

Embedded Android

Want to turn your mobile device into a musical instrument? Or equip your game with interactive audio, rather than canned samples? You can do it with Pure Data (Pd), an open source visual programming environment that lets you manipulate digital audio in real time. This concise book shows you how to use Pd—with help from the libpd library—as an easily embeddable and widely portable sound engine. Whether you're an audio developer looking to create musical apps with sophisticated audio capabilities, or an application developer ready to enhance mobile games with real-time procedural audio, *Making Musical Apps* introduces you to Pd and libpd, and provides hands-on instructions for creating musical apps for Android and iOS. Get a crash course in Pd, and discover how to generate and control sounds. Learn how to create and deploy algorithmic compositions that react to a user's activity and environment. Use Java or Objective-C to integrate Pd and libpd into mobile apps. Learn the steps necessary to build libpd-based apps for Android and iOS.

The hidden brain is the voice in our ear when we make the most important decisions in our lives—but we're never aware of it. The hidden brain decides whom we fall in love with and whom we hate. It tells us to vote for the white candidate and convict the dark-skinned defendant, to hire the thin woman but pay her less than the man doing the same job. It can direct us to safety when disaster strikes and move us to extraordinary acts of altruism. But it can also be manipulated to turn an ordinary person into a suicide terrorist or a group of bystanders into a mob. In a series of compulsively readable narratives, Shankar Vedantam journeys through the latest discoveries in neuroscience, psychology, and behavioral science to uncover the darkest corner of our minds and its decisive impact on the choices we make as individuals and as a society. Filled with fascinating characters, dramatic storytelling, and cutting-edge science, this is an engrossing exploration of the secrets our brains keep from us—and how they are revealed.

Fully updated for Android Studio 3.0 and Android 8, the goal of this book is to teach the skills necessary to develop Android based applications using the Android Studio Integrated Development Environment (IDE), the Android 8 Software Development Kit (SDK) and the Java programming language. Beginning with the basics, this book provides an outline of the steps necessary to set up an Android development and testing environment. An overview of Android Studio is included covering areas such as tool windows, the code editor and the Layout Editor tool. An introduction to the architecture of Android is followed by an in-depth look at the design of Android applications and user interfaces using the Android Studio environment. More advanced topics such as database management, content providers and intents are also covered, as are touch screen handling, gesture recognition, camera access and the playback and recording of both video and audio. This edition of the book also covers printing, transitions and cloud-based file storage. The concepts of material design are also covered in detail, including the use of floating action buttons, Snackbars, tabbed interfaces, card views, navigation drawers and collapsing toolbars. In addition to covering general Android development techniques, the book also includes Google Play specific topics such as implementing maps using the Google Maps Android API, and submitting apps to the Google Play Developer Console. Other key features of Android Studio 3 and Android 8 are also covered in detail including the Layout Editor, the ConstraintLayout and ConstraintSet classes, constraint chains and barriers, direct reply notifications and multi-window support. Chapters also cover advanced features of Android Studio such as App Links, Instant Apps, the Android Studio Profiler and Gradle build configuration. Assuming you already have some Java programming experience, are ready to download Android Studio and the Android SDK, have access to a Windows, Mac or Linux system and ideas for some apps to

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develop, you are ready to get started.

Embedded Software Development: The Open-Source Approach delivers a practical introduction to embedded software development, with a focus on open-source components. This programmer-centric book is written in a way that enables even novice practitioners to grasp the development process as a whole. Incorporating real code fragments and explicit, real-world open-source operating system references (in particular, FreeRTOS) throughout, the text: Defines the role and purpose of embedded systems, describing their internal structure and interfacing with software development tools Examines the inner workings of the GNU compiler collection (GCC)-based software development system or, in other words, toolchain Presents software execution models that can be adopted profitably to model and express concurrency Addresses the basic nomenclature, models, and concepts related to task-based scheduling algorithms Shows how an open-source protocol stack can be integrated in an embedded system and interfaced with other software components Analyzes the main components of the FreeRTOS Application Programming Interface (API), detailing the implementation of key operating system concepts Discusses advanced topics such as formal verification, model checking, runtime checks, memory corruption, security, and dependability **Embedded Software Development: The Open-Source Approach** capitalizes on the authors' extensive research on real-time operating systems and communications used in embedded applications, often carried out in strict cooperation with industry. Thus, the book serves as a springboard for further research.

