AdvancED Flash on Devices

Mobile Development with Flash Lite and Flash 10

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I would like to dedicate this book to my wife Jordana, who motivated, inspired, and accommodated me—while taking care of our seventeen-month-old baby girl—as I worked long nights to create this book. I also would like to dedicate the book to my mother Elena and brother Lior; I am lucky to have them in my life and to receive their love and support.

—Elad Elrom

This book is dedicated to my mother and father, who take an interest in my life even though they might not always understand all the technology and geeky stuff. I love you. Thanks also to my older brothers Jeff and Paul for always giving good, sound, real-life advice to a younger sibling.

—Scott Janousek

I would like to dedicate this book to my parents, who are always there for me—whether I'm playing in a soccer game or writing a nerdy book. Thanks for always believing in me. Also, I would like to thank my younger brother Brecht, who is doing a great job of becoming a sports teacher. I hope you finish college soon, so you can get all those young people in good shape. I am proud to have you by my side, together with Mom and Dad. I love you all.

—Thomas Joos

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FOREWORD

The technology landscape has never been more exciting, and it has also never been more confusing. Everywhere you look, you see a number of ways to connect to your friends and consume digital content. Mobile devices, your living room consumer electronic devices, PCs, laptops, and netbooks are all increasingly connected and capable of providing a full web experience. All of this is very good news for Flash developers. Flash continues to let developers and designers create rich Internet applications across multiple screens. At Adobe, we have been working very hard on the next generation of the Flash Player for mobile devices as well as for cutting-edge areas, like the digital living room.

One of the core promises of the Flash Player has always been to provide a consistent experience for the user regardless of the operating system or the browser. In a world where not only the operating systems but the hardware and screen sizes are all different, that promise is even more important. You have to be able to reach your customers on whatever device they're using, while still providing the rich user experience that users now expect. There is no better or more efficient platform for creating rich content that will run everywhere than Flash.

Up until now, there hasn't been a book that covers the wide range of the Flash platform, so this book is sorely needed. The breadth of the platform means that Flash developers are under more and more pressure to deliver across all multiple environments. The fact that Flash accounts for over 85 percent of video streamed on the Web means that the traditional Flash world is colliding with other media, and the skill demands on a Flash developer have never been more diverse. Part designer, part developer, and part rich-media guru, the Flash developer needs to have many tools available. This book does a great job of covering the budding mobile space, the browser space, and the desktop space all the while providing tips and tricks to use the tools and technologies of the Flash platform.

This book couldn't have a stronger set of authors. Elad Elrom is a rising star of the Flash development world. He brings a fresh perspective, a strong background, and an inherent knack for the more subtle aspects of the Flash platform. He's been involved very early in a number of Adobe products, providing feedback and ideas to ensure that the platform remains cutting edge. Scott Janousek needs no introduction in most Flash circles. He came early to the world of Flash mobile and has watched it go through many, many iterations. He has built some of the most compelling Flash Lite demonstrations out there and has been a constant resource for the community when it comes to Flash on mobile devices. Having him author a book like this, at a time when Flash on mobile devices has never been more exciting, is a resounding endorsement of both what's inside and what's coming for Flash developers.

The multiscreen experience brings many challenges and many opportunities. As a Flash developer, you've got a leg up on the rest of your competition. The combination of great tools, great services, and a formidable rich media infrastructure means you can target these devices with next-generation user interfaces and media. This book will be a great resource as you navigate the waters of multiscreen and mobile development with the Flash platform.

Ryan Stewart

ABOUT THE AUTHORS

Elad Elrom is a technical writer, technical lead, and senior Flash engineer. As a technical writer, Elad wrote books covering Flash technologies. He maintains an active blog (http://www.elromdesign.com/blog) and has spoken at several conferences regarding the Flash platform. He has helped companies follow the XP and Scrum methodologies to implement popular frameworks, optimize and automate built processors and code review, and follow best practices. Elad has consulted for a variety of clients in different fields and sizes, from large corporations such as Viacom, NBC Universal, and Weight Watchers to startups such as MotionBox.com and KickApps.com.

