

Beginning Android Tablet Games Programming



Jeremy Kerfs

Apress®

Beginning Android Tablet Games Programming

Copyright © 2011 by Jeremy Kerfs

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. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

ISBN-13 (pbk): 978-1-4302-3852-2

ISBN-13 (electronic): 978-1-4302-3853-9

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.

President and Publisher: Paul Manning

Lead Editor: Steve Anglin and Michelle Lowman

Technical Reviewer: Jelani John

Editorial Board: Steve Anglin, Mark Beckner, Ewan Buckingham, Gary Cornell, Morgan Ertel, Jonathan Gennick, Jonathan Hassell, Robert Hutchinson, Michelle Lowman, James Markham, Matthew Moodie, Jeff Olson, Jeffrey Pepper, Douglas Pundick, Ben Renow-Clarke, Dominic Shakeshaft, Gwenan Spearing, Matt Wade, Tom Welsh

Coordinating Editor: Anita Castro

Copy Editor: Tiffany Taylor

Compositor: Bytheway Publishing Services

Indexer: SPI Global

Artist: SPI Global

Cover Designer: Anna Ishchenko

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.

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 is 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/.

Contents at a Glance

■ About the Author.....	ix
■ About the Technical Reviewer	x
■ Acknowledgments	xi
■ Chapter 1: Setting Up Android 3.0 Java Development.....	1
■ Chapter 2: Creating Simple Games with Sprites and Movement	27
■ Chapter 3: Creating Gathering User Input.....	47
■ Chapter 4: Adding Sound Effects, Music, and Video	69
■ Chapter 5: One-Player Game with Obstacles	87
■ Chapter 6: A Ball and Paddle Game	103
■ Chapter 7: Building a Two-Player Game	121
■ Chapter 8: A One-Player Strategy Game Part I	137
■ Chapter 9: A One-Player Strategy Game Part II	151
■ Chapter 10: Publishing the Game	167
■ Appendix A: Testing Android Games on a Real Device	179
■ Index	181

Contents

■ About the Author	ix
■ About the Technical Reviewer	x
■ Acknowledgments	xi
■ Chapter 1: Setting Up Android 3.0 Java Development	1
What Is Android?	1
The Beginnings of Android	1
Android 3.0 Features	2
What You Need to Create Android Games	3
What You Need to Know	3
What You Need for a Platform	4
Setting Up Your Android Tablet Programming Environment	5
Installing the Java JDK	5
Installing the Eclipse IDE	8
Installing the Android SDK.....	10
Adding Android Tools and a Virtual Device to Eclipse	15
Putting Your Tools to the Test	18
Creating an Android Project.....	19
Exploring the Android Project in Eclipse.....	22
Creating a Virtual Android Device.....	23
Running the App	24
Making Your First Changes to the App	25

Summary	26
■ Chapter 2: Creating Simple Games with Sprites and Movement	27
Working with Images	27
Creating a Image Display Surface	28
Rendering an Image	32
Working with Sprites	34
Running a Game	40
Getting a Professional Look	41
Implementing Timing and Complex Motion	42
Detecting Collisions	44
Summary	45
■ Chapter 3: Creating Gathering User Input	47
Understanding Tablet Input Options	47
Understanding Tablet Input	48
Responding to Touch	50
Responding to Gestures.....	53
Using Input Queues.....	57
Responding to Sensor Data	63
Using Sensor Data	66
Summary	68
■ Chapter 4: Adding Sound Effects, Music, and Video	69
Getting Ready for Sounds	69
Finding and Adding Sound Effects.....	70
Playing a Sound Effect.....	71
Managing Multiple Sound Effects.....	71
Matching Sound Effects to Events.....	76

Adding Music	77
Adding Video	78
Managing Music	78
Summary	86
■ Chapter 5: One-Player Game with Obstacles	87
Planning a One-Player Game: AllTogether	87
Building the One-Player Game.....	88
Upgrading the Game Sprites.....	89
Adding a Reward for Winning the Game.....	92
Tracking the State of Game Sprites.....	93
Summary	102
■ Chapter 6: A Ball and Paddle Game	103
Getting Started.....	103
Gathering Game Resources	103
Creating a New Project.....	104
Preparing the Game Environment.....	106
Modifying SpriteObject.java.....	106
Modifying GameView.java	106
Adding Collision Detection and Event Handling	109
Adding Touch, Sound, and Rewards.....	114
Adding Touch Control of the Paddle	114
Adding Sound	115
Instantiating the Blocks.....	116
Removing Dead Blocks.....	118
Summary	119

- **Chapter 7: Building a Two-Player Game** **121**
- Understanding Multiplayer Games..... 121
 - Multiplayer Games through a Server 122
 - Multiplayer Games with Peer-to-Peer 122
 - Choosing a Multiplayer Method 123
- Building a Two-Player Peer-to-Peer Game** **124**
 - Adding Bluetooth Connections 124
 - Managing Bluetooth Connections..... 128
 - Adapting the Game Code for Two Players 135
 - Testing the Game..... 136
- Summary 136
- **Chapter 8: A One-Player Strategy Game Part I** **137**
- Introducing Harbor Defender 138
- Assembling Harbor Defender..... 138
 - Constructing the Pier 139
 - Adding the Ground and Castle 142
 - Creating the Boats 143
 - Adding Cannons..... 145
 - Adding Images..... 146
- Debugging Harbor Defender 147
- Summary 149
- **Chapter 9: A One-Player Strategy Game Part II** **151**
- Enhancing the Game Sprites 152
- Creating the User Controls..... 153
- Putting Everything on the Screen 158
- Deploying and Managing the Attack Boats..... 159
- Firing the Cannons..... 160

Managing Game Outcomes.....	163
Analyzing the Game	165
Summary	166
■ Chapter 10: Publishing the Game	167
Polishing the Application	167
Adding an Splash Screen	167
Responding to a Start Game Button Press	170
Packaging the Game.....	171
Deploying the Game.....	174
Opening a Google Developer Account	176
Uploading a Game to Google Market	177
Marketing Your Game	177
Summary	178
■ Appendix A: Testing Android Games on a Real Device	179
■ Index	181

About the Author



■ **Jeremy Kerfs** is a technical writer for various robotics and consumer-technology magazines. He has taught basic computer science classes for children, and he continues to work as a web development consultant. His passion for entrepreneurship and programming led him to recently create Laughing Studios with the goal of developing mobile games and applications.

He keeps his sanity by playing the piano and running. When there is a strong enough breeze, he will be windsurfing on the San Francisco bay.

About the Technical Reviewer



■ **Jelani John** is a freelance developer and animator from Brooklyn. He enjoys making games and playing with new technologies. You can find him at www.jelanijohn.com.

Acknowledgments

Frank Pohlmann, Editorial Director at Apress, gave me the tremendous opportunity to write this book. I am very grateful for your advice and coaching as we hashed out what the book would look like.

A very special thanks to Anita Castro, the coordinating editor, who pushed me through the sometimes arduous task of completing the chapters, graphics, and code for this book. You gave me some incredible advice and were very patient with me throughout the process.

Thank you to all of the editors and reviewers who worked on the project with me. Your technical advice, wordsmithing, and organizational ideas made this book immeasurably better.

I have also had many great mentors and colleagues who prompted me to do what I thought was impossible. Thank you to Dave Briccetti for introducing me to the art of teaching computer science. Paul Spinrad was an amazing editor for *Make Magazine* who inspired me to take on this project after I read his two stunning books. Paul gave me good pointers, was patient with me, and refused to get angry despite my fickleness. I am very grateful to you.