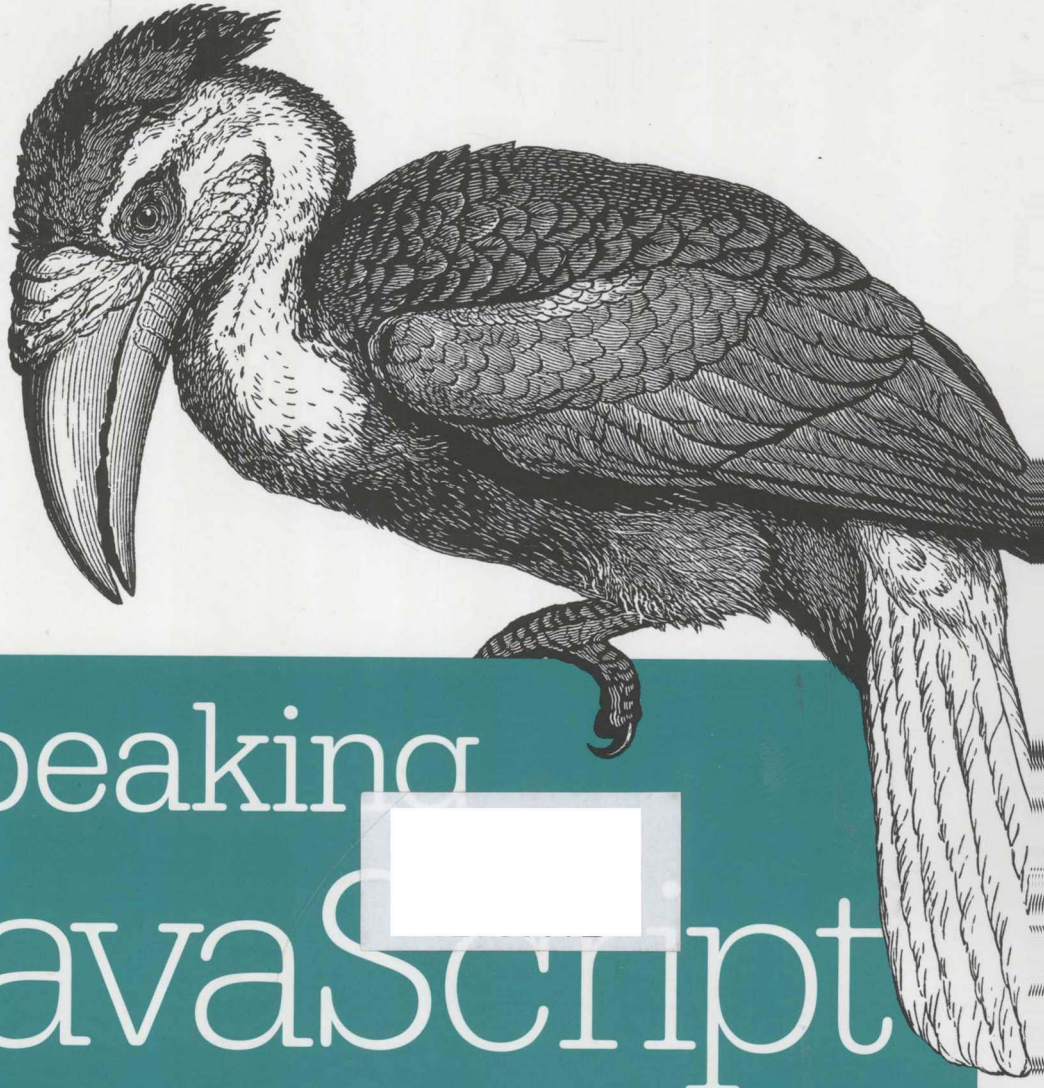
O'REILLY®



Speaking JavaScript

JavaScript新语（影印版）

東南大學出版社

Dr. Axel Rauschmayer 著

JavaScript新语（影印版）

Speaking JavaScript

Axel Rauschmayer 著

Beijing · Cambridge · Farnham · Köln · Sebastopol · Tokyo O'REILLY®

O'Reilly Media, Inc.授权东南大学出版社出版

南京 东南大学出版社

图书在版编目(CIP)数据

JavaScript 新语:英文/(美)劳施迈耶(Rauschmayer,A.)著. —影印本. —南京:东南大学出版社,2015.2
书名原文:Speaking JavaScript
ISBN 978-7-5641-5389-2