Scott Janousek is a technical writer, software developer, training instructor, community evangelist, worldwide speaker, and CEO. He is also the owner of Hooken Mobile, a mobile design and development company based in the United States, in the suburbs of Boston, Massachusetts. Scott is an Adobe Certified Flash Designer and Developer as well as a recognized Flash mobile expert. In addition to working with Flash Mobile, he is also currently creating native applications for the iPhone, webOS, and Android platforms. As an active and contributing member of the Adobe Flash Mobile User Group, Boston Flash Platform User Group, Mass Mobile, and Mobile Monday Boston (momoBoston), Scott is passionate about mobile and devices and works with the Flash platform across all sorts of devices and gadgets. For more information about Scott and his latest mobile and device endeavors, check out his personal blog at http://www.scottjanousek.com/blog/.

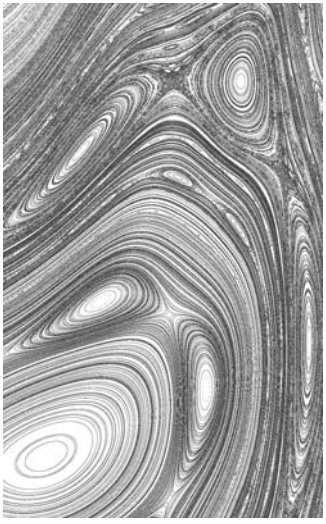
Thomas Joos is a mobile consultant who graduated with a degree in multimedia and communication technology from the Technical University West–Flanders. As a result of his passion for mobile, Thomas specialized in Flash Lite development and mobile concepts and design. In December 2008, he won an Adobe Max Award for Rock Werchter Mobile, the only mobile entry that made it into the European finals. Thomas is always on the lookout for any mobile opportunities that could add value to a client's online campaign, experience, or communication platform. Fueled by his interest in mobile design and concepts, combined with a strong technical knowledge in Flash Lite, Thomas offers a wide variety of mobile consultation, from technical training sessions and workshops to brainstorming meetings, and he's constantly looking for mobile platform opportunities for clients and their online strategies. For more information about Thomas, you can check his personal blog at http://www.thomasjoos.be.

ABOUT THE TECHNICAL REVIEWER

Nancy Nicolaisen is an author, a researcher, and a former computer science professor, specializing in the design and development of small and embedded mobile-device–based solutions. Her three programming books have been printed in five languages. She writes feature and analysis content for Internet-based publishers including Jupitermedia, CodeGuru, and Faulkner Information Services and has published hundreds of feature articles, columns, and analyses in internationally circulated publications including *BYTE*, *PC Magazine*, *Windows Sources*, *Computer Shopper*, *Dr. Dobb's Journal of Software Engineering*, *Microsoft Systems Journal*, *DataBased Advisor*, and *Telecom Advisor*, and for McGraw-Hill/DATAPRO Research Corporation.

Look for her first consumer-oriented book, *Getting Started with Netbooks*, which will be published by friends of ED in 2009. *Getting Started with Netbooks* is a plain-language guide to shopping for best fit and value in your new ultra-mobile computer and learning how to get the most out of the connected mobile lifestyle using cloud computing services and innovative accessories.

ABOUT THE COVER IMAGE DESIGNER



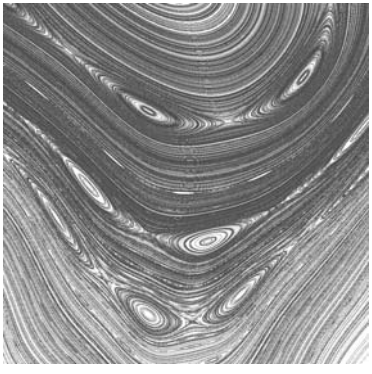
Bruce Tang is a freelance web designer, visual programmer, and author from Hong Kong. His main creative interest is generating stunning visual effects using Flash or Processing.

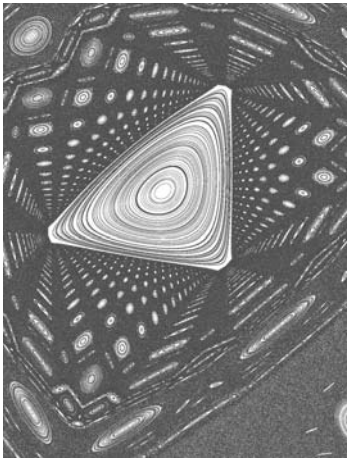
Bruce has been an avid Flash user since Flash 4, when he began using Flash to create games, web sites, and other multimedia content. After several years of ActionScripting, he found himself increasingly drawn toward visual programming and computational art. He likes to integrate math and physics into his work, simulating 3D and other real-life experiences onscreen. His first Flash book was published in October 2005. Bruce's folio, featuring Flash and Processing pieces, can be found at `www.betaruce.com` and his blog at `www.betaruce.com/blog`.

