



Android Hardware Interfacing with the BeagleBone Black

By Andrew Henderson, Aravind Prakash

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Android Hardware Interfacing with the BeagleBone Black By Andrew Henderson, Aravind Prakash

Design and implement Android apps that interface with your own custom hardware circuits and the BeagleBone Black

About This Book

- Design custom apps that interact with the outside world via BeagleBone Black
- Modify Android to recognize, configure, and communicate with sensors, LEDs, memory, and more
- A step-by-step guide full of practical Android app examples that will help the users to create Android controlled devices that will use BeagleBone as hardware

Who This Book Is For

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.

What You Will Learn

- Install Android on your BeagleBone Black
- Explore the three primary hardware interfaces of the BeagleBone Black—GPIO, SPI, and I2C
- Construct circuits that interface the BeagleBone Black with high-speed sensors, external memory chips, and more
- Discover the advantages and disadvantages of using GPIO, I2C, and SPI components in your interfacing projects
- Modify Android to recognize and interface with your own custom and prototype hardware
- Develop multithreaded apps that communicate directly with custom circuitry

In Detail

This book explores using the Android OS on the BeagleBone Black hardware platform and provides an introduction to Android's unique approach to hardware interfacing. You'll be walked through the process of installing and configuring Android on your BeagleBone Black, as well as preparing your PC development environment to create Android applications that directly interface with hardware devices. Several example projects within this book introduce you to using the GPIO, SPI, and I2C hardware interfaces of the BeagleBone Black.

You'll create Android apps that communicate directly with actual hardware components such as sensors, memory chips, switches, and LEDs. Step-by-step guidance through both the software and hardware portions of these projects is provided. Combining all of the previous projects into a single project that uses GPIO, SPI, and I2C together, you will explore the details of creating an advanced hardware interfacing app. Finally, you'll be provided with information on transitioning prototype code into code suitable for deployment on an Android-based device. With a variety of example apps that demonstrate key hardware communication concepts, this book will help you become an Android hardware interfacing pro in no time.

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Editorial Review

About the Author

Andrew Henderson

Andrew Henderson has over 15 years of experience developing software for the Linux desktop and embedded Linux and Android systems. He is currently a PhD candidate at Syracuse University, with research interests in the areas of system security and dynamic analysis. He maintains multiple open source projects for the BeagleBoard and BeagleBone platforms.

Aravind Prakash

Aravind Prakash is a PhD candidate at Syracuse University. His interests lie in system and mobile security, with emphasis on program analysis. He has published in multiple top-tier computer-security conferences. He brings with him over a decade of programming experience from companies such as Microsoft, McAfee, and FireEye.

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