As the embedded world expands, developers must have a strong grasp of many complex topics in order to make faster, more efficient and more powerful microprocessors to meet the public's growing demand. **Embedded Software: The Works** covers all the key subjects embedded engineers need to understand in order to succeed, including Design and Development, Programming, Languages including C/C++, and UML, Real Time Operating Systems Considerations, Networking, and much more. New material on Linux, Android, and multi-core gives engineers the up-to-date practical know-how they need in order to succeed. Colin Walls draws upon his experience and insights from working in the industry, and covers the complete cycle of embedded software development: its design, development, management, debugging procedures, licensing, and reuse. For those new to the field, or for experienced engineers looking to expand their skills, Walls provides the reader with detailed tips and techniques, and rigorous explanations of technologies. Key features include: New chapters on Linux, Android, and multi-core - the cutting edge of embedded software development! Introductory roadmap guides readers through the book, providing a route through the separate chapters and showing how they are linked About the Author Colin Walls has over twenty-five years experience in the electronics industry, largely dedicated to embedded software. A frequent presenter at conferences and seminars and author of numerous technical articles and two books on embedded software, he is a member of the marketing team of the Mentor Graphics Embedded Software Division. He writes a regular blog on the Mentor website (blogs.mentor.com/colinwalls). New chapters on Linux, Android, and multi-core - the cutting edge of embedded software development! Introductory roadmap guides readers through the book, providing a route through the separate chapters and showing how they are linked

The complete, start-to-finish guide to Android development -- from concept to market -- completely updated for the latest Android SDK! • At least one market research firm has predicted that by 2012 there will be more Android phones than iPhones. • Covers application design, development, debugging, packaging, distribution, and much more. • Includes invaluable real-world tips from experienced mobile developers. • This book covers multiple Android SDK versions, which is how developers must work with Android. Android is rapidly gaining traction as an exciting alternative to Apple's iPhone platform, and thousands of developers are eagerly seeking the information they need to begin creating

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Android applications. Drawing on their experience in mobile and wireless software development, the authors walk through the entire process of developing successful Android applications, from concept through coding, testing through distribution. The only book developers will need, *Android Wireless Application Development 2/e* is the comprehensive resource for developers who are new to Android - or to wireless development in general. Conder and Darcey cover:

- Mastering the Android development environment.
- Understanding the entire Android application lifecycle.
- Building effective user interfaces.
- Using Android's APIs for networking, location-based services, data, storage, multimedia, telephony, graphics, and more
- Working with Android's optional hardware-specific APIs
- Designing more effective applications using Notifications and Services
- Developing and testing bulletproof Android applications

The book also provides valuable appendices on Android's Emulator, DDMS, Debug Bridge, and SQLite database, as well as a convenient glossary that demystifies the terminology of mobile development.

What others in the trenches say about *The Pragmatic Programmer*...

“The cool thing about this book is that it’s great for keeping the programming process fresh. The book helps you to continue to grow and clearly comes from people who have been there.” —Kent Beck, author of *Extreme Programming Explained: Embrace Change*

“I found this book to be a great mix of solid advice and wonderful analogies!” —Martin Fowler, author of *Refactoring* and *UML Distilled*

“I would buy a copy, read it twice, then tell all my colleagues to run out and grab a copy. This is a book I would never loan because I would worry about it being lost.” —Kevin Ruland, Management Science, MSG-Logistics

“The wisdom and practical experience of the authors is obvious. The topics presented are relevant and useful.... By far its greatest strength for me has been the outstanding analogies—tracer bullets, broken windows, and the fabulous helicopter-based explanation of the need for orthogonality, especially in a crisis situation. I have little doubt that this book will eventually become an excellent source of useful information for journeymen programmers and expert mentors alike.” —John Lakos, author of *Large-Scale C++ Software Design*

“This is the sort of book I will buy a dozen copies of when it comes out so I can give it to my clients.” —Eric Vought, Software Engineer

“Most modern books on software development fail to cover the basics of what makes a great software developer, instead spending their time on syntax or technology where in reality the greatest leverage possible for any software team is in having talented developers who really know their craft well. An excellent book.” —Pete McBreen, Independent Consultant

“Since reading this book, I have implemented many of the practical suggestions and tips it contains. Across the board, they have saved my company time and money while helping me get my job done quicker! This should be a desktop reference for everyone who works with code for a living.” —Jared Richardson, Senior Software Developer, iRenaissance, Inc.

“I would like to see this issued to every new employee at my company....” —Chris Cleeland, Senior Software Engineer, Object Computing, Inc.

“If I’m putting together a project, it’s the authors of this book that I want. . . . And failing that I’d settle for people who’ve read their book.” —Ward Cunningham

Straight from the programming trenches, *The Pragmatic Programmer* cuts through the increasing specialization and technicalities of modern software development to examine the core process—taking a requirement and producing working, maintainable code that delights its users. It covers topics ranging from personal responsibility and career development to architectural techniques for keeping your code flexible and easy to adapt and reuse. Read this book, and you'll learn how to Fight software rot; Avoid the trap of duplicating knowledge; Write flexible, dynamic, and adaptable code; Avoid programming by coincidence; Bullet-proof your code with contracts, assertions, and exceptions; Capture real requirements; Test ruthlessly and effectively; Delight your users; Build teams of pragmatic programmers; and Make your developments more precise with automation. Written as a series of self-contained sections and filled with entertaining anecdotes, thoughtful examples, and interesting analogies, *The Pragmatic Programmer* illustrates the best practices and major

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pitfalls of many different aspects of software development. Whether you're a new coder, an experienced programmer, or a manager responsible for software projects, use these lessons daily, and you'll quickly see improvements in personal productivity, accuracy, and job satisfaction. You'll learn skills and develop habits and attitudes that form the foundation for long-term success in your career. You'll become a Pragmatic Programmer.