The cover image uses a high-resolution Henon phase diagram generated by Bruce with Processing, which he feels is an ideal tool for such experiments. Henon is a strange attractor created by iterating through some equations to calculate the coordinates of millions of points. The points are then plotted with an assigned color.

$$x_{n+1} = x_n \cos(a) - (y_n - x_n^p) \sin(a)$$

$$y_{n+1} = x_n \sin(a) + (y_n - x_n^p) \cos(a)$$





ACKNOWLEDGMENTS

This book, as you can imagine, is the collective effort of a whole team over at friends of ED, and I would like to thank each and every one of you for the superb team effort in getting this book out in a relatively short amount of time. Specifically, I would like to thank Clay Andres for helping make an idea into this book. Without Clay sharing my enthusiasm, this book wouldn't have been possible.

I would also like to thank Tom Welsh, who made sure to speak what's on his mind about keeping readers' interest and ensuring the high quality of this book. Also, thanks to Nancy Nicolaisen for an excellent technical review and the contribution of the first few pages in Chapter 15, as well as many ideas in this book's chapters. Also, thanks to Sofia Marchant for ensuring that this book stayed on track and for overcoming obstacles.

I would like to thank Adobe evangelists Jason Knell, Ryan Stewart, and Kevin Hoyt for helping me keep in touch with changes that were made in Adobe's line of products and inspiring me while writing this book.

Special thanks go to the Adobe Strobe Team, and in particular to Christine Yarrow and Sumner Paine, who were kind enough to allow us publishing and never-before-seen information about the framework.

I would like to thank my coauthors Scott Janousek and Thomas Joos, who worked day and night to make deadlines while juggling busy schedules and personal lives.

Finally, I would like to thank the mobile and Flash communities for being active and helping inspire much of this book's material, as well as for keeping up with the fragmented mobile ecosystem.

Elad Elrom

Many thanks to Alessandro Pace, Dale Rankine, Mark Doherty, and many other passionate leaders in the worldwide Adobe community for the hours spent evangelizing Flash on mobile and devices over the years. The Flash mobile (and especially the Flash Lite) community is a tight-knit group of great people who are always willing to share opinions, resources, ideas, and knowledge. It has been really great to be a part of the community over the past few years.

To my coauthors, Elad and Thomas, thanks, guys, for hanging in there as we put in all those long hours to make this beast of a book actually happen (finally).

I also want to give big props to the friends of ED team for managing the whole book's process and getting it out to readers, despite many of the obstacles we've encountered along the way. The publishing team at friends of ED rocks!

Scott Janousek

I would like to thank the entire multimedia and communication technology (MCT) crew at the Technical University of West–Flanders for doing a fantastic job providing high-quality and new-media–related education. Going for MCT was one of the best decisions I made and really helped me find out what I wanted to do. Special thanks go to Koen De Weggheleire, who has always inspired and motivated me to get the most out of my projects and my goals.

Many thanks to my coauthors Elad Elrom and Scott Janousek, who worked so hard to make this book great. Besides that, I would like to thank you both for taking me under your wings. Even though there were lots of late nights and long hours, it was a wonderful experience, and I am very proud of the result.

To the entire friends of ED crew, thanks for managing the whole book's process and doing a great job getting this book out to readers. It was a real pleasure working with all of you.

Thomas Joos

INTRODUCTION

The idea of writing this book emerged from the last book Elad coauthored called *AdvancED Flex 3*. In the previous book, Elad wrote an 80-page chapter about mobile devices. Before that book was printed, the team realized that writing a chapter covering Flash Lite may not be suitable for a Flex 3 book, and the chapter was dropped. After a conversation with Clay Andres in Manhattan about trends, technology, Flex, and mobile, Elad and Clay decided that they should do the extraordinary and combine Flash Lite with emerging technologies, taking into account the release of Flash Player 10 on mobile devices; they also decided to include the hard-to-keep-up-with changes to Flash Lite.

Shortly after, Elad was connected with Scott Janousek and Thomas Joos, who shared his vision and helped create this book—it includes theory, relevant real-life examples, as well as never-before-seen tutorials and information on how to develop applications for mobile devices using the Flash platform.

Mobile devices are the most frequently used devices worldwide, and today, the mobile ecosystem is undergoing an exciting revolution. Amid all these changes is the Adobe Open Source Project, which is moving from an idea into a reality with the availability of Flash Player 10 and Adobe Integrated Runtime (AIR) for mobile devices. These exciting changes open up new possibilities for mobile developers and allow you to create cross-platform applications that share code across the devices.

