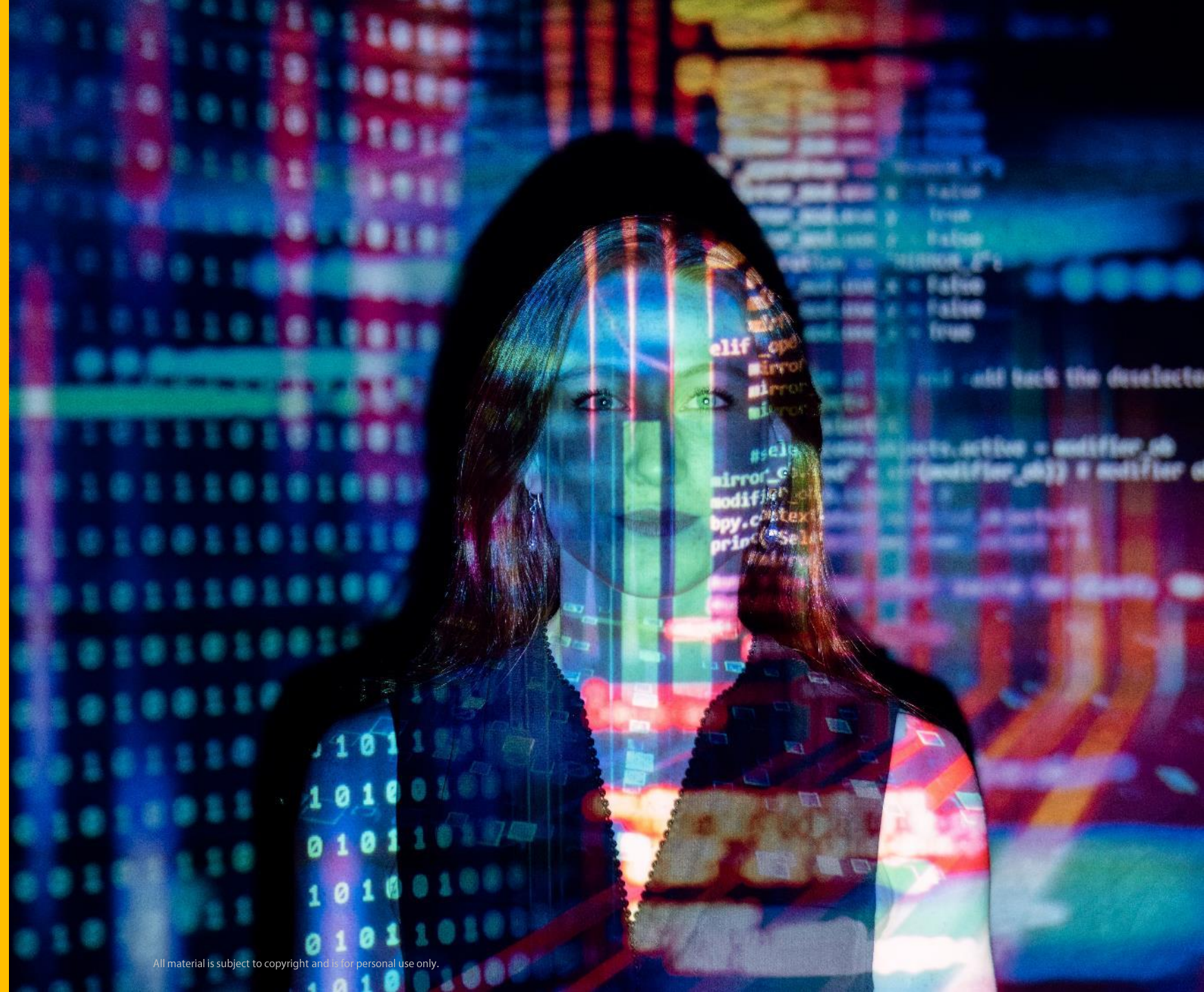


Personality Predictions from Automated Video Interviews: Explainable or Unexplainable Models?

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What are automated video interviews?

Hire★Vue



pymetrics

AON

 retorio


YOBS

What are automated video interviews?

Just A 90
Second
Zoom Call
Generates
Up To An
18-Page
Talent
Report



Data collection

Example questions

- **Conscientiousness**
- “Tell me about a time you had a month or more to prepare for an important presentation, research project, or difficult task. Please describe the situation, how you prepared for it, and the outcome.”
- **Agreeableness**
- “Tell me about a time a close friend or coworker reached out for help while you were busy working on your own important task. Please describe the situation, how you responded and the outcome.”