Embedded Android is for Developers wanting to create embedded systems based on Android and for those wanting to port Android to new hardware, or creating a custom development environment. Hackers and moders will also find this an indispensable guide to how Android works.

The first comprehensive guide to discovering and preventing attacks on the Android OS As the Android operating system continues to increase its share of the smartphone market, smartphone hacking remains a growing threat. Written by experts who rank among the world's foremost Android security researchers, this book presents vulnerability discovery, analysis, and exploitation tools for the good guys. Following a detailed explanation of how the Android OS works and its overall security architecture, the authors examine how vulnerabilities can be discovered and exploits developed for various system components, preparing you to defend against them. If you are a mobile device administrator, security researcher, Android app developer, or consultant responsible for evaluating Android security, you will find this guide is essential to your toolbox. A crack team of leading Android security researchers explain Android security risks, security design and architecture, rooting, fuzz testing, and vulnerability analysis Covers Android application building blocks and security as well as debugging and auditing Android apps Prepares mobile device administrators, security researchers, Android app developers, and security consultants to defend Android systems against attack Android Hacker's Handbook is the first comprehensive resource for IT professionals charged with smartphone security.

Android Programming: The Big Nerd Ranch Guide is an introductory Android book for programmers with Java experience. Based on Big Nerd Ranch's popular Android Bootcamp course, this guide will lead you through the wilderness using hands-on example apps combined with clear explanations of key concepts and APIs. This book focuses on practical techniques for developing apps compatible with Android 4.1 (Jelly Bean) and up, including coverage of Lollipop and material design. Write and run code every step of the way, creating apps that integrate with other Android apps, download and display pictures from the web, play sounds, and more. Each chapter and app has been designed and tested to provide the knowledge and experience you need to get started in Android development. Big Nerd Ranch specializes in developing and designing innovative applications for clients around the world. Our experts teach others through our books, bootcamps, and onsite training. Whether it's Android, iOS, Ruby and Ruby on Rails, Cocoa, Mac OS X, JavaScript, HTML5 or UX/UI, we've got you covered. The Android team is constantly improving and updating Android Studio and other tools. As a result, some of the instructions we provide in the book are no longer correct. You can find an addendum addressing breaking changes at:

<https://github.com/bignerdranch/AndroidCourseResources/raw/master/2ndEdition/Errata/2eAddendum.pdf>.

Looking to port Android to other platforms such as embedded devices? This hands-on book shows you how Android works and how you can adapt it to fit your needs. You'll delve into Android's architecture and learn how to navigate its source code, modify its various components, and create your own version of Android for your particular device. You'll also discover how Android differs from its Linux roots. If you're experienced with embedded systems development and have a good handle on Linux, this book helps you mold Android to hardware platforms other than mobile devices. Learn about Android's development model and the hardware you need to run it Get a quick primer on

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Android internals, including the Linux kernel and Dalvik virtual machine Set up and explore the AOSP without hardware, using a functional emulator image Understand Android's non-recursive build system, and learn how to make your own modifications Use evaluation boards to prototype your embedded Android system Examine the native user-space, including the root filesystem layout, the adb tool, and Android's command line Discover how to interact with—and customize—the Android Framework.

Pro Android 4 shows you how to build real-world and fun mobile apps using the new Android SDK 4 (Ice Cream Sandwich), which unifies Gingerbread for smartphones, Honeycomb for tablets and augments further with Google TV and more. This Android 4 book updates the best selling Pro Android 3 and covers everything from the fundamentals of building apps for embedded devices, smartphones, and tablets to advanced concepts such as custom 3D components, multi-tasking, sensors/augmented reality, better accessories support and much more. Using the tutorials and expert advice, you'll quickly be able to build cool mobile apps and run them on dozens of Android-based smartphones. You'll explore and use the Android APIs, including those for media and sensors. And you'll check out what's new with Android 4, including the improved user interface across all Android platforms, integration with services, and more. After reading this definitive tutorial and reference, you gain the knowledge and experience to create stunning, cutting-edge Android 4 apps that can make you money, while keeping you agile enough to respond to changes in the future.

