

# Preface

Self-tracking has become part of a modern lifestyle; wearables and smartphones support self-tracking in an easy fashion and change our behavior such as in the health sphere. The amount of data generated by these devices is so overwhelming that it is difficult to get useful insight from it. Luckily, in the domain of artificial intelligence, techniques exist that can help out here: machine learning approaches are well suited to assist and enable one to analyze this type of data. While there are ample books that explain machine learning techniques, self-tracking data comes with its own difficulties that require dedicated techniques such as learning over time and across users. In this book, we will explain the complete loop to effectively use self-tracking data for machine learning; from cleaning the data, the identification of features, finding clusters in the data, algorithms to create predictions of values for the present and future, to learning how to provide feedback to users based on their tracking data. All concepts we explain are drawn from state-of-the-art scientific literature. To illustrate all approaches, we use a case study of a rich self-tracking dataset obtained from the crowdsignals platform. While the book is focused on the self-tracking data, the techniques explained are more widely applicable to sensory data in general, making it useful for a wider audience.

Who should read this book? The book is intended for students, scholars, and practitioners with an interest in analyzing sensory data and user-generated content to build their own algorithms and applications. We will explain the basics of the suitable algorithms, and the underlying mathematics will be explained as far as it is beneficial for the application of the methods. The focus of the book is on the application side. We provide implementation in both Python and R of nearly all algorithms we explain throughout the book and make the code available for all the case studies we present in the book as well.

Additional material is available on the website of the book ([ml4qs.org](http://ml4qs.org)):

- Code examples are available in Python and R
- Datasets used in the book and additional sources to be explored by readers
- Up-to-date list of scientific papers and text books related to the book's theme

We have been researchers in this field for over ten years and would like to thank everybody who formed the body of knowledge that has become the basis for this book. First of all, we would like to thank the people at crowdsignals.io for providing us with the dataset that is used throughout the book, Evan Welbourne in particular. Furthermore, we want to thank the colleagues who contributed to the book: Dennis Becker, Ward van Breda, Vincent Bremer, Gusz Eiben, Eoin Grau, Evert Haasdijk, Ali el Hassouni, Floris den Hengst, and Bart Kamphorst. We also want to thank all the graduate students that participated in the Machine Learning for the Quantified Self course at the Vrije Universiteit Amsterdam in June 2017 and provided feedback on a preliminary version of the book that was used as reader during the course. Mark would like to thank (in the order of appearance in his academic career) Maria Gini, Catholijn Jonker, Jan Treur, Gusz Eiben, and Peter Szolovits for being such great sources of inspiration.

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