

Personality Analysis using Random Forest Regression

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1 Team details

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2 Contribution details

- Personality Analysis using Random Forest Regression
- Final score
- General method description
- References:
- Representative image / diagram of the method
- Describe data preprocessing techniques applied (if any)

3 Personality Trait recognition from Audio data

We use the speech features toolbox of the Human Dynamics Group at MIT Media Lab obtained from <http://groupmedia.media.mit.edu/data.php>. The features are used with a decision forest regression approach to perform predictions.

3.1 Features / Data representation

We use the speech features of the Human Dynamics Group at MIT Media Lab obtained from <http://groupmedia.media.mit.edu/data.php>. The features extracted are the chunk features described below.

1. formant frequency (hz)
2. confidence in formant frequency
3. spectral entropy
4. value of largest autocorrelation peak
5. location of largest autocorrelation peak
6. number of autocorelation peaks
7. energy in frame
8. time derivative of energy in frame

The mean and std values for the features described above are calculated from each video sample. For the features described below, a single feature is obtained.

1. average length of voiced segment (seconds)
2. average length of speaking segment (seconds)
3. fraction of time speaking
4. voicing rate: number of voiced regions per second speaking
5. fraction speaking over: fraction of time that you & any other speaker are speaking.

3.2 Learning strategy

A 1000 tree random forest regression approach has been applied using the audio features obtained above. Parameter optimization was performed using a 10-fold cross-validation on the training set and best parameters were directly applied to the test set.

3.3 Method complexity

Complexity of the learning method is $O(\text{ntree} * d * n)$ where ntree is the number of trees, d is the maximum tree depth and n is the number of training samples. The complexity of the feature extraction method is unclear as we used a library for it.

4 Multimodal Personality Trait recognition

4.1 Global Method Description

- Total method complexity: Feature extraction complexity plus $O(\text{ntree} * d * n)$
- Which pre-trained or external methods have been used: We use the speech features toolbox of the Human Dynamics Group at MIT Media Lab obtained from <http://groupmedia.media.mit.edu/data.php> for feature extraction. Matlabs treebagger algorithm for classification.
- Qualitative advantages: Easy to implement using easy to obtain tools.
- Novelty degree of the solution and if it has been previously published: N/A.

5 Other details

- Language and implementation details Matlab r2016a, Windows 2010SP1, 32GB memory, Used parallelization of matlab for faster training.
- Effort spent for development: 2 man spent 2 days.
- Training/testing expended time: 1 minute.
- General comments and impressions of the challenge? what do you expect from a new challenge in face and looking at people analysis?: We decided to join this challenge but only found the chance to get to work on it 2 days prior to the submission deadline. We were astonished by how well such a simple method as ours performed on the training set so we decided to try our luck with the final submission. We are planning to complete the implementation of our full suite with lots of additional visual features and extensive testing to the second part of the challenge in ICPR.