Android Recipes

A Problem-Solution Approach for Android 5.0
Fourth Edition

Dave Smith

Apress®

Android Recipes: A Problem-Solution Approach for Android 5.0

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Contents at a Glance

About the Author	xxi
About the Technical Reviewer	xxiii
Acknowledgments	xxv
Introduction	xxvii
■ Chapter 1: Layouts and Views	1
■ Chapter 2: User Interaction Recipes	89
■ Chapter 3: Communications and Networking	199
■ Chapter 4: Interacting with Device Hardware and Media	289
■ Chapter 5: Persisting Data	391
■ Chapter 6: Interacting with the System	471
■ Chapter 7: Graphics and Drawing	613
■ Chapter 8: Working with Android NDK and RenderScript	689
Index	737

Contents

About the Authorxxi

About the Technical Reviewerxxiii

Acknowledgmentsxxv

Introductionxxvii

■ Chapter 1: Layouts and Views 1

 1-1. Styling Common Components..... 1

 Problem 1

 Solution..... 1

 How It Works..... 2

 1-2. Toggling System UI Elements..... 11

 Problem 11

 Solution..... 11

 How It Works..... 12

 1-3. Creating and Displaying Views..... 15

 Problem 15

 Solution..... 15

 How It Works..... 15

1-4. Animating a View	22
Problem	22
Solution.....	22
How It Works.....	23
1-5. Animating Layout Changes	28
Problem	28
Solution.....	28
How It Works.....	29
1-6. Implementing Situation-Specific Layouts	32
Problem	32
Solution.....	32
How It Works.....	32
1-7. Customizing AdapterView Empty Views.....	42
Problem	42
Solution.....	42
How It Works.....	42
1-8. Customizing ListView Rows	44
Problem	44
Solution.....	44
How It Works.....	44
1-9. Making ListView Section Headers	48
Problem	48
Solution.....	48
How It Works.....	49
1-10. Creating Compound Controls	56
Problem	56
Solution.....	56
How It Works.....	56
1-11. Customizing Transition Animations	60
Problem	60
Solution.....	60
How It Works.....	61

1-12. Creating View Transformations	70
Problem	70
Solution.....	70
How It Works.....	70
1-13. Making Extensible Collection Views	77
Problem	77
Solution.....	77
How It Works.....	78
Summary	88
■ Chapter 2: User Interaction Recipes	89
2-1. Leveraging the Action Bar	89
Problem	89
Solution.....	89
How It Works.....	90
2-2. Locking Activity Orientation	97
Problem	97
Solution.....	97
How It Works.....	98
2-3. Performing Dynamic Orientation Locking	98
Problem	98
Solution.....	98
How It Works.....	99
2-4. Manually Handling Rotation	101
Problem	101
Solution.....	101
How It Works.....	101
2-5. Creating Contextual Actions.....	104
Problem	104
Solution.....	104
How It Works.....	105

2-6. Displaying a User Dialog Box	110
Problem	110
Solution.....	110
How It Works.....	110
2-7. Customizing Menus and Actions.....	116
Problem	116
Solution.....	116
How It Works.....	116
2-8. Customizing BACK Behavior	122
Problem	122
Solution.....	122
How It Works.....	123
2-9. Emulating the HOME Button.....	126
Problem	126
Solution.....	126
How It Works.....	126
2-10. Monitoring TextView Changes.....	127
Problem	127
Solution.....	127
How It Works.....	127
2-11. Customizing Keyboard Actions	130
Problem	130
Solution.....	130
How It Works.....	131
2-12. Dismissing the Soft Keyboard.....	134
Problem	134
Solution.....	134
How It Works.....	134
2-13. Handling Complex Touch Events	134
Problem	134
Solution.....	134
How It Works.....	136