The open source nature of Linux has always intrigued embedded engineers, and the latest kernel releases have provided new features enabling more robust functionality for embedded applications. Enhanced real-time performance, easier porting to new architectures, support for microcontrollers and an improved I/O system give embedded engineers even more reasons to love Linux! However, the rapid evolution of the Linux world can result in an eternal search for new information sources that will help embedded programmers to keep up! This completely updated second edition of noted author Doug Abbott's respected introduction to embedded Linux brings readers up-to-speed on all the latest developments. This practical, hands-on guide covers the many issues of special concern to Linux users in the embedded space, taking into account their specific needs and constraints. You'll find updated information on: • The GNU toolchain • Configuring and building the kernel • BlueCat Linux • Debugging on the target • Kernel Modules • Devices Drivers • Embedded Networking • Real-time programming tips and techniques • The RTAI environment • And much more The accompanying CD-ROM contains all the source code from the book's examples, helpful software and other resources to help you get up to speed quickly. This is still the reference you'll reach for again and again! * 100+ pages of new material adds depth and breadth to the 2003 embedded bestseller. * Covers new Linux kernel 2.6 and the recent major OS release, Fedora. * Gives the engineer a guide to working with popular and cost-efficient open-source code.

Explore Qt framework and APIs for building cross-platform applications for mobile devices, embedded systems, and IoT Key Features Build cross-platform applications and deploy them across mobile and connected devices Design 2D and 3D UIs for embedded systems using Yocto and Qt Creator Build machine to machine automation solution using QtSensors, QtMQTT, and QtWebSockets Book Description Qt is a world-class framework, helping you to develop rich graphical user interfaces (GUIs) and multi-platform applications that run on all major desktop platforms and most mobile or embedded platforms. The framework helps you connect the dots across platforms and between online and physical experience. This book will help you leverage the fully-featured Qt framework and its modular cross-platform library classes and intuitive APIs to develop applications for mobile, IoT, and industrial embedded systems. Considerations such as screen size, device orientation changes, and small memory will be discussed. We will focus on various core aspects of embedded and mobile systems, such as connectivity, networking, and sensors; there is no IoT without sensors. You will learn how to quickly design a flexible, fast, and responsive UI

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that looks great. Going further, you will implement different elements in a matter of minutes and synchronize the UI elements with the 3D assets with high precision. You will learn how to create high-performance embedded systems with 3D/2D user interfaces, and deploy and test on your target hardware. The book will explore several new features, including Qt for WebAssembly. At the end of this book, you will learn about creating a full software stack for embedded Linux systems using Yocto and Boot to Qt for Device Creation. What you will learn Explore the latest features of Qt, such as preview for Qt for Python and Qt for WebAssembly Create fluid UIs with a dynamic layout for different sized screens Deploy embedded applications on Linux systems using Yocto Design Qt APIs for building applications for embedded and mobile devices Utilize connectivity for networked and machine automated applications Discover effective techniques to apply graphical effects using Qt Quick apps Who this book is for The book is ideal for mobile developers, embedded systems engineers and enthusiasts who are interested in building cross-platform applications with Qt. Prior knowledge of C++ is required.

The International Symposium on Distributed Computing and Artificial Intelligence is an annual forum that brings together ideas, projects, lessons, etc. associated with distributed computing, artificial intelligence and its applications in different themes. This meeting has been held at the University of Salamanca from the 22th to the 24th of October 2008. This symposium has been organized by the Biomedicine, Intelligent System and Educational Technology Research Group (<http://bisite.usal.es/>) of the University of Salamanca. The technology transfer in this field is still a challenge and for that reason this type of contributions has been specially considered in this edition. This conference is the forum in which to present application of innovative techniques to complex problems. The artificial intelligence is changing our society. Its application in distributed environments, such as the Internet, electronic commerce, mobile communications, wireless devices, distributed computing, and so on is increasing and is becoming an element of high added value and economic potential, both industrial and research. These technologies are changing constantly as a result of the large research and technical effort being undertaken in both universities and businesses. The exchange of ideas between scientists and technicians from both academic and business areas is essential to facilitate the development of systems that meet the demands of today's society.

Looking to port Android to other platforms such as embedded devices? This hands-on book shows you how Android works and how you can adapt it to fit your needs. You'll delve into Android's architecture and learn how to navigate its source code, modify its various components, and create your own version of Android for your particular device. You'll also discover how Android differs from its Linux roots. If you're experienced with embedded systems development and have a good handle on Linux, this book helps you mold Android to hardware platforms other than mobile devices. Learn about Android's development model and the hardware you need to run it Get a quick primer on Android internals, including the Linux kernel and Dalvik virtual machine Set up and explore the AOSP without hardware, using a functional emulator image Understand Android's non-recursive build system, and learn how to make your own modifications Use evaluation boards to prototype your embedded Android system Examine the native user-space, including the root filesystem layout, the adb tool, and Android's command line Discover how to interact with—and customize—the Android Framework

GUI Design for Android Apps is the perfect—and concise—introduction for mobile app developers and designers. Through easy-to-follow tutorials, code samples, and case studies, the book shows the must-know principles for user-interface design for Android apps running on the Intel platform, including smartphones, tablets and embedded devices. This book is jointly developed for individual learning by Intel Software College and China Shanghai JiaoTong University, and is excerpted from Android Application Development for the Intel® Platform.

An in-depth exploration of the inner-workings of Android: In Volume I, we take the perspective of the Power User as we delve into the

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foundations of Android, filesystems, partitions, boot process, native daemons and services.

