

FLASH MOBILE

Developing Android and
iOS Applications

Matthew David



FLASH MOBILE

DEVELOPING ANDROID AND iOS APPLICATIONS

MATTHEW DAVID



AMSTERDAM • BOSTON • HEIDELBERG • LONDON • NEW YORK • OXFORD
PARIS • SAN DIEGO • SAN FRANCISCO • SINGAPORE • SYDNEY • TOKYO

Focal Press is an imprint of Elsevier



Focal Press is an imprint of Elsevier
30 Corporate Drive, Suite 400, Burlington, MA 01803, USA
The Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, UK

© 2011 Elsevier Inc. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without permission in writing from the publisher. Details on how to seek permission, further information about the Publisher's permissions policies and our arrangements with organizations such as the Copyright Clearance Center and the Copyright Licensing Agency, can be found at our website: www.elsevier.com/permissions.

This book and the individual contributions contained in it are protected under copyright by the Publisher (other than as may be noted herein).

Notices

Knowledge and best practice in this field are constantly changing. As new research and experience broaden our understanding, changes in research methods, professional practices, or medical treatment may become necessary.

Practitioners and researchers must always rely on their own experience and knowledge in evaluating and using any information, methods, compounds, or experiments described herein. In using such information or methods they should be mindful of their own safety and the safety of others, including parties for whom they have a professional responsibility.

To the fullest extent of the law, neither the Publisher nor the authors, contributors, or editors, assume any liability for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions, or ideas contained in the material herein.

ISBN: 978-0-240-81568-8

For information on all Focal Press publications
visit our website at www.elsevierdirect.com

11 12 13 14 15 5 4 3 2 1
Printed in the United States of America

Working together to grow
libraries in developing countries

www.elsevier.com | www.bookaid.org | www.sabre.org

ELSEVIER

BOOK AID
International

Sabre Foundation

FLASH MOBILE

Dedication

Life is comprised of moments. It is what is said and done in these “moments” that defines our lives. My family is forever blessed that the following people shared moments from their lives with us:

Dick and Anne: You both ran the gauntlet with us and we all made it through! We treasure your friendship in ways that words will never be enough.

Marcia, my “mom-in-law”: You are always there, and you are always supporting us. We love you deeply.

Arthur: At the hardest time, you were there. I will never forget.

My deepest thanks I give to my wife and children. I love you, hon.

AUTHOR'S NOTE

When I first used Flash, back in 1996 (it was called FutureSplash back then), the only place you saw Flash was in a web page. Today, Flash is in apps (thank you AIR), on phones (iPhones and Android), tablets (iPad and BlackBerry PlayBook), and even in your TV (hello Google TV!). It has come a long way and it feels like it is just getting started.

This book was a blast to write. The technology is fun, and developing for Android and iOS just feels right with Flash Professional.

There are a lot of great people I need to thank who helped in the creation of this book: first and foremost, Paul Temme, the guy who trusted my idea and saw that the book got the breath of life it needed; Carlin Reagan for pushing me to deliver on time; the good folks at Focal who laid out the content; and all the readers who sent e-mails and offered support. Thanks!

Always feel free to contact me with any questions: matthewadavid@gmail.com

Cheers,
Matthew David
November 5, 2010

FOREWORD

Change: It's what we expect from technology, from the PC to the web, through to HD TV. But nothing has been as disruptive as the change the iPhone and Android phones have brought. For the first time the power of a computer will fit in your hand, you are always connected to the Internet, and these devices are loaded with hardware such as video cameras, microphones, GPS chips, and accelerometers.

As a designer, the last few years have been both exciting and frustrating. Adapting to new technologies has come at a significant cost. For iOS development you need a Mac and a solid understanding of Objective-C; Android requires learning Java; and let's not even get started with this mobile web thing.

Then a funny thing happened on the way to the AT&T store to pick up an iPhone. Adobe had this teen-crazy idea: let's put Flash in your pocket. Unfortunately Apple was not going to have anything to do with it. No Flash on the iPhone for you! So, undaunted, Adobe did an end-around on Apple. If you could not play a Flash movie on the iPhone, why not create an app (containing a modified version of AIR) and stick the Flash content in that way?

Crazy idea? Yes. Did it work? You betcha!

The problem was Steve Jobs. He did not like this idea at all. In what has now become a famous open letter, Steve Jobs publicly decried Flash as a "yesteryear" technology and banished Flash apps from the iTunes App Store.

Undaunted by Mr. Jobs' comments, Adobe changed direction and brought Adobe Integrated Runtime to the Android, BlackBerry, and PalmOS operating systems. What must mean a lot of gnashing teeth over at Apple, Flash content performs very well on mobile devices. It is not slow, as Apple was making the world believe. In fact, it is a designer's dream. Now you can take the content you develop for the web and desktops and port it to an ever-increasing number of mobile devices. No need to learn Java, Objective-C, or any other language. You can just leverage your knowledge of Flash and ActionScript.