2-14. Forwarding Touch Events.....	153
Problem	153
Solution.....	153
How It Works.....	153
2-15. Blocking Touch Thieves.....	158
Problem	158
Solution.....	158
How It Works.....	158
2-16. Making Drag-and-Drop Views.....	161
Problem	161
Solution.....	161
How It Works.....	162
2-17. Building a Navigation Drawer	169
Problem	169
Solution.....	169
How It Works.....	170
2-18. Swiping Between Views.....	180
Problem	180
Solution.....	180
How It Works.....	180
2-19. Navigating with Tabs.....	191
Problem	191
Solution.....	191
How It Works.....	191
Summary	198
■ Chapter 3: Communications and Networking.....	199
3-1. Displaying Web Information	199
Problem	199
Solution.....	199
How It Works.....	200

3-2. Intercepting WebView Events	205
Problem	205
Solution.....	205
How It Works.....	205
3-3. Accessing WebView with JavaScript	207
Problem	207
Solution.....	207
How It Works.....	207
3-4. Downloading an Image File	210
Problem	210
Solution.....	210
How It Works.....	210
3-5. Downloading Completely in the Background	213
Problem	213
Solution.....	213
How It Works.....	213
3-6. Accessing a REST API	217
Problem	217
Solution.....	217
How It Works.....	218
3-7. Parsing JSON	237
Problem	237
Solution.....	237
How It Works.....	237
3-8. Parsing XML.....	240
Problem	240
Solution.....	240
How It Works.....	240

3-9. Receiving SMS.....	251
Problem	251
Solution.....	251
How It Works.....	251
3-10. Sending an SMS Message	254
Problem	254
Solution.....	254
How It Works.....	254
3-11. Communicating over Bluetooth.....	257
Problem	257
Solution.....	257
How It Works.....	257
3-12. Querying Network Reachability	266
Problem	266
Solution.....	266
How It Works.....	267
3-13. Transferring Data with NFC.....	270
Problem	270
Solution.....	270
How It Works.....	270
3-14. Connecting over USB	278
Problem	278
Solution.....	278
How It Works.....	279
Summary.....	288
Chapter 4: Interacting with Device Hardware and Media.....	289
4-1. Integrating Device Location	289
Problem	289
Solution.....	289
How It Works.....	290

4-2. Mapping Locations.....	296
Problem	296
Solution.....	296
How It Works.....	299
4-3. Annotating Maps	305
Problem	305
Solution.....	305
How It Works.....	305
4-4. Monitoring Location Regions	321
Problem	321
Solution.....	321
How It Works.....	322
4-5. Capturing Images and Video	331
Problem	331
Solution.....	331
How It Works.....	331
4-6. Making a Custom Camera Overlay.....	337
Problem	337
Solution.....	337
How It Works.....	338
4-7. Recording Audio.....	344
Problem	344
Solution.....	344
How It Works.....	345
4-8. Capturing Custom Video.....	347
Problems	347
Solution.....	347
How It Works.....	347
4-9. Adding Speech Recognition	352
Problem	352
Solution.....	352
How It Works.....	352

4-10. Playing Back Audio/Video	354
Problem	354
Solution.....	354
How It Works.....	355
4-11. Playing Sound Effects	363
Problem	363
Solution.....	363
How It Works.....	364
4-12. Creating a Tilt Monitor	366
Problem	366
Solution.....	366
How It Works.....	367
4-13. Monitoring Compass Orientation	371
Problem	371
Solution.....	371
How It Works.....	371
4-14. Retrieving Metadata from Media Content.....	375
Problem	375
Solution.....	375
How It Works.....	375
4-15. Detecting User Motion	378
Problem	378
Solution.....	378
How It Works.....	379
Summary	390
■ Chapter 5: Persisting Data.....	391
5-1. Making a Preference Screen	391
Problem	391
Solution.....	391
How It Works.....	392

5-2. Displaying Custom Preferences	397
Problem	397
Solution.....	397
How It Works.....	398
5-3. Persisting Simple Data.....	403
Problem	403
Solution.....	404
How It Works.....	404
5-4. Reading and Writing Files	408
Problem	408
Solution.....	408
How It Works.....	409
5-5. Using Files as Resources	416
Problem	416
Solution.....	416
How It Works.....	416
5-6. Managing a Database	419
Problem	419
Solution.....	419
How It Works.....	419
5-7. Querying a Database.....	424
Problem	424
Solution.....	425
How It Works.....	425
5-8. Backing Up Data	426
Problem	426
Solution.....	427
How It Works.....	427