Jump into the world of Near Field Communications (NFC), the fast-growing technology that lets devices in close proximity exchange data, using radio signals. With lots of examples, sample code, exercises, and step-by-step projects, this hands-on guide shows you how to build NFC applications for Android, the Arduino microcontroller, and embedded Linux devices. You'll learn how to write apps using the NFC Data Exchange Format (NDEF) in PhoneGap, Arduino, and node.js that help devices read messages from passive NFC tags and exchange data with other NFC-enabled devices. If you know HTML and JavaScript, you're ready to start with NFC. Dig into NFC's architecture, and learn how it's related to RFID Write sample apps for Android with PhoneGap and its NFC plugin Dive into NDEF: examine existing tag-writer apps and build your own Listen for and filter NDEF messages, using PhoneGap event listeners Build a full Android app to control lights and music in your home Create a hotel registration app with Arduino, from check-in to door lock Write peer-to-peer NFC messages between two Android devices Explore embedded Linux applications, using examples on Raspberry Pi and BeagleBone

Build, customize, and debug your own Android system About This Book Master Android system-level programming by integrating, customizing, and extending popular open source projects Use Android emulators to explore the true potential of your hardware Master key debugging techniques to create a hassle-free development environment Who This Book Is For This book is for Android system programmers and developers who want to use Android and create indigenous projects with it. You should know the important points about the operating system and the C/C++ programming language. What You Will Learn Set up the Android development environment and organize source code repositories Get acquainted with the Android system architecture Build the Android emulator from the AOSP source tree Find out how to enable WiFi in the Android emulator Debug the boot up process using a customized Ramdisk Port your Android system to a new platform using VirtualBox Find out what recovery is and see how to enable it in the AOSP build Prepare and test OTA packages In Detail Android system programming involves both hardware and software knowledge to work on system level programming. The developers need to use various techniques to debug the different components in the target devices. With all the challenges, you usually have a deep learning curve to master relevant knowledge in this area. This book will not only give you the key knowledge you need to understand Android system programming, but will also prepare you as you get hands-on with projects and gain debugging skills that you can use in your future projects. You will start by exploring the basic setup of AOSP, and building and testing an emulator image. In the first project, you will learn how to customize and extend the Android emulator. Then you'll move on to the real challenge—building your own Android system on VirtualBox. You'll see how to debug the init process, resolve the bootloader issue, and enable various hardware interfaces. When you have a complete system, you will learn how to patch and upgrade it through recovery. Throughout the book, you will get to know useful tips on how to integrate and reuse existing open source projects such as LineageOS (CyanogenMod), Android-x86, Xposed, and GApps in your own system. Style and approach This is an easy-to-follow guide full of hands-on examples and system-level programming tips.

The First Practical, Hands-On Guide to Embedded System Programming for Android Today, embedded systems programming is a more valuable discipline than ever, driven by fast-growing, new fields such as wearable technology and the Internet of Things. In this concise guide, Roger Ye teaches all the skills you'll need to write the efficient embedded code necessary to make tomorrow's Android devices work. The first title in Addison-Wesley's new Android™ Deep Dive series for intermediate and expert Android developers, Embedded Programming with Android™ draws on Roger Ye's extensive experience with advanced projects in telecommunications and mobile devices. Step by step, he guides you through building a system with all the key components Android hardware developers must deliver to manufacturing. By the

time you're done, you'll have the key programming, compiler, and debugging skills you'll need for real-world projects. First, Ye introduces the essentials of bare-metal programming: creating assembly language code that runs directly on hardware. Then, building on this knowledge, he shows how to use C to create hardware interfaces for booting a Linux kernel with the popular U-Boot bootloader. Finally, he walks you through using filesystem images to boot Android and learning to build customized ROMs to support any new Android device. Throughout, Ye provides extensive downloadable code you can run, explore, and adapt. You will Build a complete virtualized environment for embedded development Understand the workflow of a modern embedded systems project Develop assembly programs, create binary images, and load and run them in the Android emulator Learn what it takes to bring up a bootloader and operating system Move from assembler to C, and explore Android's goldfish hardware interfaces Program serial ports, interrupt controllers, real time clocks, and NAND flash controllers Integrate C runtime libraries Support exception handling and timing Use U-Boot to boot the kernel via NOR or NAND flash processes Gain in-depth knowledge for porting U-Boot to new environments Integrate U-Boot and a Linux kernel into an AOSP and CyanogenMod source tree Create your own Android ROM on a virtual Android device

Presents instructions for creating Android applications for mobile devices using Java.

This book serves as a practical guide for practicing engineers who need to design embedded systems for high-speed data acquisition and control systems. A minimum amount of theory is presented, along with a review of analog and digital electronics, followed by detailed explanations of essential topics in hardware design and software development. The discussion of hardware focuses on microcontroller design (ARM microcontrollers and FPGAs), techniques of embedded design, high speed data acquisition (DAQ) and control systems. Coverage of software development includes main programming techniques, culminating in the study of real-time operating systems. All concepts are introduced in a manner to be highly-accessible to practicing engineers and lead to the practical implementation of an embedded board that can be used in various industrial fields as a control system and high speed data acquisition system.