Ⅰ.①J… Ⅱ.①劳… Ⅲ.①JAVA 语言—程序设计—英文 Ⅳ.①TP312

中国版本图书馆 CIP 数据核字(2014)第 294379 号

江苏省版权局著作权合同登记
图字:10-2014-165 号

JavaScript 新语(影印版)

出版发行:东南大学出版社
地　　址:南京四牌楼 2 号　　邮编:210096
出 版 人:江建中
网　　址:http://www.seupress.com
电子邮件:press@seupress.com
印　　刷:常州市武进第三印刷有限公司
开　　本:787 毫米×980 毫米　16 开本
印　　张:28.75
字　　数:563 千字
版　　次:2015 年 2 月第 1 版
印　　次:2015 年 2 月第 1 次印刷
书　　号:ISBN 978-7-5641-5389-2
定　　价:84.00 元

本社图书若有印装质量问题,请直接与营销部联系。电话(传真):025-83791830

Praise for *Speaking JavaScript*

"A lot of people think JavaScript is simple and in many cases it is. But in its elegant simplicity lies a deeper functionality that if leveraged properly, can produce amazing results. Axel's ability to distill this into an approachable reference will certainly help both aspiring and experienced developers achieve a better understanding of the language."

—*Rey Bango*
Advocate for cross-browser development, proponent of the open web, and lover of the JavaScript programming language

"Axel's writing style is succinct, to the point, yet at the same time extremely detailed. The many code examples make even the most complex topics in the book easy to understand."

—*Mathias Bynens*
Belgian web standards enthusiast who likes HTML, CSS, JavaScript, Unicode, performance, and security

"*Speaking JavaScript* is a modern, up to date book perfectly aimed at the existing experienced programmer ready to take a deep dive into JavaScript. Without wasting time on laborious explanations, Dr. Rauschmayer quickly cuts to the core of JavaScript and its various concepts and gets developers up to speed quickly with a language that seems intent on taking over the developer world."

—*Peter Cooper*
Publisher, entrepreneur, and co-organizer of Fluent Conference

"If you have enjoyed Axel's blog, then you'll love this book. His book is filled with tons of bite-sized code snippets to aid in the learning process. If you want to dive deep and understand the ins and outs of JavaScript, then I highly recommend this book."

—*Elijah Manor*
Christian, family man, and front end web developer for Dave Ramsey; enjoys speaking, blogging, and tweeting

"This book opens the door into the modern JavaScript community with just enough background and plenty of in-depth introduction to make it seem like you've been with the community from the start."

—Mitch Pronschinske
DZone Editor

"After following Dr. Axel Rauschmayer's work for a few years, I was delighted to learn that he was writing a book to share his deep expertise of JavaScript with those getting started with the language. I've read many JavaScript books, but none that show the attention to detail and comprehensiveness of Speaking JS, without being boring or overwhelming. I'll be recommending this book for years to come."

—Guillermo Rauch
Speaker, creator of socket.io, mongoose, early Node.js contributor, author of "Smashing Node.js", founder of LearnBoost/Cloudup (acq. by Wordpress in 2013), and Open Academy mentor

Preface

Due to its prevalence on the Web and other factors, JavaScript has become hard to avoid. That doesn't mean that it is well liked, though. With this book, I'm hoping to convince you that, while you do have to accept a fair amount of quirks when using it, JavaScript is a decent language that makes you very productive and can be fun to program in.

Even though I have followed its development since its birth, it took me a long time to warm up to JavaScript. However, when I finally did, it turned out that my prior experience had already prepared me well, because I had worked with Scheme, Java (including GWT), Python, Perl, and Self (all of which have influenced JavaScript).

