

JavaScript versus Data Science

Toby Hodges and Greg Wilson

Proposed Title

Main title: *JavaScript versus Data Science*

Subtitle: *A Brief Guide for Those Who Regret That This Has Become Necessary*

Author Data

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Book Description

JavaScript is the language of the web. Originally developed for making browser-based interfaces more dynamic, it is now used for large-scale software projects of all kinds, including scientific visualization tools and data services. However, most researchers and data scientists have little or no experience with it, and most introductions to it are written for people who want to build shopping carts rather than share maps of coral reefs.

This book is designed to fill that void. It introduces readers to JavaScript's power and idiosyncracies, and guides them through the key features of the modern version of the language and its tools and libraries. The book places equal focus on client- and server-side programming, and shows readers how to create interactive web content, build and test data services, and visualize data in the browser.

Unique Selling Points

1. Written by two very experienced instructors (between them, the authors have more than thirty years of teaching experience).
2. All of the material is grounded in practical applications that are representative of the problems researchers encounter in real life.

What Readers Will Learn

- Core features of modern JavaScript
- Programming with callbacks and promises
- Creating objects and classes
- Writing HTML and CSS
- Creating interactive pages with React
- Building data services
- Testing
- Data visualization
- Combining everything to create a three-tier web application

Source Code

All material is available at <https://github.com/software-tools-in-javascript/js-vs-ds>.

Key Words

JavaScript, Data science

Audience

From <https://software-tools-in-javascript.github.io/js-vs-ds/en/intro/>:

Bhadra received a BSc in microbiology five years ago, and has worked since then for a biotech firm with labs in four countries. She did a statistics class using R as an undergrad, then learned some more R and some Unix shell scripting in a [Software Carpentry][swc] workshop, but has no other training as a programmer. Bhadra's team is developing tools to detect structural similarities between proteins. They would like to build a browser interface to their tools so that people can test different algorithms on various data sets. This book will show Bhadra how to build, test, and deploy that interface.

Efraim did fieldwork for the Ministry of Natural Resources for thirty-one years. He learned Visual Basic so that he could write Excel macros, then mastered C in order to maintain the control software for some second-hand remote sensing equipment. Efraim recently retired, and is now an active member of several citizen science projects. This book will show him how to create a service to share those projects' data with the world, and how to build a web-based administrative interface for it.

Sumi is completing a PhD in 19th Century history. As part of her research, she is transcribing and cataloging the records of several dozen Japanese-American midwives. She has been creating and customizing WordPress sites for several years, and has picked up bits and pieces of JavaScript while doing so. Sumi is about to start looking for a job, and wants to create an interactive website to showcase her research. This book will fill in some of the gaps in her knowledge and show her how to take advantage of JavaScript's more modern features.

Competition

Ashley Davis: *Data Wrangling with JavaScript*. Manning, 2018. This step-by-step guide to managing data with JavaScript is solidly grounded in real-world problems, but focuses on only one aspect of JavaScript's use (data wrangling), and its reliance on a library developed solely by the author is not necessarily a strength.

Martijn Haverbeke: *Eloquent Javascript*. No Starch Press, 2018. A widely-used programmer-oriented guide to modern JavaScript, it is representative of the many books that *aren't* appropriate for our audience, as it assumes more background in computer science than most researchers have, and does not use examples that researchers will find engaging.

Estimated Page

Not counting code samples, the book is 38,000 words (208 pages formatted as US 6x9).

Estimated Schedule

We completed the book in January 2019, and since then have incorporated errata from several readers. For publication, we would want to make minor revisions to several examples and include more diagrams.

Author Information

Toby Hodges is a bioinformatician turned community coordinator, working on the [Bio-IT Project](#) at [EMBL](#). He teaches a lot of courses in computing, organizes a lot of community-building events, listens to a lot of punk rock, and occasionally still finds time to write code and ride his bike. Toby would like to thank his wife for her support and patience while he swore about how annoying JavaScript is to debug.

Greg Wilson has worked for 35 years in both industry and academia, and is the author or editor of several books on computing and two for children. He co-founded [Software Carpentry][carpentries], a non-profit organization that teaches basic computing skills to researchers, and is now part of the education team at [RStudio](#).

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