

Title

Machine Learning for the Quantified Self

Name and affiliation of presenter

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Abstract

Self tracking has become part of a modern lifestyle; wearables and smartphones support self tracking in an easy fashion and change our health behavior. The amount of data generated by these devices is so overwhelming that it is hard to get useful insights from it. Luckily, techniques exist from the domain of artificial intelligence that can help out here: machine learning approaches are well suited to assist and enable one to get the most out of all the data being collected. While there are tutorials that explain machine learning techniques, self-tracking data comes with its own difficulties that require dedicated techniques such as learning over time series and learning across users. In this tutorial, we will explain the complete loop to effectively collect and use self-tracking data for machine learning, going from collecting data, cleaning the data, the identification of features, finding clusters in the data, the application algorithms to create predictions of values for the present and future, and learning how to provide feedback to users based on their tracking data. All concepts we explain draw from state-of-the-art scientific literature. To illustrate all approaches we use a running case study of a rich self-tracking dataset obtain via the crowdsignals platform which the participants can also work on after having followed the tutorial. While the tutorial revolves around self-tracking data, the techniques explained are more widely applicable to sensory data in general, making it useful for a wider audience as well.

The audience will:

- learn dedicated machine learning techniques that are tailored towards sensory data
- learn how to apply these machine learning techniques effectively
- explore a real life case study for the quantified self

Outline

- Introduction (basic definitions, overview, etc.)
- Collecting data
- Cleaning the data
- Engineering features
- Application of clustering and predictive modeling techniques
- Personalizing feedback

Intended audience (include level of expertise)

Graduate students and scholars with some basic knowledge of machine learning who are interested in the specifics of working with sensory data and personalized (health) applications.

Biography of presenter

Mark Hoogendoorn is an Assistant Professor in the Computational Intelligence Group at the Department of Computer Science of the Vrije Universiteit Amsterdam. He obtained his PhD degree in Artificial Intelligence at the same university in 2007. After completing his PhD he has been a Postdoctoral Researcher at the University of Minnesota, Department of Computer Science and Engineering after which he started as an Assistant Professor at the VU. In 2015 he was a Visiting Scientist at the Computer Science and Artificial Intelligence lab (CSAIL) of the Massachusetts Institute for Technology. In his research, he mainly focuses on predictive modeling and personalization using AI techniques, applied to various domains such as health care. Together with Burkhardt Funk he has written a book on Machine Learning for the Quantified Self, published by Springer mid October 2017.

