

Getting Started With Beaglebone Linux Powered Electronic Projects With Python And Javascript By Matt Richardson 2013 10 18

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Getting Started With Beaglebone Linux Powered Electronic Projects With Python And Javascript By Matt Richardson 2013 10 18

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KATELYN GUNNER

BeagleBone Black Programming by Example Morgan & Claypool Publishers

In-depth instruction and practical techniques for building with the BeagleBone embedded Linux platform Exploring BeagleBone is a hands-on guide to bringing gadgets, gizmos, and robots to life using the popular BeagleBone embedded Linux platform. Comprehensive content and deep detail provide more than just a BeagleBone instruction manual—you'll also learn the underlying engineering techniques that will allow you to create your own projects. The book begins with a foundational primer on essential skills, and then gradually moves into communication, control, and advanced applications using C/C++, allowing you to learn at your own pace. In addition, the book's companion website features instructional videos, source code, discussion forums, and more, to ensure that you have everything you need. The BeagleBone's small size, high performance, low cost, and extreme adaptability have made it a favorite development platform, and the Linux software base allows for complex yet flexible functionality. The BeagleBone has applications in smart buildings, robot control, environmental sensing, to name a few; and, expansion boards and peripherals dramatically increase the possibilities. Exploring BeagleBone provides a reader-friendly guide to the device, including a crash course in computer engineering. While following step by step, you can: Get up to speed on embedded Linux, electronics, and programming Master interfacing electronic circuits, buses and modules, with practical examples Explore the Internet-connected BeagleBone and the BeagleBone with a display Apply the BeagleBone to sensing applications, including video and sound Explore the BeagleBone's Programmable Real-Time Controllers Hands-on learning helps ensure that your new skills stay with you, allowing you to design with electronics, modules, or peripherals even beyond the BeagleBone. Insightful guidance and online peer support help you transition from beginner to expert as you master the techniques presented in Exploring BeagleBone, the practical handbook for the popular computing platform.

Getting Started with Raspberry Pi Packt Publishing Ltd

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.

Crafting Electronic Systems with BeagleBone Black, Second Edition Packt Publishing Ltd

Getting Started with the Intel Galileo gets you up and running with this new, x86-powered board that was developed in collaboration between Arduino and Intel. You'll learn how to set it up, connect it to your computer, and begin programming. You'll learn how to build electronics projects around the Galileo, and you'll explore the features and power that make it different from all the boards that came before. Developed in collaboration with the Intel Galileo team, and in consultation with members of the Arduino team, this is the definitive introduction to Intel's new board for makers.

Electronic Projects with the Quark-Powered Arduino-Compatible Board Morgan & Claypool Publishers

Optimize and boost your Linux-based system with Yocto Project and increase its reliability and robustness efficiently and cost-effectively. About This Book * Optimize your Yocto Project tools to develop efficient Linux-based projects * Practical approach to learning Linux development using Yocto Project * Demonstrates concepts in a practical and easy-to-understand way Who This Book Is For If you are an embedded Linux developer with a basic knowledge of Yocto Project and want to broaden your knowledge with examples of embedded development, then this book is for you. This book is also for professionals who want to find new insights into working methodologies for Linux development. What You Will Learn * Understand the basic concepts involved in Poky workflows along with configuring and preparing the Poky build environment. * Configure a build server and customize images using Toaster. * Generate images and fit packages into created images using BitBake. * Support the development process by setting up and using Package feeds. * Debug Yocto Project by configuring Poky. * Build an image for the BeagleBone Black, RaspberryPi 3, and Wandboard, and boot it from an SD card. In Detail Yocto Project is turning out to be the best integration framework for creating reliable embedded Linux projects. It has the edge over other frameworks because of its features such as less development time and improved reliability and robustness. Embedded Linux Development using Yocto Project starts with an in-depth explanation of all Yocto Project tools, to help you perform different Linux-based tasks. The

book then moves on to in-depth explanations of Poky and BitBake. It also includes some practical use cases for building a Linux subsystem project using Yocto Project tools available for embedded Linux. The book also covers topics such as SDK, recipe tool, and others. By the end of the book, you will have learned how to generate and run an image for real hardware boards and will have gained hands-on experience at building efficient Linux systems using Yocto Project. Style and approach A clear, concise, and straightforward book that will enable you to use and implement the latest features of Yocto Project.

