



Learn Apple HomeKit on iOS

A Home Automation Guide for
Developers, Designers, and
Homeowners

Jesse Feiler

Apress®

Learn Apple HomeKit on iOS

A Home Automation Guide for Developers,
Designers, and Homeowners



Jesse Feiler

Apress®

Learn Apple HomeKit on iOS: A Home Automation Guide for Developers, Designers, and Homeowners

Jesse Feiler
Plattsburgh, New York
USA

ISBN-13 (pbk): 978-1-4842-1528-9 ISBN-13 (electronic): 978-1-4842-1527-2
DOI 10.1007/978-1-4842-1527-2

Library of Congress Control Number: 2016960323

Copyright © 2016 by Jesse Feiler

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

Trademarked names, logos, and images may appear in this book. Rather than use a trademark symbol with every occurrence of a trademarked name, logo, or image we use the names, logos, and images only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringement of the trademark.

The use in this publication of trade names, trademarks, service marks, and similar terms, even if they are not identified as such, is not to be taken as an expression of opinion as to whether or not they are subject to proprietary rights.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Managing Director: Welmoed Spahr

Lead Editor: Aaron Black

Technical Reviewer: Aaron Crabtree

Editorial Board: Steve Anglin, Pramila Balan, Laura Berendson, Aaron Black, Louise Corrigan, Jonathan Gennick, Robert Hutchinson, Celestin Suresh John, Nikhil Karkal, James Markham, Susan McDermott, Matthew Moodie, Natalie Pao, Gwenan Spearing

Coordinating Editor: Jessica Vakili

Copy Editor: Lori Jacobs

Composer: SPI Global

Indexer: SPI Global

Artist: SPI Global

Distributed to the book trade worldwide by Springer Science+Business Media New York, 233 Spring Street, 6th Floor, New York, NY 10013. Phone 1-800-SPRINGER, fax (201) 348-4505, e-mail orders-ny@springer-sbm.com, or visit www.springeronline.com. Apress Media, LLC is a California LLC and the sole member (owner) is Springer Science + Business Media Finance Inc (SSBM Finance Inc). SSBM Finance Inc is a **Delaware** corporation.

For information on translations, please e-mail rights@apress.com or visit www.apress.com.

Apress and friends of ED books may be purchased in bulk for academic, corporate, or promotional use. eBook versions and licenses are also available for most titles. For more information, reference our Special Bulk Sales-eBook Licensing web page at www.apress.com/bulk-sales.

Any source code or other supplementary materials referenced by the author in this text are available to readers at www.apress.com. For detailed information about how to locate your book's source code, go to www.apress.com/source-code/. Readers can also access source code at SpringerLink in the Supplementary Material section for each chapter.

Printed on acid-free paper



Contents at a Glance

About the Author	ix
About the Technical Reviewer	xi
Acknowledgments	xiii
Introduction	xv
■ Chapter 1: Bringing Home Automation Home.....	1
■ Chapter 2: Exploring the HomeKit World	9
■ Chapter 3: Adding Scenes—The Practical Part of HomeKit.....	27
■ Chapter 4: Exploring Your Development Environment.....	43
■ Chapter 5: Working with HomeKit Accessories	51
■ Chapter 6: Exploring the HomeKit World as a Developer, Designer, or Device Manufacturer	73
■ Chapter 7: Dive into Accessories.....	89

■ Chapter 8: Imaginative Opportunities: Events, Triggers, and Actions.....	101
■ Chapter 9: Working with iCloud and Users with HomeKit	109
Index.....	125



Contents

About the Author	ix
About the Technical Reviewer	xi
Acknowledgments	xiii
Introduction	xv
■ Chapter 1: Bringing Home Automation Home.....	1
Welcome Home	2
2015: Apple Unveils New Technologies	2
CarPlay Revs Up	2
Turning On Apple TV.....	3
Watching the Time	3
Putting It Together	3
Moving Beyond Talking Refrigerators.....	5
How It Works—The View from the Mountaintop	5
Introducing Accessories	6
HomeKit Hubs.....	6
The Basic HomeKit Home	7
Extending HomeKit	7
Summary.....	8

■ Chapter 2: Exploring the HomeKit World	9
Configuring Your HomeKit Environment	10
Starting from an Apple ID	11
Quick Start with iPad.....	12
Managing Home Settings	16
Moving into Your Home	19
Add and Configure a Home.....	21
Edit or Add a Room.....	22
Add and Configure an Accessory.....	24
■ Chapter 3: Adding Scenes—The Practical Part of HomeKit.....	27
What Is a Scene?.....	28
Creating Basic Scenes.....	28
Scenes Can Involve Several Rooms.....	29
Scenes Can Be Automated and Respond to Siri	29
Scenes Are Instantaneous	30
Working with Scenes.....	30
Creating a Scene	32
Adding Accessories	34
Adjusting Accessories.....	37
Finishing Up.....	38
Editing Your Scene	39
■ Chapter 4: Exploring Your Development Environment.....	43
Getting Developer Access.....	44
Reviewing the Tools.....	45
Languages: Swift and Objective-C.....	46
Frameworks.....	47
Simulators	48