5-9. Sharing Your Database.....	431
Problem	431
Solution.....	431
How It Works.....	432
5-10. Sharing Your SharedPreferences	439
Problem	439
Solution.....	439
How It Works.....	439
5-11. Sharing Your Other Data.....	448
Problem	448
Solution.....	448
How It Works.....	449
5-12. Integrating with System Documents.....	456
Problem	456
Solution.....	456
How It Works.....	457
Summary	470
■ Chapter 6: Interacting with the System.....	471
6-1. Notifying from the Background.....	471
Problem	471
Solution.....	471
How It Works.....	471
6-2. Creating Timed and Periodic Tasks.....	490
Problem	490
Solution.....	490
How It Works.....	491
6-3. Scheduling a Periodic Task	492
Problem	492
Solution.....	492
How It Works.....	494

6-4. Creating Sticky Operations	501
Problem	501
Solution.....	501
How It Works.....	502
6-5. Running Persistent Background Operations	506
Problem	506
Solution.....	506
How It Works.....	507
6-6. Launching Other Applications	513
Problem	513
Solution.....	513
How It Works.....	513
6-7. Launching System Applications	517
Problem	517
Solution.....	517
How It Works.....	517
6-8. Letting Other Applications Launch Your Application	522
Problem	522
Solution.....	522
How It Works.....	522
6-9. Interacting with Contacts.....	525
Problem	525
Solution.....	525
How It Works.....	525
6-10. Reading Device Media and Documents	534
Problem	534
Solution.....	534
How It Works.....	534
6-11. Saving Device Media and Documents	538
Problem	538
Solution.....	538
How It Works.....	538

6-12. Reading Messaging Data	543
Problem	543
Solution.....	543
How It Works.....	545
6-13. Interacting with the Calendar	555
Problem	555
Solution.....	555
How It Works.....	555
6-14. Logging Code Execution	562
Problem	562
Solution.....	562
How It Works.....	562
6-15. Creating a Background Worker	564
Problem	564
Solution.....	564
How It Works.....	564
6-16. Customizing the Task Stack.....	569
Problem	569
Solution.....	569
How It Works.....	570
6-17. Implementing AppWidgets.....	577
Problem	577
Solution.....	577
How It Works.....	578
6-18. Supporting Restricted Profiles	599
Problem	599
Solution.....	599
How It Works.....	600
Summary	612

■ Chapter 7: Graphics and Drawing	613
7-1. Creating Drawables as Backgrounds.....	613
Problem	613
Solution.....	613
How It Works.....	614
7-2. Creating Custom State Drawables	621
Problem	621
Solution.....	621
How It Works.....	622
7-3. Applying Masks to Images	627
Problem	627
Solution.....	627
How It Works.....	628
7-4. Drawing Over View Content	638
Problem	638
Solution.....	638
How It Works.....	639
7-5. High-Performance Drawing	655
Problem	655
Solution.....	655
How It Works.....	656
7-6. Extracting Image Color Palettes.....	667
Problem	667
Solution.....	667
How It Works.....	667
7-7. Tinting Drawable Elements	672
Problem	672
Solution.....	672
How It Works.....	673

7-8. Using Scalable Vector Assets.....	678
Problem	678
Solution.....	678
How It Works.....	679
Summary.....	687
■ Chapter 8: Working with Android NDK and RenderScript.....	689
Android NDK	689
8-1. Adding Native Bits with JNI.....	691
Problem	691
Solution.....	691
How It Works.....	693
8-2. Building a Purely Native Activity	701
Problem	701
Solution.....	701
How It Works.....	702
RenderScript	712
Using the RenderScript Support Package	713
8-3. Filtering Images with RenderScript	714
Problem	714
Solution.....	714
How It Works.....	714
8-4. Manipulating Images with RenderScript.....	720
Problem	720
Solution.....	720
How It Works.....	720
8-5. Faking Translucent Overlays with Blur.....	726
Problem	726
Solution.....	726
How It Works.....	726
Summary.....	736
Index.....	737

