

Course project

"Gender classification by voice"

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Male or Female?

- Authors had raw audio files
- They preprocessed them with R package warbleR, got 20 features
- Used MLP network, got accuracy 0.967
- They also described results of other ML algorithms, referring to other papers

Dataset from the article

- Ready csv file with 20 features

Dataset LibriSpeech: audiobooks

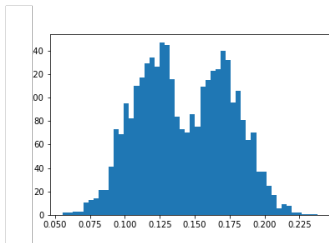
- Raw audio files with 'clean' speech (flac format)
- Our implementation of feature extraction

Dataset with records from TED Talk

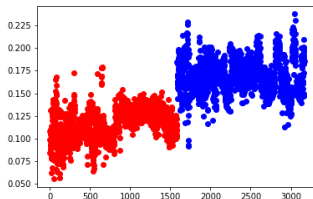
- Raw audio files with noise (sph format)
- Extracting features with warbleR (R package) and with our approach of feature extraction

- 20 features
- Different statistics from Fast Fourier Transform
- Dominant frequency
- Fundamental frequency:
 Different rates for male(lower) and female(higher)

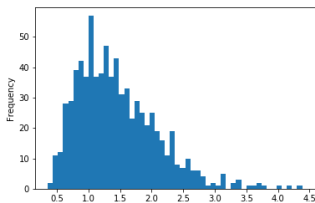
Vizualization, mean fundamental freq - the most important



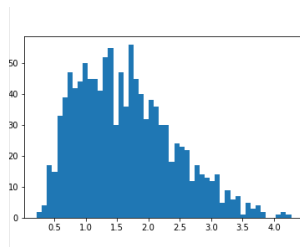
a) Their data



b) Their data, R package



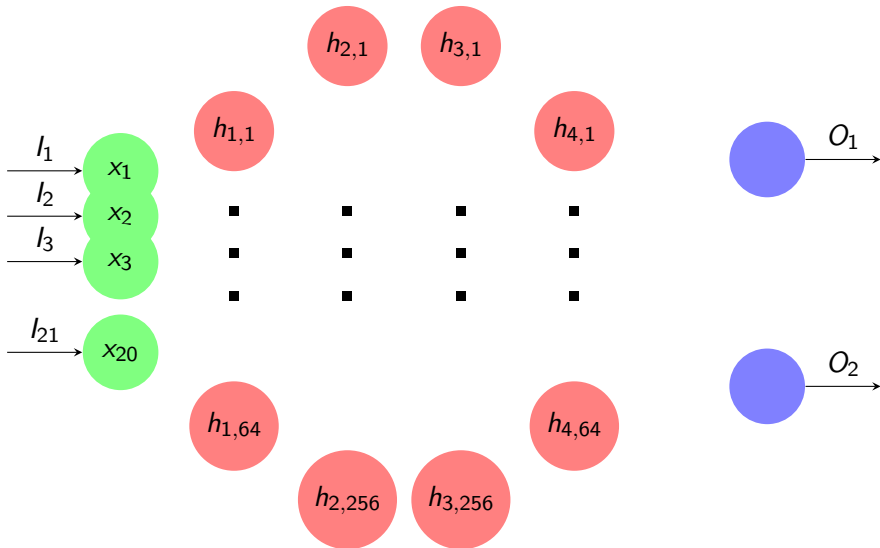
c) TED, R package



d) Audiobooks, our feature extraction

Multilayer perception networks(article)

Learning rate = 0.001, 150 epochs



Results with MLP network from the article

Dataset from article

Score in the article 0.967

Score we obtained 0.969

Audiobooks dataset(clean)

Score we obtained 0.826

TED-talk dataset(noise)

Score we obtained 0.813

Method	Their data	Our data	Ted+our app.	Ted+R
Boosting	0.976	0.871	0.832	0.713
RF	0.978	0.840	0.745	0.687
SVM	0.718	0.800	0.814	0.814
Stacked model	0.718	0.860	0.846	0.809
MLP	0.969	0.826	0.813	0.733

Conclusions

- Results of the article is the same, as authors stated
- Other network we tried worked worse, then their MLP
- HOWEVER, Xgboost, RF worked BETTER then MLP suggested by authors
- MLP used for another dataset gives lower results, so this network suits well only for their data

What was done?

- 4 datasets, R-package feature extraction, our implementation of feature extraction, compared results
- Replicated results of the article
- Improved results of the article with other ML methods