The BeagleBone Black Primer Maker Media, Inc.

If you want a simple guide to building complex robots, then this book is for you. You'll need some programming knowledge and experience working with mechanical systems.

Getting Started with Raspberry Pi Maker Media, Inc.

The Raspberry Pi is a credit card-sized computer that plugs into your TV and a keyboard. It is a capable little computer which can be used in electronics projects, and for many of the things that your desktop PC does, like spreadsheets, word processing, browsing the internet, and playing games. It also plays high-definition video. This book takes you step-by-step through many fun and educational possibilities. Take advantage of several preloaded programming languages. Use the Raspberry Pi with Arduino. Create Internet-connected projects. Play with multimedia. With Raspberry Pi, you can do all of this and more.

BeagleBone for Secret Agents Apress

BUILD YOUR OWN REMOTE-CONTROLLED AIRPLANES QUICKLY, EASILY, AND INEXPENSIVELY! Take to the skies with a majestic motorized model aircraft you create and pilot yourself. Written by the founder of the Brooklyn Aerodrome, *DIY RC Airplanes from Scratch* shows you how to build a Flack (Flying + Hack) delta wing from the ground up using widely available, low-cost materials and tools. You'll also learn the skills you need to get your plane into the air and keep it there. By the end of the book, you'll be able to create your own customized designs. The sky's the limit! Discover how to: Select the components you'll need and get them at a low cost Build a sturdy deck and secure all of your airplane's electronics to it Construct the airframe with the proper trim and center of gravity Learn to fly--one crash at a time Diagnose and repair your airplane Decorate your aircraft for dazzling daytime flights Illuminate a night flyer with otherworldly effects Experiment with unique airframe shapes, including the Flying Heart, the Bat, and the Manta Ray Learn the basics of aerodynamics Devise, build, and fly your own unique designs Companion videos available at <http://brooklynaerodrome.com/bible>

Linux-powered Electronic Projects with Python and JavaScript Packt Publishing Ltd

Getting Started with BeagleBone Linux-Powered Electronic Projects With Python and JavaScript Maker Media, Inc.

DIY RC Airplanes from Scratch Packt Publishing Ltd

The definitive, easy-to-use guide to the popular BeagleBone board BeagleBone For Dummies is the definitive beginner's guide to using the popular BeagleBone board to learn electronics and programming. Unlike other books that require previous knowledge of electronics, Linux, and Python, this one assumes you know nothing at all, and guides you step-by-step throughout the process of getting acquainted with your BeagleBone Original or BeagleBone Black. You'll learn how to get set up, use the software, build the hardware, and code your projects, with plenty of examples to walk you through the process. You'll move carefully through your first BeagleBone project, then get ideas for branching out from there to create even better, more advanced programs. The BeagleBone is a tiny computer board – about the size of a credit card – that has all the capability of a desktop. Its affordability and ease of use has made it popular among hobbyists, hardware enthusiasts, and programmers alike, and it's time for you to join their ranks as you officially dive into the world of microcomputers. This book removes the guesswork from using the popular BeagleBone board and shows you how to get up and running in no time. Download the operating system and connect your BeagleBone Learn to navigate the desktop environment Start programming with Python and Bonescript Build your first project, and find plans for many more To learn BeagleBone, you could spend hours on the Internet and still never find the information you need, or you can get everything you need here. This book appeals to all new and inexperienced hobbyists, tinkers, electronics gurus, hackers, budding programmers, engineers, and hardware geeks who want to learn how to get the most out of their powerful BeagleBone.