About the Author

Dave Smith is a professional engineer developing hardware and software for mobile and embedded platforms. Dave's engineering efforts are currently focused full-time on Android development. Since 2009, Dave has worked on developing at all levels of the Android platform, from writing user applications using the software development kit, to building and customizing the Android source code. Dave regularly communicates via his development blog (<http://blog.wiresareobsolete.com>) and Twitter stream @devunwired.

About the Technical Reviewer

Paul Trebilcox-Ruiz is an Android developer in Boulder, Colorado, and active member in the local Boulder/Denver tech scene. Since moving to Colorado, he has participated in and won multiple hackathons, presented for GDG Denver and has worked on multiple civic coding projects. He currently works on the Android platform at SportsLabs, building and designing applications for university athletics programs across the United States.

Android Recipes is the first book that Paul has contributed to, and an earlier edition of the book was the first Android book that he purchased when learning the platform while obtaining his BS in computer science from California State University, Fresno.

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Introduction

Welcome to the fourth edition of *Android Recipes*!

If you are reading this book, you probably don't need to be told of the immense opportunity that mobile devices represent for software developers and users. In recent years, Android has become one of the top mobile platforms for device users. This means that you, as a developer, must know how to harness Android so you can stay connected to this market and the potential that it offers. But any new platform brings with it uncertainty about best practices and solutions to common needs and problems.

What we aim to do with *Android Recipes* is give you the tools to write applications for the Android platform through direct examples targeted at the specific problems you are trying to solve. This book is not a deep dive into the Android SDK, NDK, or any of the other tools. We don't weigh you down with all the details and theory behind the curtain. That's not to say that those details aren't interesting or important. You should take the time to learn them, as they may save you from making future mistakes. However, more often than not, they are simply a distraction when you are just looking for a solution to an immediate problem.

This book is not meant to teach you Java programming or even the building blocks of an Android application. You won't find many basic recipes in this book (such as how to display text with `TextView`, for instance), as we feel these are tasks easily remembered once learned. Instead, we set out to address tasks that developers, once comfortable with Android, need to do often but find too complex to accomplish with a few lines of code.

Treat *Android Recipes* as a reference to consult, a resource-filled cookbook that you can always open to find the pragmatic advice you need to get the job done quickly and well.

What Will You Find in the Book?

We dive into using the Android SDK to solve real problems. You will learn tricks for effectively creating a user interface that runs well across device boundaries. You will become a master at incorporating the collection of hardware (radios, sensors, and cameras) that makes mobile devices unique platforms. We'll even discuss how to make the system work for you by integrating with the services and applications provided by Google and various device manufacturers.

Performance matters if you want your applications to succeed. Most of the time, this isn't a problem because the Android runtime engines get progressively better at compiling bytecode into the device's native code. However, you might need to leverage the Android NDK to boost performance. Chapter 8 offers you an introduction to the NDK and integrating native code into your application using Java Native Interface (JNI) bindings.

The NDK is a complex technology, which can also reduce your application's portability. Also, while good at increasing performance, the NDK doesn't address multicore processing very well for heavy workloads. Fortunately, Google has eliminated this tedium and simplified the execute-on-multiple-cores task while achieving portability by introducing RenderScript. Chapter 8 introduces you to RenderScript and shows you how to use its compute engine (and automatically leverage CPU cores) to process images.

Keep a Level Eye on the Target

Throughout the book, you will see that we have marked most recipes with the minimum API level that is required to support them. Most of the recipes in this book are marked API Level 1, meaning that the code used can be run in applications targeting any version of Android since 1.0. However, where necessary, we use APIs introduced in later versions. Pay close attention to the API level marking of each recipe to ensure that you are not using code that doesn't match up with the version of Android your application is targeted to support.