Provides transcripts from and assessments of the first season of the Breaking Banks radio show, examining the massive upheaval facing the banking industry today involving consumer shifts, technological changes and increased government scrutiny.

With Bluetooth Low Energy (BLE), smart devices are about to become even smarter. This practical guide demonstrates how this exciting wireless technology helps developers build mobile apps that share data with external hardware, and how hardware engineers can gain easy and reliable access to mobile operating systems. This book provides a solid, high-level overview of how devices use BLE to communicate with each other. You'll learn useful low-cost tools for developing and testing BLE-enabled mobile apps and embedded firmware and get examples using various development platforms—including iOS and Android for app developers and embedded platforms for product designers and hardware engineers. Understand how data is organized and transferred by BLE devices Explore BLE's concepts, key limitations,

and network topology Dig into the protocol stack to grasp how and why BLE operates Learn how BLE devices discover each other and establish secure connections Set up the tools and infrastructure for BLE application development Get examples for connecting BLE to iPhones, iPads, Android devices, and sensors Develop code for a simple device that transmits heart rate data to a mobile device

Filled with practical, step-by-step instructions and clear explanations for the most important and useful tasks. A step-by-step guide which provides concise and clear recipes for getting started with Busybox.If you are an embedded system developer or Android developer who wishes to learn to build an embedded (Android Linux) system from scratch, as well as to optimize the system performance, then this book will be great for you. It's assumed that you have some experience in Linux and UNIX utilities. If you are a new developer, this book will also help you to get started with Busybox and Android Linux development.

Battle-Tested Strategies for Storing, Managing, and Sharing Android Data “Android™ Database Best Practices goes well beyond API documentation to offer strategic advice about how to handle data in an Android application and the tools needed to develop productively. This arms the developer with a trove of solutions to nearly any problem an application may face involving data. Mastering the concepts in this book are therefore essential for any developer who wants to create professional Android applications.” –Greg Milette, Android developer, Gradison Technologies, Inc. This is the first guide to focus on one of the most critical aspects of Android development: how to efficiently store, retrieve, manage, and share information from your app's internal database. Through real-world code examples, which you can use in your own apps, you'll learn how to take full advantage of SQLite and the database-related classes on Android. A part of Addison-Wesley's Android™ Deep Dive series for experienced Android developers, Android Database Best Practices draws on Adam Stroud's extensive experience leading cutting-edge app projects. Stroud reviews the core database theory and SQL techniques you need to efficiently build, manipulate, and read SQLite databases. He explores SQLite in detail, illuminates Android's APIs for database interaction, and shares modern best practices for working with databases in the Android environment. Through a complete case study, you'll learn how to design your data access layer to simplify all facets of data management and avoid unwanted technical debt. You'll also find detailed solutions for common challenges in building data-enabled Android apps, including issues associated with threading, remote data access, and showing data to users. Extensive, up-to-date sample code is available for download at github.com/android-database-best-practices/device-database. You will Discover how SQLite database differs from other relational databases Use SQL DDL to add structure to a database, and use DML to manipulate data Define and work with SQLite data types Persist highly structured data for fast, efficient access Master Android classes for create, read, update, and delete (CRUD) operations

and database queries Share data within or between apps via content providers Master efficient UI strategies for displaying data, while accounting for threading issues Use Android's Intents API to pass data between activities when starting a new activity or service Achieve two-way communication between apps and remote web APIs Manage the complexities of app-to-server communication, and avoid common problems Use Android's new Data Binding API to write less code and improve performance

If you are an Android app developer who wants to experiment with the hardware capabilities of the BeagleBone Black platform, then this book is ideal for you. You are expected to have basic knowledge of developing Android apps but no prior hardware experience is required.

Create the perfectly customized system by unleashing the power of Android OS on your embedded device About This Book Understand the system architecture and how the source code is organized Explore the power of Android and customize the build system Build a fully customized Android version as per your requirements Who This Book Is For If you are a Java programmer who wants to customize, build, and deploy your own Android version using embedded programming, then this book is for you. What You Will Learn Master Android architecture and system design Obtain source code and understand the modular organization Customize and build your first system image for the Android emulator Level up and build your own Android system for a real-world device Use Android as a home automation and entertainment system Tailor your system with optimizations and add-ons Reach for the stars: look at the Internet of Things, entertainment, and domotics In Detail Take a deep dive into the Android build system and its customization with Learning Embedded Android Programming, written to help you master the steep learning curve of working with embedded Android. Start by exploring the basics of Android OS, discover Google's "repo" system, and discover how to retrieve AOSP source code. You'll then find out to set up the build environment and the first AOSP system. Next, learn how to customize the boot sequence with a new animation, and use an Android "kitchen" to "cook" your custom ROM. By the end of the book, you'll be able to build customized Android open source projects by developing your own set of features. Style and approach This step-by-step guide is packed with various real-world examples to help you create a fully customized Android system with the most useful features available.