In 2010, I became aware of Node.js, which gave me hope that I'd eventually be able to use JavaScript on both server and client. As a consequence, I switched to JavaScript as my primary programming language. While learning it, I started writing a book chronicling my discoveries. This is the book you are currently reading. On my blog, I published parts of the book and other material on JavaScript. That helped me in several ways: the positive reaction encouraged me to keep going and made writing this book less lonely; comments to blog posts gave me additional information and tips (as acknowledged everywhere in this book); and it made people aware of my work, which eventually led to O'Reilly publishing this book.

Therefore, this book has been over three years in the making. It has profited from this long gestation period, during which I continually refined its contents. I'm glad that the book is finally finished and hope that people will find it useful for learning JavaScript. O'Reilly has agreed to make it available to be read online, for free, which should help make it accessible to a broad audience.

What You Need to Know About This Book

Is this book for you? The following items can help you determine that:

Who this book is for

This book has been written for programmers, by a programmer. So, in order to understand it, you should already know object-oriented programming, for example, via a mainstream programming language such as Java, PHP, C++, Python, Ruby, Objective-C, C#, or Perl.

Thus, the book's target audience is programmers who want to learn JavaScript quickly and properly, and JavaScript programmers who want to deepen their skills and/or look up specific topics.

What's not covered

This book focuses on the JavaScript language proper. For example, you won't find information on programming web browsers (DOM, asynchronous programming, etc.). However, Chapter 33 points to relevant material.

How this book is organized

This book is divided into four parts, but the main two are:

- JavaScript Quick Start
- JavaScript in Depth

These parts are completely independent! You can treat them as if they were separate books: the former is more like a guide, the latter is more like a reference. "The Four Parts of This Book" on page xii tells you more about the structure of this book.

What JavaScript version this book uses

This book teaches ECMAScript 5, the current version of JavaScript that is supported by all modern engines. If you have to work with, say, older web browsers, then Chapter 25 explains what features are exclusive to ECMAScript 5.

Tips for Reading This Book

The most important tip for learning JavaScript is *don't get bogged down by the details.* Yes, there are many details when it comes to the language, and this book covers most of them. But there is also a relatively simple and elegant "big picture" that I will point out to you.

The Four Parts of This Book

This book is organized into four parts:

Part I, JavaScript Quick Start

This part teaches you "Basic JavaScript," a subset of JavaScript that is as small as possible while still enabling you to be productive. The part stands on its own; it doesn't depend on other parts and no other parts depend on it.

Part II, Background
: This part puts JavaScript in historical and technical context: When, why, and how was it created? How is it related to other programming languages? What were the important steps that got us to where we are today?

Part III, JavaScript in Depth
: This part is more of a reference: look for a topic that you are interested in, jump in, and explore. Many short examples should prevent things from becoming too dry.

Part IV, Tips, Tools, and Libraries
: This part gives tips for using JavaScript: best practices, advanced techniques, and learning resources. It also describes a few important tools and libraries.

JavaScript Command Lines

While reading this book, you may want to have a command line ready. That allows you to try out code interactively. The most popular choices are:

Node.js (http://nodejs.org)
: Node.js comes with an interactive command line. You start it by calling the shell command `node`.

Browsers
: All major browsers have consoles for entering JavaScript that is evaluated in the context of the current page. Simply search online for the name of your browser and "console."

Notational Conventions

The following notational conventions are used throughout the book.

Describing syntax

Question marks (?) are used to mark optional parameters. For example:

```
parseInt(str, radix?)
```

French quotation marks (guillemets) denote metacode. You can think of such metacode as blanks, to be filled in by actual code. For example:

```
try {
    «try_statements»
}
```

"White" square brackets mark optional syntactic elements. For example:

```
break ⟦«label»⟧
```

In JavaScript comments, I sometimes use backticks to distinguish JavaScript from English:

```
foo(x, y); // calling function `foo` with parameters `x` and `y`
```

Referring to methods

I refer to built-in methods via their full path:

```
«Constructor».prototype.«methodName»()
```

For example, `Array.prototype.join()` refers to the array method `join()`; that is, JavaScript stores the methods of `Array` instances in the object `Array.prototype`. The reason for this is explained in "Layer 3: Constructors—Factories for Instances" on page 231.