Sample

694 participants

Personality measure: 44-item Big Five Inventory

7 video interview questions recorded using HireVue’s automated video interview platform

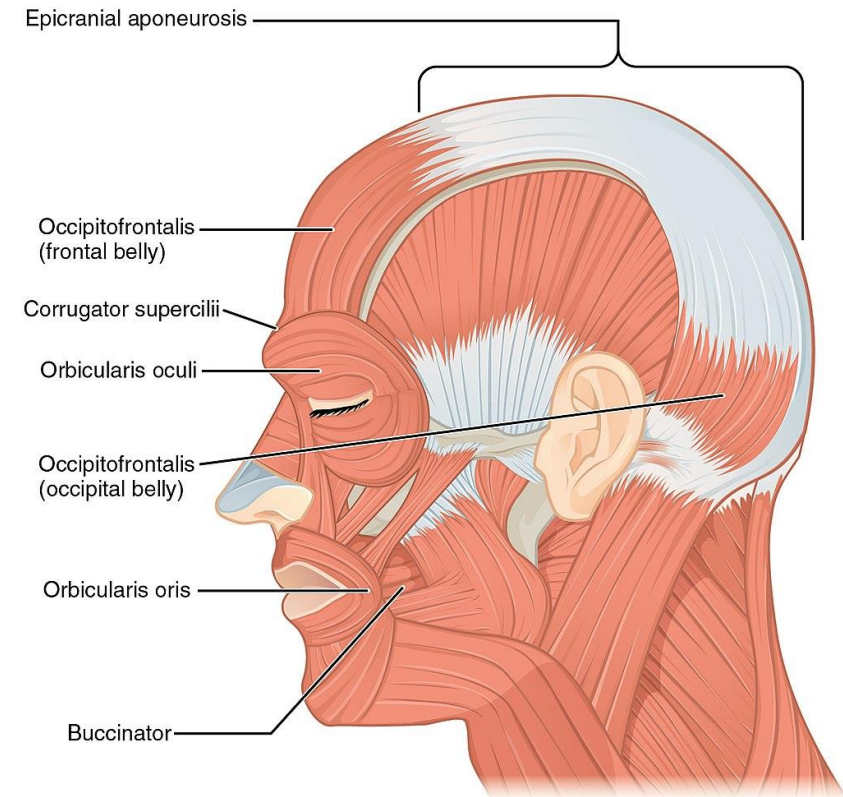
Average interview length 17 minutes 11 seconds. 200 hours of video analysed.

Video features extracted

We automatically extract 1,710 features per video interview

- **Language-based**
 - Interviews automatically transcribed
 - Theory-driven word lists including LIWC, NLTK and General Inquirer
 - BERT (Bidirectional Encoder Representations from Transformer), a natural language processing pre-training algorithm.
- **Audio**
 - 50 spectral audio characteristics including rate of speech, pitch, intonation, range, gaps in speech, repetition of speech.

- **Facial expressions**
 - Labelled by Affectiva, based on the Facial Action Coding System, identifying 63 facial action units.