Android is fast catching up with Apple's early lead. In addition, other technologies such as Windows Phone 7 are proving to be compelling alternatives to iOS. The thumbscrews are being tightened on Apple.

CONTENTS

Author's Note	xi
Foreword	xiii

Section 1

Setting up Flash CS5 for Android Development.....	3
Designing and Developing for Android Hardware.....	7
Configuring the Android SDK Publish Setting	12
Setting up Flash CS5 for Android Development	15
Installing Your AIR Application onto an Android OS	17
Building Your First Application for Android Using Flash CS5	18
Project 1: Creating Your First App Using Flash CS5.....	27
Setting up Your Development Environment	27
Creating the Graphics.....	35
Building an Application.....	37
Running Your App on Your Android Phone	43

Section 2

Rapid Android Development in Flash CS5	49
Creating Content for Your Android Phone That Does Not Require Programming.....	49
Animation Techniques You Should Use on Mobile Devices	50
Controlling Sound	71
Controlling Video	80
Working in the Third Dimension	83
What You Have Learned.....	86

Project 2: Optimizing Animation, Audio, Video, and Component Use in Your AIR for Android Apps..... 89

Your Building Blocks.....	89
Importing Files into Flash	91
Adding Animation.....	94
Adding Audio	96
Adding Video	96
Testing on Your Android Phone	96

Section 3**Developing Mobile Apps using ActionScript 101**

Enabling Flash to Execute Solutions Faster with AVM 2.0	102
What You Can Expect When You Use AS3	102
Controlling Data	113
Controlling Text	116
Drawing with the Shape Class.....	117
Using ActionScript to Control Animation, Audio, and Video in Your Android Apps	118
Extending Flash with Open Source Libraries	125
Summary.....	125

Project 3: Building Sprite's 123..... 127

Setting Up the Project to Run on an iPhone	128
Setting Up the Timeline.....	131
Adding Interaction to Your Number Screens	134
Completing the Application	137

Section 4**Leveraging Custom iPhone and Android Interface Calls with ActionScript..... 141**

Using Gestures in Your Apps.....	142
Working with Gestures.....	146

Which Way Is Up? Controlling Orientation with the Android Accelerometer	150
Knowing Where You Are, Using Geolocation	152
Loading RSS Data into Flash	153
Adding Permissions to Your Apps	156
Loading Web Pages into the StageWebView	157
Controlling the Use of the Microphone	159
Controlling the Camera	161
Additional Features on AIR 2.5 for Android	164
Summary	164
Project 4: Building a Gesture-Driven Application	165
Getting Started	165
Navigating Using the Tap Gesture	167
Adding a Swipe Gesture to Move from One Screen to the Next	172
Adding Drag and Drop Gestures	174
Using Geolocation to Find Where You Are	176
Summary	178
Section 5	
Building Games with Flash for the Mobile Market	181
Getting Started with Game Development	181
Making It Easier to Write Code with Libraries	184
Using Game Engines	203
Developing Your Game	240
Project 5: Building a Mobile Game	241
Playing Space Rocket	242
Getting Started	242
Game Assets and Default Layer Structure	244
Adding the Code to the Game	245
Controlling the Missiles	251
Controlling the Falling Rocks	254

Section 6

Deploying Mobile Apps with Flash CS5..... 259

Deploying Your Apps to Apple's iTunes.....	259
Deploying Your Apps to Google's Android Market.....	266
Building for iPad Devices	268
Building for Tablets and TV	269
Adding Advertising to Your Apps.....	270
Tracking Your App's Success	270
Marketing Your Apps	271
Summary.....	272

Project 6: Publishing Your Apps into the Many Different App Stores..... 273

Choosing Where to Sell Your Application	273
Publishing Android Apps in Your Own Store.....	274
Deploying to the Android Market.....	275
Running the Gauntlet That Is Apple's iTunes App Store Submission Process	277
Index	283

Companion website: www.visualizetheweb.com/flashmobile

SECTION

1

SETTING UP FLASH CS5 FOR ANDROID DEVELOPMENT

Today, there are 5 billion people around the world using mobile phones. It is a staggering figure. No other technology is advancing at the rapid speed the mobile industry is experiencing. As a frame of reference, there are only 1.7 billion PCs being used around the world.

A new category of mobile phone is rapidly growing: the smart phone (Figure 1.1). Three years ago, a smart phone allowed you to send e-mail. Today, when you think smart phone, you think e-mail, web, games, MMS, video conferencing—you think of a computer in your pocket.

