

Preface

Python is becoming more and more popular among scientists. Its application in psychology and neuroscience has expanded from scripting computer-based experimental tasks to all aspects of research, including but not limited to data collection, analysis, and visualization.

I had no experience with computer programming when I entered graduate school about 16 years ago. I looked hard for a programming book for psychology students who typically know little about programming. Sadly, there were none at that time. I spent quite some time trying out different programming languages and tools and finally settled down with Python for its easy syntax, flexibility, versatility, and open community.

The content of this book is based mainly on my personal research experience and on materials from the workshops and courses I have taught. There are now a couple of Python programming books that feature tools designed for psychologists (e.g., PsychoPy). What sets this book apart is its focus on eye-tracking.

Eye-tracking is a commonly used research technique in cognitive and neuroscience labs. It will be a big surprise if you cannot find an eye-tracker in the psychology department of any university around the world. The eye-trackers used in psychology labs are typically faster, more accurate, and of course, more expensive than the ones seen in consumer goods (e.g., VR goggles) or usability labs. The eye-trackers featured in this book are the EyeLink series trackers, manufactured by a Canadian company, SR Research Ltd. EyeLink eye-trackers are arguably the best research-grade ones available on the market. This high-speed eye-tracker has unmatched precision and accuracy, and it has been used in well over 8000 peer-reviewed publications in journals like Current

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Biology, Journal of Neuroscience, Nature, Nature Neuroscience, Psychological Science, Science, to name but a few.

This book will first introduce the building blocks and syntax of Python, then discuss libraries that we can use to program psychology experiments, i.e., PsychoPy and Pygame. For eye-tracking, this book will feature the Pylink library, a Python interface to the EyeLink Developer's Kit. The example scripts accompanying this book are freely available on GitHub, https://github.com/zhiguo-eyelab/Pylink_book/tree/master/example_scripts. This book is a useful reference for eye-tracking researchers, but you can also use it in graduate or undergraduate level programming courses.

Special thanks go to Dr. Sam Hutton, Dr. Yanliang Sun, and my colleagues at SR Research Ltd. for their valuable feedback on an earlier version of this book.

This is a book in progress. Please feel free to drop me a line if you notice any errors or if you have any suggestions to improve the book (pylink.book@gmail.com).