The book is a good starting point if you're a developer interested in getting involved in mobile development using the Flash platform, and it's an equally a great resource for taking mobile development to the next level and moving to more advanced topics and understanding where mobile development is going. This book is suitable for many individuals, whether you're a current Flash Lite developer who wants to push the limits and better understand the mobile ecosystem or a Flex developer who's been reluctant to develop applications for mobile development because you refused to write your code in ActionScript 2.0. This book is also suitable if you're a developer who has never used the Flash platform to develop a mobile application but wants to be part of the exciting possibilities.

The book offers you unparalleled insight into the mobile development world, which is known for being rewarding, as well as complex, fragmented, and rapidly changing. The chapters in this book will cover different versions of Flash content using Flash Player 1.1, 2.0, 2.1, 3.0, 3.1, 9.0, and 10.0. Topics covered in this book include desktop and mobile development using AIR, as well as differences between desktop and web development—as well as how to take these differences into consideration in mobile development. This book includes information regarding existing platforms, content providers, and aggregators that are part of the worldwide mobile ecosystem. It also talks about the communities and desktop and online tools to make your life easier, and it offers exciting tutorials for concepts such as deploying Flash on the iPhone and developing mobile applications using Flash Catalyst, Flex, and AIR.

We believe that this book is a great resource but also a window into the future of mobile development: it addresses not only challenges that mobile developers face today but the new challenges developers will be facing in developing applications with Flash Player 10 and AIR for mobile devices. Our hope is that this book will inspire you to start developing applications for mobile devices.

Layout conventions

To keep this book as clear and easy to follow as possible, the following text conventions are used throughout.

- Code is presented in `fixed-width font`.
- New or changed code is normally presented in **`bold fixed-width font`**.
- Pseudo-code and variable input are written in *`italic fixed-width font`*.
- Menu commands are written in the form Menu ➤ Submenu ➤ Submenu.
- Where we want to draw your attention to something, we've highlighted it like this:

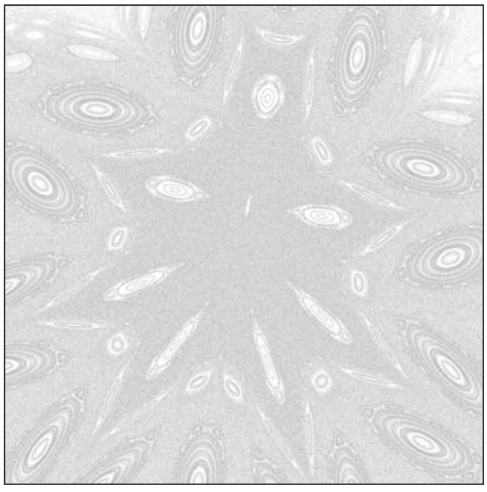
  Ahem, don't say we didn't warn you.

- Sometimes code won't fit on a single line in a book. Where this happens, we use an arrow like this: ➥.

  ```
  This is a very, very long section of code that should be written all ➥
  on the same line without a break.
  ```

Part One

MOBILE DEVELOPMENT LANDSCAPE



Chapter 1

THE MOBILE AND DEVICE LANDSCAPE

Mobile devices are undergoing an exciting revolution today due to the rapid increase in network subscribers as well as the increase in experienced designers, which results in better user interface and hardware innovations such as touch screens. According to *Mobile Magazine*, over a billion people will have a mobile device connected to a 3G network with a fast Internet connection by 2010. As the mobile device changes, consumers' expectations of their mobile devices increase as well.

Amid all these changes, the Adobe Open Source Project is moving the Flash Player from a licensed model to an open source model to compete with other mobile technologies. The announcement of the availability of Flash 10 and Adobe Integrated Runtime (AIR) for mobile devices opens new possibilities to mobile developers.

Many different mobile devices are in use today, including the following:

- **Mobile phones** are the most commonly used electronic devices worldwide. The mobile phone started as a mobile device capable of making phone calls, but recent years have seen a real transition from pure voice to data. Today, mobile phones include many more features than just the ability to make calls and have turned into what are called "smart phones," which include more-capable CPUs and larger memory to support multimedia and other programs that we usually use in our desktops or on the Web. Up until now, mobile phones only supported Flash Lite (FL) and the development was limited to