There are a number of companies leading the next wave of smart phone market. Google, Apple, RIM, Nokia, Microsoft, and HP (with Palm) all have their own operating systems and hardware. It seems almost every three to six months these companies leapfrog each other. Consider this—at the end of 2009, a mobile phone running at 500 MHz with a 3 MB camera was considered screaming fast. Now, you can pick up those same phones for less than \$100. If you want



Figure 1.1 A small selection of smart phones.

something faster you go for 1 GHz with a 1 GB of RAM, an 8 MP camera, front and rear facing cameras, proximity devices up the wazoo, and sophisticated operating systems (OS) that rival, and in some cases exceed, what you can accomplish on your desktop. And in 2011, companies that make the ultra-efficient system-on-chip designs used in mobile phones such as Qualcomm's Snapdragon are headed to 2 GHz with multicore infrastructures housing accelerated GPUs, CPUs, and a ton of RAM.

This is not a mobile phone in your pocket. It is a screamingly fast computer.

With this all said, the smart phone market is still very small. You can take all the iPhones, Android phones (Figure 1.2), and BlackBerrys and you will have less than 300 million devices worldwide. With a global figure of 5 billion mobile users, it is clear that the smart phone market has massive potential for growth.

So, what does it mean to develop for a smart phone? At the end of the day, there are essentially two ways you can develop for a smart phone:

- Develop directly to the software development kit (SDK)
- Develop using an intermediate technology

Each mobile device comes with an SDK that you can use for development. An SDK comes with the development tools, bundling tools, and emulators you need to test your code. When you need access to the latest and greatest technology, you need to use an SDK.



Figure 1.2 A Samsung Android phone.

The challenge you have with using core SDKs is that you need to use the native development language. This is different for each SDK. For instance, Apple prefers you use Objective-C whereas Google prefers you use Java.

The second way to develop mobile devices is to use an intermediate technology that allows you to build for multiple devices using only one language. An example of this is the 3D game development technology called Unity 3D. Unity uses JavaScript to let you to script your games and then converts the JavaScript into code that will allow you to build iPhone, Android, and Windows Desktop applications. The downside to using intermediate technologies is that you are dependent on the development company to update their tools to the latest SDKs and technologies. This can be hard work as the SDKs are frequently updated. For instance, Apple has updated its iOS operating system four times in three years, and Google's Android has been updated five times in less than two years.

With that said, it is much easier to develop using intermediate languages. You can leverage skills you already have without having to go through the learning curve of adopting a new language.

In May 2010 at the Google I/O conference, Adobe announced that it would be bringing both the Flash Player and AIR (Adobe Integrated Runtime) to Google's Android 2.2. This is really big news for Flash developers for several reasons:

1. The version of Flash coming to the Android is the latest 10.1 version, not some crippled alternative.



Figure 1.3 Here you can see a collection of Android phones from different providers that are all capable of running Flash and AIR.

2. AIR gives you an immediate in-road into mobile device development, leveraging the tools and knowledge you already have.
3. Flash is coming to 19 other mobile device companies.
4. Android runs on tablets and TVs as well as phones.

The Flash Player that is now available for all Android 2.2 users, shown in Figure 1.3, is very efficient. There has been a lot of noise from companies such as Apple stating that Flash is a battery hog and will kill your phone's CPU. Is this true? The reality is that it is not. Tests have been conducted showing that the Flash Player on mobile devices is highly efficient and does not cause the CPU-crippling results Apple is stating. The Flash Player works inside the browser in Android. You trigger the use of the Flash Player by tapping on the Flash content in the web page. For instance, you can view a Hulu.com video by tapping on the content in the page.

Adobe's modification of AIR for mobile devices was the really big story at Google's I/O. AIR is a very powerful, mobile technology. It reaches for the same goals that Java set in the 1990s: write once, run anywhere. Unlike Java, AIR really achieves its goal. AIR apps are built in the Flash Professional development environment using Flash technologies you are already used to, such as ActionScript to program your solutions, MPEG video for video, and the same animation techniques you have been using for years.

Adobe's support for Flash on mobile devices will be coming to 19 other mobile development companies. This means that the techniques you learn in this book will be applicable beyond just Android. Other entities that will be adopting Adobe's technologies include RIM's BlackBerry, Nokia, HP/Palm WebOS, and Microsoft's Windows Phones Series 7. Notably absent is Apple, Inc. The year 2010 will go down as the year that Apple drew a line in the sand and said very publicly, "We will not support Adobe's Flash." It is a shame that Apple has made this stance, since Apple's iOS is a very important part of the mobile market. Let's hope it changes its mind.

Earlier I mentioned how rapidly the mobile market is growing. Today, that market is predominantly composed of phones; but there are additional tools joining this market. During 2010, Apple released the massively popular iPad, a tablet computer that is very mobile and very light. Not to be outdone, rival companies, such as Nvidia, Samsung, Dell, and Cisco, are also coming out with their own tablets. The devices range in size from 5 inches all the way up to 11 inches and beyond. What they all share is that they are running Android as their OS. They come prepackaged with support for Flash.

Another device that is coming out of the mobile world is Google TV. At its essence, Google TV is really a modified version