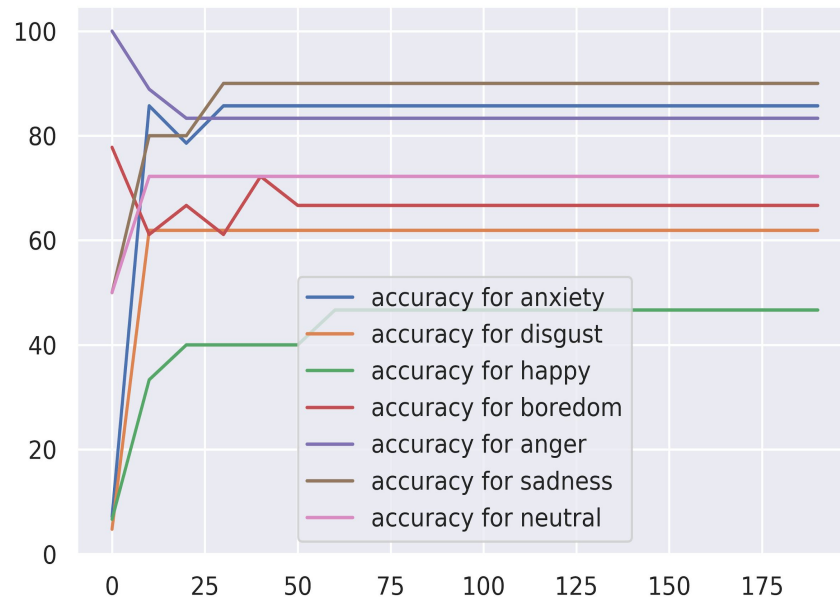


accuracy vs epochs



global accuracy vs epochs

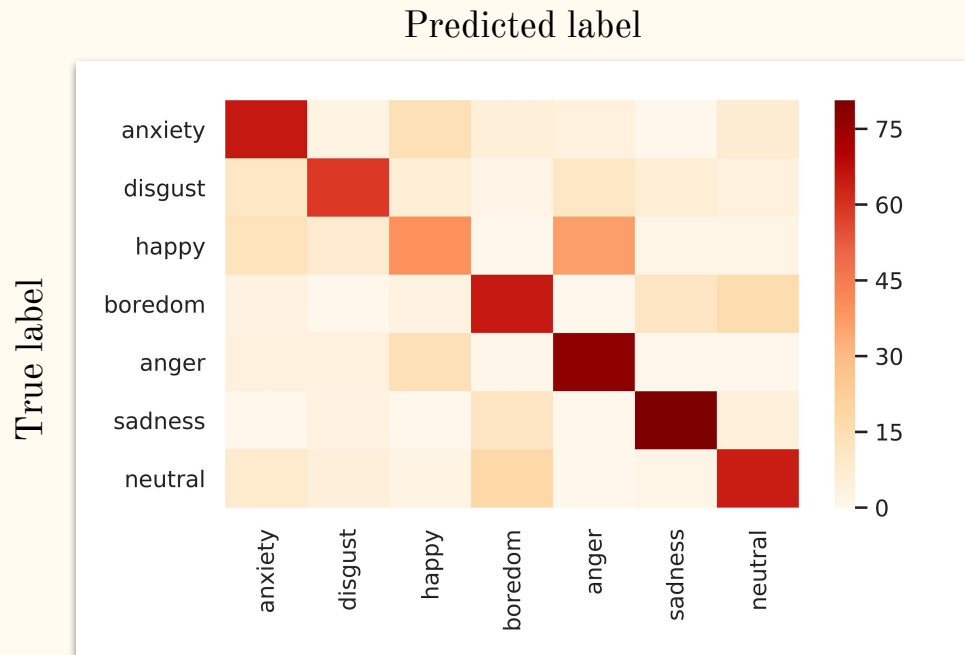
accuracy per class vs epochs



Accuracy
Obtained with 5-fold CV

global	anxiety	disgust	happy	boredom	anger	sadness	neutral
65.79%	68.25%	65.45%	45.61%	67.14%	77.39%	82.37%	66.53%

Confusion matrix (in %)



Sources

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- Hastie, T.; Tibshirani, R. & Friedman, J. (2001), *The Elements of Statistical Learning*, Springer New York Inc., New York, NY, USA.