

O'REILLY®

2nd Edition

Embedded Android

PORTING, EXTENDING,
AND CUSTOMIZING



Karim Yaghmour

Embedded Android Porting Extending And Customizing Karim Yaghmour

Changyi Gu



Embedded Android Porting Extending And Customizing Karim Yaghmour:

Embedded Android Karim Yaghmour,2013-03-15 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 **Building Embedded Systems** Changyi Gu,2016-05-26 Develop the software and hardware you never think about We re talking about the nitty gritty behind the buttons on your microwave inside your thermostat inside the keyboard used to type this description and even running the monitor on which you are reading it now Such stuff is termed embedded systems and this book shows how to design and develop embedded systems at a professional level Because yes many people quietly make a successful career doing just that Building embedded systems can be both fun and intimidating Putting together an embedded system requires skill sets from multiple engineering disciplines from software and hardware in particular Building Embedded Systems is a book about helping you do things in the right way from the beginning of your first project Programmers who know software will learn what they need to know about hardware Engineers with hardware knowledge likewise will learn about the software side Whatever your background is Building Embedded Systems is the perfect book to fill in any knowledge gaps and get you started in a career programming for everyday devices Author Changyi Gu brings more than fifteen years of experience in working his way up the ladder in the field of embedded systems He brings knowledge of numerous approaches to embedded systems design including the System on Programmable Chips SOPC approach that is currently growing to dominate the field His knowledge and experience make Building Embedded Systems an excellent book for anyone wanting to enter the field or even just to do some embedded programming as a side project What You Will Learn Program embedded systems at the hardware level Learn current industry practices in firmware development Develop practical knowledge of embedded hardware options Create tight integration between software and hardware Practice a work flow leading to successful outcomes Build from transistor level to the system level Make sound choices between performance and cost Who This Book Is For Embedded system engineers and intermediate electronics enthusiasts who are seeking tighter integration between software and hardware Those who favor the System on a Programmable Chip SOPC approach will in particular benefit from this book Students in both Electrical Engineering and Computer Science can also benefit from this book and the real life industry practice it provides [Linux Kernel Networking](#) Rami Rosen,2013-12-22 A complete in depth reference guide to understanding kernel networking **Learning Embedded Android N Programming** Ivan Morgillo,Stefano Viola,2016-07-29 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.

Android System Programming Roger Ye, 2017-05-31

Build, customize and debug your own Android system

Key Features

- 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

Book Description

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.

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

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 *Embedded Programming with Android* Roger Ye, 2015-08-01 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 **Inside the Android OS** G. Blake Meike, Lawrence Schiefer, 2021-08-24 The Complete Guide to Customizing Android for New IoT and Embedded Devices Inside the Android OS is a comprehensive guide and reference for technical professionals who want to customize and integrate Android into embedded devices and construct or maintain successful Android based products Replete with code examples it encourages you to create your own working code as you read whether for personal insight or a professional project in the fast growing marketplace for smart IoT devices Expert Android developers G Blake Meike and Larry Schiefer respond to the real world needs of embedded and IoT developers moving to Android After presenting an accessible introduction to the Android environment they guide you through boot subsystem startup hardware interfaces and application support offering essential knowledge without ever becoming obscure or overly specialized Reflecting Android s continuing evolution Meike and Schiefer help you take advantage of relevant innovations from the ART application runtime environment to Project Treble Throughout a book length project covers all you need to start implementing your own custom Android devices one step at a

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Pro Android Appliances Wallace Jackson, 2015-09-26 *Pro Android Appliances* is a book detailing how to design and build Android apps for new and unique Android device types like HDR camera phones car dashboards 4K TVs other smart or connected TVs presentation support second screen or screen sharing support game console other non mainstream non standard Android based consumer electronics and other embedded hardware appliances that are now emerging It s time to take your Android apps development skills and experience to the next level and get exposure to a whole new world of hardware appliances game consoles smart TVs smart cameras smart cars and more This means more revenue earning opportunity for today s indie app developers This book covers the plethora of new Android 3 4 hardware support features which support new device types including the Presentation class Bluetooth Smart XXXHDPI 4K support MiraCast AllShareCast NFC Daydream PhotoSphere and existing features applicable to new device development Moreover this book provides new media design concepts which relate to using media assets such as imagery animation audio 3D and video as well as how to optimize applications for low power single core or dual core CPUs using the latest Eclipse Android 4 x IDE and the Android Device Emulators for popular new devices

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