Command-line interaction

Whenever I introduce a new concept, I often illustrate it via an interaction in a JavaScript command line. This looks as follows:

```
> 3 + 4
7
```

The text after the greater-than character is the input, typed by a human. Everything else is output by the JavaScript engine. Additionally, I use the method `console.log()` to print data to the console, especially in (non–command-line) source code:

```
var x = 3;
x++;
console.log(x); // 4
```

Tips, notes, and warnings

This element signifies a tip or suggestion.

This element signifies a general note.

This element indicates a warning or caution.

Quickly Finding Documentation

While you can obviously use this book as a reference, sometimes looking up information online is quicker. One resource I recommend is the Mozilla Developer Network (*https://developer.mozilla.org/en-US/*) (MDN). You can search the Web to find documentation on MDN. For example, the following web search finds the documentation for the `push()` method of arrays:

```
mdn array push
```

Safari® Books Online

Safari Books Online is an on-demand digital library that delivers expert content in both book and video form from the world's leading authors in technology and business.

Technology professionals, software developers, web designers, and business and creative professionals use Safari Books Online as their primary resource for research, problem solving, learning, and certification training.

Safari Books Online offers a range of product mixes and pricing programs for organizations, government agencies, and individuals. Subscribers have access to thousands of books, training videos, and prepublication manuscripts in one fully searchable database from publishers like O'Reilly Media, Prentice Hall Professional, Addison-Wesley Professional, Microsoft Press, Sams, Que, Peachpit Press, Focal Press, Cisco Press, John Wiley & Sons, Syngress, Morgan Kaufmann, IBM Redbooks, Packt, Adobe Press, FT Press, Apress, Manning, New Riders, McGraw-Hill, Jones & Bartlett, Course Technology, and dozens more. For more information about Safari Books Online, please visit us online.

How to Contact Us

Please address comments and questions concerning this book to the publisher:

O'Reilly Media, Inc.
1005 Gravenstein Highway North
Sebastopol, CA 95472
800-998-9938 (in the United States or Canada)
707-829-0515 (international or local)
707-829-0104 (fax)

We have a web page for this book, where we list errata, examples, and any additional information. You can access this page at *http://oreil.ly/speaking-js*.

To comment or ask technical questions about this book, send email to *bookquestions@oreilly.com*.

For more information about our books, courses, conferences, and news, see our website at *http://www.oreilly.com*.

Find us on Facebook: *http://facebook.com/oreilly*

Follow us on Twitter: *http://twitter.com/oreillymedia*

Watch us on YouTube: *http://www.youtube.com/oreillymedia*

Acknowledgments

I would like to thank the following people, all of whom helped make this book possible.

Preparing for JavaScript

The following people laid the foundations for my understanding of JavaScript (in chronological order):

- Prof. François Bry, Sven Panne, and Tim Geisler (Scheme)
- Prof. Don Batory (technical writing, programming language design)
- Prof. Martin Wirsing, Alexander Knapp, Matthias Hölzl, Hubert Baumeister, and various other former colleagues at the Institute for Informatics of the University of Munich (formal methods, various software engineering topics)

Help with JavaScript

Participants of the es-discuss mailing list
: Their answers helped me understand the design of JavaScript. I am deeply thankful for their patience and tirelessness. Four people stood out: Brendan Eich, Allen Wirfs-Brock, Mark Miller, and David Herman.

Readers of my blog 2ality (http://www.2ality.com)
: I published bits and pieces of this book on my blog and got an incredible amount of useful feedback. A few names among many: Ben Alman, Brandon Benvie, Mathias Bynens, Andrea Giammarchi, Matthias Reuter, and Rick Waldron.

More sources are acknowledged in the chapters.

Reviewers

I am much obliged to the following people who reviewed this book. They provided important feedback and corrections. In alphabetical order:

- Mathias Bynens
- Raymond Camden
- Cody Lindley
- Shelley Powers
- Andreas Schroeder
- Alex Stangl
- Béla Varga
- Edward Yue Shung Wong

Table of Contents