The ultimate resource for making embedded systems reliable, safe, and secure Embedded Systems Security provides: A broad understanding of security principles, concerns, and technologies Proven techniques for the efficient development of safe and secure embedded software A study of the system architectures, operating systems and hypervisors, networking, storage, and cryptographic issues that must be considered when designing secure embedded systems Nuggets of practical advice and numerous case studies throughout Written by leading authorities in the field with 65 years of embedded security experience: one of the original developers of the world's only Common Criteria EAL 6+ security certified software product and a lead designer of NSA certified cryptographic systems. This book is indispensable for embedded systems and security professionals, new and

experienced. An important contribution to the understanding of the security of embedded systems. The Kleidermachers are experts in their field. As the Internet of things becomes reality, this book helps business and technology management as well as engineers understand the importance of "security from scratch." This book, with its examples and key points, can help bring more secure, robust systems to the market. Dr. Joerg Borchert, Vice President, Chip Card & Security, Infineon Technologies North America Corp.; President and Chairman, Trusted Computing Group Embedded Systems Security provides real-world examples of risk and exploitation; most importantly the book offers clear insight into methods used to counter vulnerabilities to build true, native security into technology. Adriel Desautels, President and CTO, Netragard, LLC. Security of embedded systems is more important than ever. The growth in networking is just one reason. However, many embedded systems developers have insufficient knowledge of how to achieve security in their systems. David Kleidermacher, a world-renowned expert in this field, shares in this book his knowledge and long experience with other engineers. A very important book at the right time. Prof. Dr.-Ing. Matthias Sturm, Leipzig University of Applied Sciences; Chairman, Embedded World Conference steering board Gain an understanding of the operating systems, microprocessors, and network security critical issues that must be considered when designing secure embedded systems Contains nuggets of practical and simple advice on critical issues highlighted throughout the text Short and to-the-point real case studies included to demonstrate embedded systems security in practice

Master the techniques needed to build great, efficient embedded devices on Linux About This Book Discover how to build and configure reliable embedded Linux devices This book has been updated to include Linux 4.9 and Yocto Project 2.2 (Morty) This comprehensive guide covers the remote update of devices in the field and power management Who This Book Is For If you are an engineer who wishes to understand and use Linux in embedded devices, this book is for you. It is also for Linux developers and system programmers who are familiar with embedded systems and want to learn and program the best in class devices. It is appropriate for students studying embedded techniques, for developers implementing embedded Linux devices, and engineers supporting existing Linux devices. What You Will Learn Evaluate the Board Support Packages offered by most manufacturers of a system on chip or embedded module Use Buildroot and the Yocto Project to create embedded Linux systems quickly and efficiently Update IoT devices in the field without compromising security Reduce the power budget of devices to make batteries last longer Interact with the hardware without having to write kernel device drivers Debug devices remotely using GDB, and see how to measure the performance of the systems using powerful tools such as `perf`, `ftrace`, and `valgrind` Find out how to configure Linux as a real-time operating system In Detail Embedded Linux runs many of the devices we use every day, from smart TVs to WiFi routers, test equipment to industrial controllers - all of them have Linux at their heart. Linux is a core technology in the implementation of the inter-connected world of the Internet of Things. The comprehensive guide shows you the technologies and techniques required to build Linux into embedded systems. You will begin by learning about the fundamental elements that underpin all embedded Linux projects: the toolchain, the bootloader, the kernel, and the root filesystem. You'll see how to create each of these elements from scratch, and how to automate the process using Buildroot and the Yocto Project. Moving on, you'll

find out how to implement an effective storage strategy for flash memory chips, and how to install updates to the device remotely once it is deployed. You'll also get to know the key aspects of writing code for embedded Linux, such as how to access hardware from applications, the implications of writing multi-threaded code, and techniques to manage memory in an efficient way. The final chapters show you how to debug your code, both in applications and in the Linux kernel, and how to profile the system so that you can look out for performance bottlenecks. By the end of the book, you will have a complete overview of the steps required to create a successful embedded Linux system.

Style and approach This book is an easy-to-follow and pragmatic guide with in-depth analysis of the implementation of embedded devices. It follows the life cycle of a project from inception through to completion, at each stage giving both the theory that underlies the topic and practical step-by-step walkthroughs of an example implementation. Android development is hot, and many programmers are interested in joining the fun. However, because this technology is based on Java, you should first obtain a solid grasp of the Java language and its foundational APIs to improve your chances of succeeding as an Android app developer. After all, you will be busy learning the architecture of an Android app, the various Android-specific APIs, and Android-specific tools. If you do not already know Java fundamentals, you will probably end up with a massive headache from also having to quickly cram those fundamentals into your knowledge base. *Learn Java for Android Development, Second Edition* teaches programmers of any skill level the essential Java language and foundational Java API skills that must be learned to improve the programmer's chances of succeeding as an Android app developer. Each of the book's 14 chapters provides an exercise section that gives you the opportunity to reinforce your understanding of the chapter's material. Answers to the book's more than 500 exercises are provided in an appendix. A second appendix provides a significant game-oriented Java application, which you can convert into an Android app. Once you complete this book, you should be ready to dive into beginning Android app development. Maybe, start that journey with Apress' *Beginning Android*.