Getting Set Up	49
What's Next	49
■ Chapter 5: Working with HomeKit Accessories	51
Set Up a HomeKit Test Lab	51
Set Up HomeKit	53
Setting Up a Room.....	57
Using Automation	63
Automating Location Changes.....	64
Automating Time of Day	66
Letting Accessories Control Automations	67
Bringing It Together	71
■ Chapter 6: Exploring the HomeKit World as a Developer, Designer, or Device Manufacturer	73
HomeKit Overview	74
Swift's Object-Oriented Features for HomeKit.....	74
Creating New Instances	78
Basic HomeKit Objects	78
Working with Rooms	79
Managing Rooms.....	79
Editing a Room	81
Working with Accessories	82
Finding Accessories.....	82
Managing Accessories	84
Editing Accessories	85
■ Chapter 7: Dive into Accessories.....	89
Building Accessories	90
Working with Accessories	90

What Is an Accessory?	91
Basic Accessory Data	92
What Does the Accessory Do? (Services).....	97
Finding Accessory State.....	99
Setting Preferences for the HomeKit Accessory Simulator	99
■ Chapter 8: Imaginative Opportunities: Events, Triggers, and Actions.....	101
Working with Events.....	102
Geofencing with Location Events	102
Monitoring Characteristic Events	103
Working with Triggers	104
Using a Basic Trigger	104
Adding Conditions to Triggers with Predicates	105
Working with Actions.....	105
■ Chapter 9: Working with iCloud and Users with HomeKit	109
Setting Up Hubs.....	110
Apple TV.....	110
iPad.....	111
Setting Up Users.....	112
Inviting Other Users	112
Responding to an Invitation	114
Responding on an iPad	115
Responding on an iPhone	118
Set Permissions for Users	121
Allowing Lock Screen Access.....	123
Index.....	125

About the Author



Jesse Feiler Jesse Feiler helps people and organizations get to know and use new technologies. Projects have included building the page caching module for the Prodigy Web Browser for Mac in the very early days of the Web, location-based apps for iPhone and iOS, as well as books and classes on new technologies. Recent books include *iPad For Seniors for Dummies* (9th ed.) and *Learn Apple HomeKit for iOS*.

Current projects involve using apps and FileMaker databases for identifying and managing risk in nonprofit organizations as well as helping small communities

build location-based apps to promote tourism, downtown economic development, and the wise use of natural resources.

He is founder and president of Friends of Saranac River Trail (saranacrivertrail.org) whose flagship events are the annual Talks, Treks & Tasks which include treks to the Plattsburgh Water Pollution Control Plant, treks focusing on edible plants along the trail as well as invasive species, and talks on current issues in trail and path design and development.

Born in Washington, DC, Jesse currently lives in Plattsburgh, NY, where this book was written.

For more information on development as well as updates to this book, visit Jesse's web site at northcountryconsulting.com. For information on his apps and app consulting, visit champlainarts.com.



About the Technical Reviewer

Aaron Crabtree A passionate developer and experience enthusiast, Aaron Crabtree has been involved in mobile development since the dawn of the mobile device. He has written and provided technical editing for a variety of books on the topic, as well as taken the lead on some very cool, cutting-edge projects over the years. His latest endeavor, building apps for augmented reality devices, has flung him back where he wants to be: as an early adopter in an environment that changes day by day as new innovation hits the market. Hit him up on Twitter where he tweets about all things mobile and AR: @aaron_crabtree.



Acknowledgments

As always, thanks to Carole Jelen at Waterside Productions. Aaron Crabtree has once again provided great help in the technical issues of an Apple technology. At Apress, Jessica Vakili and Aaron Black have been invaluable in helping to bring this book into being.

Introduction

HomeKit is something new from Apple. Something really new. It's not a new device like an iPhone, an iPad, or even the Mac itself. And it's not a new app like Pages, Keynote, or even Xcode, the heavy-duty app that is used by Apple and third-party developers to build apps as well as the operating systems themselves (macOS, iOS, tvOS, and now watchOS). HomeKit is basically a data management framework that manages home automation. It joins Apple's HealthKit, which is another data management framework that focuses on health.

There's a pattern here. Apple is bringing its massive resources to a targeted database and framework in the expectation that third-party developers of software and hardware will gather around the framework. It's no coincidence that HomeKit actually runs on the Apple iOS devices: as the HomeKit ecosystem grows, more and more people use it and appreciate the ease of use that comes with most of what Apple touches. The HomeKit framework is designed to support accessories such as lamps, doors and their locks, thermostats, sensors, and the other automated components of a home for the 21st century. And the fact that this flexible and powerful framework just happens to run on the Apple devices is a great incentive for Apple to have built it and to build it in such a way that it is robust enough to handle yet-undreamed-of devices from developers and vendors around the world.

The architecture of a framework such as HomeKit (and HealthKit) is such that there's a relatively modest investment of skill and time needed to extend and customize it for all of the third-party accessories that integrate with it. This is one way of whittling away at the enormous backlog of code that needs to be written to bring the benefits of modern technology to as many people as possible.

This book provides you with two introductions to HomeKit. In the first chapters, you'll see how to set up HomeKit in your home and how to manage your home's *accessories*, *rooms*, and *scenes* (those everyday terms are used in HomeKit's vocabulary with their everyday meanings).

In the second part of the book, you'll see how the point-and-tap commands from the first part of the book can be reimplemented in code so that you can build your own HomeKit apps that combine the components of HomeKit in new and different ways.

As we move into this new type of technology (the kits of frameworks and data management), you can use HomeKit as your entrée to gain experience with a new way of working with technology. If you're not particularly interested in how the software development world is changing with these kits, feel welcome: you can use HomeKit to manage your home's rooms, scenes, and accessories.

Managing your home in this way can make your life easier, but it also can pay off. Deciding when lights and appliances are used helps you create a comfortable home that does not waste electricity and may even manage the use of electricity in such a way as to take advantage of off-peak lower pricing.

It's time to get started.