

AI researchers study gaze and personality links outside the lab

May 6 2018, by Nancy Owano



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The journal *Frontiers in Human Neuroscience* have published a paper about how artificial intelligence can help predict your personality from your eye movements.

The paper is [online](#). Sabrina Hoppe, Tobias Loetscher, Stephanie Morey and Andreas Bulling are the authors and their affiliations are University of Stuttgart, University of South Australia, Flinders University, and the Max Planck Institute for Informatics. Their fields of specialty range from robotics to psychology to perceptual user interfaces.

The title says it all: "Eye Movements During Everyday Behavior Predict Personality Traits." Notice their use of the word "Everyday" because this is important. Their exploration is not labs-based but in the real world. (Studies restricted to laboratory conditions is an approach that may not lead to valid theories of human behavior in natural settings.)

How did they conduct their study? They tracked the eye movements of 42 participants as they ran an errand on a university campus. They had to wear an off-the-shelf head-mounted eye tracker on their errands, said *Digital Trends*.

The participants were instructed to walk around campus and to purchase any items of their choice such as a drink or confectionary from a campus shop of their choice.

Upon return, the tracking was stopped and the glasses removed. Participants were then asked to fill in the personality and curiosity questionnaires.

The authors assessed their personality traits based on the questionnaires. "With both the input (the eye data) and output (personality types) gathered, the AI was then able to work out the [correlating](#) factors linking the two," said Luke Dormehl in *Digital Trends*.

Results: They were able to predict a number of traits as well as perceptual curiosity only from eye movements.

Newsweek said, "people with similar traits tend to move their eyes in similar ways. For example, optimists spend less time looking at negative emotional stimuli, like images of cancer, while [curious](#) people tend to take in all regions of a scene."

That is an interesting observation generally but in this study the researchers focused on such observations via an artificial intelligence system. The AI system was unleashed to work out the correlations between personality traits and [eye movements](#).

The technology involved (1) a machine learning method and (2) a set of features encoding different eye movement characteristics. The team said "thanks to the machine learning approach, we could automatically analyze a large set of eye movement characteristics and rank them by their importance for personality trait prediction."

"The proposed machine learning approach was particularly successful in predicting levels of agreeableness, conscientiousness, extraversion, and perceptual curiosity. It therefore corroborates previous laboratory-based studies that have shown a link between personality traits and [movement](#) characteristics."

Why the study matters: "While predictions are not yet accurate enough for practical applications, they are clearly above chance level and outperform several baselines," said the authors. The authors stated that the prediction accuracy and reliability scores obtained from 42 participants were "very promising."

The number of participants was small but in future more data could serve to support greater accuracy. Aristos Georgiou in *Newsweek*: "At present, their technique is only 7 to 15 percent better than chance at predicting these [personality traits](#), but the scientists note that they only had data from 42 people. As the algorithm receives more eye-tracking

data, its predictions will become increasingly accurate, they say."

Larger datasets were noted as a goal for future research— that is, obtaining larger datasets with a more representative sample of the general population than the convenience sample of the current study.

AI as a mechanism for [personality](#) assignments can be abused in the wrong hands with ethical issues thrown in question are potential ethical dilemmas involved. Dormehl in *Digital Trends* said Andreas Bulling, one of the study team, noted plenty of positive applications, too. Bulling is a professor from the Max Planck Institute for Informatics in Germany.

"Robots and computers are currently socially ignorant and don't adapt to the person's non-verbal signals," Bulling said. "When we talk, we see and react if the other person looks confused, angry, disinterested, distracted, and so on. Interactions with robots and computers will become more natural and efficacious if they were to adapt their interactions based on a person's non-verbal signals."

More information: Sabrina Hoppe et al. Eye Movements During Everyday Behavior Predict Personality Traits, *Frontiers in Human Neuroscience* (2018). [DOI: 10.3389/fnhum.2018.00105](https://doi.org/10.3389/fnhum.2018.00105)

Abstract

Besides allowing us to perceive our surroundings, eye movements are also a window into our mind and a rich source of information on who we are, how we feel, and what we do. Here we show that eye movements during an everyday task predict aspects of our personality. We tracked eye movements of 42 participants while they ran an errand on a university campus and subsequently assessed their personality traits using well-established questionnaires. Using a state-of-the-art machine learning method and a rich set of features encoding different eye movement characteristics, we were able to reliably predict four of the

Big Five personality traits (neuroticism, extraversion, agreeableness, conscientiousness) as well as perceptual curiosity only from eye movements. Further analysis revealed new relations between previously neglected eye movement characteristics and personality. Our findings demonstrate a considerable influence of personality on everyday eye movement control, thereby complementing earlier studies in laboratory settings. Improving automatic recognition and interpretation of human social signals is an important endeavor, enabling innovative design of human–computer systems capable of sensing spontaneous natural user behavior to facilitate efficient interaction and personalization.

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