Mobile Applications Development with Android: Technologies and Algorithms presents advanced techniques for mobile app development, and addresses recent developments in mobile technologies and wireless networks. The book covers advanced algorithms, embedded systems, novel mobile app architecture, and mobile cloud computing paradigms. Divided into three sections, the book explores three major dimensions in the current mobile app development domain. The first section describes mobile app design and development skills, including a quick start on using Java to run an Android application on a real phone. It also introduces 2D graphics and UI design, as well as multimedia in Android mobile apps. The second part of the book delves into advanced mobile app optimization, including an overview of mobile embedded systems and architecture. Data storage in Android, mobile optimization by dynamic programming, and mobile optimization by loop scheduling are also covered. The last section of the book looks at emerging technologies, including mobile cloud computing, advanced techniques using Big Data, and mobile Big Data storage. About the Authors Meikang Qiu is an Associate Professor of Computer Science at Pace University, and an adjunct professor at Columbia University. He is an IEEE/ACM Senior Member, as well as Chair of the IEEE STC (Special Technical Community) on Smart Computing. He is an Associate Editor of a dozen of journals including *IEEE Transactions on Computers* and

IEEE Transactions on Cloud Computing. He has published 320+ peer-reviewed journal/conference papers and won 10+ Best Paper Awards. Wenyun Dai is pursuing his PhD at Pace University. His research interests include high performance computing, mobile data privacy, resource management optimization, cloud computing, and mobile networking. His paper about mobile app privacy has been published in IEEE Transactions on Computers. Keke Gai is pursuing his PhD at Pace University. He has published over 60 peer-reviewed journal or conference papers, and has received three IEEE Best Paper Awards. His research interests include cloud computing, cyber security, combinatorial optimization, business process modeling, enterprise architecture, and Internet computing. .

Linux® is being adopted by an increasing number of embedded systems developers, who have been won over by its sophisticated scheduling and networking, its cost-free license, its open development model, and the support offered by rich and powerful programming tools. While there is a great deal of hype surrounding the use of Linux in embedded systems, there is not a lot of practical information. Building Embedded Linux Systems is the first in-depth, hard-core guide to putting together an embedded system based on the Linux kernel. This indispensable book features arcane and previously undocumented procedures for:

- Building your own GNU development toolchain
- Using an efficient embedded development framework
- Selecting, configuring, building, and installing a target-specific kernel
- Creating a complete target root filesystem
- Setting up, manipulating, and using solid-state storage devices
- Installing and configuring a bootloader for the target
- Cross-compiling a slew of utilities and packages
- Debugging your embedded system using a plethora of tools and techniques

Details are provided for various target architectures and hardware configurations, including a thorough review of Linux's support for embedded hardware. All explanations rely on the use of open source and free software packages. By presenting how to build the operating system components from pristine sources and how to find more documentation or help, this book greatly simplifies the task of keeping complete control over one's embedded operating system, whether it be for technical or sound financial reasons. Author Karim Yaghmour, a well-known designer and speaker who is responsible for the Linux Trace Toolkit, starts by discussing the strengths and weaknesses of Linux as an embedded operating system. Licensing issues are included, followed by a discussion of the basics of building embedded Linux systems. The configuration, setup, and use of over forty different open source and free software packages commonly used in embedded Linux systems are also covered. uClibc, BusyBox, U-Boot, OpenSSH, tftpd, tftp, strace, and gdb are among the packages discussed.

There are more than one billion Android devices in use today, each one a potential target. Unfortunately, many fundamental Android security features have been little more than a black box to all but the most elite security professionals—until now. In Android Security Internals, top Android security expert Nikolay Elenkov takes us under the hood of the Android security system. Elenkov describes Android security architecture from the bottom up, delving into the implementation of major security-related components and subsystems, like Binder IPC, permissions, cryptographic providers, and device administration. You'll learn: –How Android permissions are declared, used, and enforced –How Android manages application packages and employs code signing to

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verify their authenticity –How Android implements the Java Cryptography Architecture (JCA) and Java Secure Socket Extension (JSSE) frameworks –About Android’s credential storage system and APIs, which let applications store cryptographic keys securely –About the online account management framework and how Google accounts integrate with Android –About the implementation of verified boot, disk encryption, lockscreen, and other device security features –How Android’s bootloader and recovery OS are used to perform full system updates, and how to obtain root access With its unprecedented level of depth and detail, Android Security Internals is a must-have for any security-minded Android developer.

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