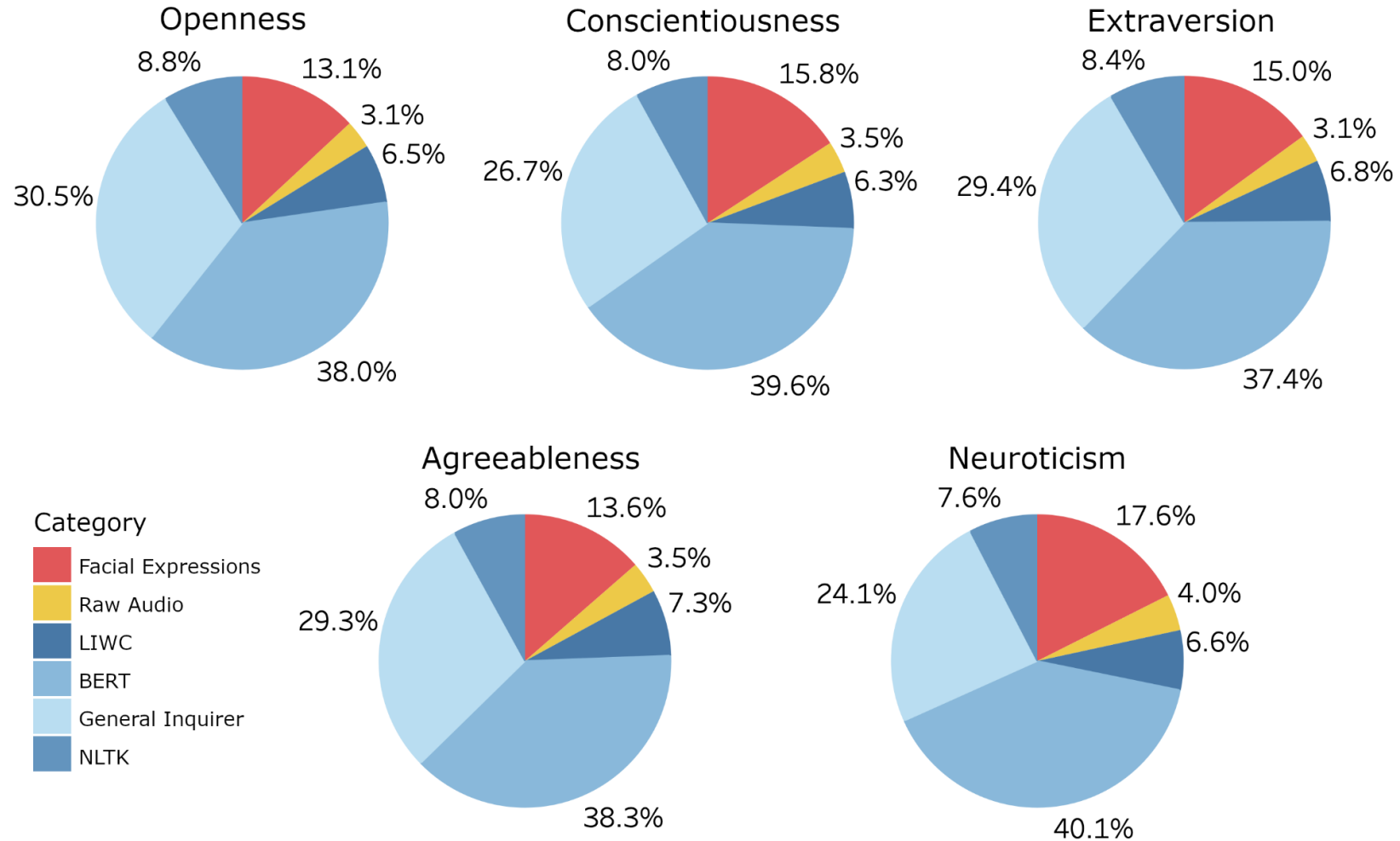
ML models' accuracy

All models use 10-fold cross-validation

Model	O	C	E	A	N	Mean r
Ridge	0.281	0.249	0.242	0.199	0.135	0.221
Lasso	0.264	0.200	0.182	0.200	0.066	0.182
Elastic Net	0.262	0.200	0.181	0.204	-0.020	0.165
Random Forest	0.264	0.234	0.212	0.188	0.145	0.209
Neural Network	0.204	0.115	0.125	0.167	0.150	0.152

Feature importance

For ridge regression models



Explainable personality prediction model

We narrow it down from 1,710 features to 653

- Same data as previous study.
- Only features that are explainable are kept
- **Language**
- All BERT features removed. This excludes 768 features.
- **Audio and facial**
- Features related to measurement of variance removed, e.g. standard deviation of smiling.
- In total 53 audio features and 232 facial expression features were removed.

Explainable ridge vs ML ridge accuracy

All models use 10-fold cross-validation

Model	O	C	E	A	N	Mean r
Explainable Ridge	0.240	0.185	0.184	0.170	-0.009	0.154
ML Ridge	0.281	0.249	0.242	0.199	0.135	0.221

Conclusions and future work

Key takeaways

- **Big Five personality can be predicted from video interviews with a mean accuracy of $r=.221$**
- This is comparable to humans watching video interviews who had accuracy $r=.23$ (Hickman *et al.*, 2021), and face-to-face interviews intended to assess personality $r=.28$ (Barrick *et al.*, 2000). Work colleagues also only predict each other's personality at $r=.27$ (Connelley & Ones, 2010)
- **Our explainable model is less accurate at $r=.154$**
- But it has the advantage of being explainable which might be key for high stakes interviews.
- **The most important features are the words that the interviewee says**
- Not the way that they say it, or their facial expression at the time. This is good news for practice.

Open questions

- Are the algorithms biased? And how biased are they compared to humans doing the same task?
- Are the automated personality predictions a good predictor of work behaviour and job success?
- Can prediction accuracy be increased by combining features? E.g. if the interviewee smiles while saying a certain word.

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