Measure the World with Electronics, Arduino, and Raspberry Pi John Wiley & Sons

The Raspberry Pi is a credit card-sized computer that plugs into your TV and a keyboard. It is a capable little computer which can be used in electronics projects, and for many of the things that your desktop PC does, like spreadsheets, word processing, browsing the internet, and playing games. It also plays high-definition video. This book takes you step-by-step through many fun and educational possibilities. Take advantage of several preloaded programming languages. Use the Raspberry Pi with Arduino. Create Internet-connected projects. Play with multimedia. With Raspberry Pi, you can do all of this and more.

Building a BeagleBone Black Super Cluster McGraw Hill Professional

If you are a programmer, scientist, or someone interested in modern computer technology that goes beyond the typical PC, then this book will show you the outstanding possibilities of cluster computing with modern embedded systems based on ARM architecture. Whether you need a high-speed or

low-cost scalable cluster for simulations or want to try something new, this book is the right guide for you.

Embedded Software for the IoT Getting Started with BeagleBoneLinux-Powered Electronic Projects With Python and JavaScript

Learn Raspberry Pi with Linux will tell you everything you need to know about the Raspberry Pi's GUI and command line so you can get started doing amazing things. You'll learn how to set up your new Raspberry Pi with a monitor, keyboard and mouse, and you'll discover that what may look unfamiliar in Linux is really very familiar. You'll find out how to connect to the internet, change your desktop settings, and you'll get a tour of installed applications. Next, you'll take your first steps toward being a Raspberry Pi expert by learning how to get around at the Linux command line. You'll learn about different shells, including the bash shell, and commands that will make you a true power user. Finally, you'll learn how to create your first Raspberry Pi projects: Making a Pi web server: run LAMP on your own network Making your Pi wireless: remove all the cables and retain all the functionality Making a Raspberry Pi-based security cam and messenger service: find out who's dropping by Making a Pi media center: stream videos and music from your Pi Raspberry Pi is awesome, and it's Linux. And it's awesome because it's Linux. But if you've never used Linux or worked at the Linux command line before, it can be a bit daunting. Raspberry Pi is an amazing little computer with tons of potential. And Learn Raspberry Pi with Linux can be your first step in unlocking that potential.

Learning BeagleBone Python Programming Packt Publishing Ltd

Many people think of Linux as a computer operating system, running on users' desktops and powering servers. But Linux can also be found inside many consumer electronics devices. Whether they're the brains of a cell phone, cable box, or exercise bike, embedded Linux systems blur the distinction between computer and device. Many makers love microcontroller platforms such as Arduino, but as the complexity increases in their projects, they need more power for applications, such as computer vision. The BeagleBone is an embedded Linux board for makers. It's got built-in networking, many inputs and outputs, and a fast processor to handle demanding tasks. This book introduces you to both the original BeagleBone and the new BeagleBone Black and gets you started with projects that take advantage of the board's processing power and its ability to interface with the outside world.

Bad to the Bone PE Press

Over 60 recipes and solutions for inventors, makers, and budding engineers to create projects using the BeagleBone Black About This Book Learn how to develop applications with the BeagleBone Black and open source Linux software Sharpen your expertise in making sophisticated electronic devices Explore the BeagleBone Black with this easy-to-succeed recipe format Who This Book Is For If you are a hardware, Linux, and/or microcomputing novice, or someone who wants more power and possibilities with product prototypes, electronic art projects, or embedded computing experiments, then this book is for you. It is for Internet of Things enthusiasts who want to use more sophisticated hardware than the Raspberry Pi or the Arduino can provide. Whether you are an engineering student, a DIYer, an inventor, or a budding electronics enthusiast, this book delivers accessible, easy-to-succeed instructions for using an advanced microcomputing platform. What You Will Learn Set up and run the BeagleBone Black for the first time Learn the basics of microcomputing and Linux using the command line and easy kernel mods Make introductory projects with Python, JavaScript, BoneScript, and Node.js Explore physical computing and simple circuits using buttons, LEDs, sensors, and motors Discover the unique features of the BeagleBone Black and its real-time computing functions Build intermediate level audio and video applications Assemble and add ingredients for creating Internet of Things prototypes In Detail There are many single-board controllers and computers such as Arduino, Udoo, or Raspberry Pi, which can be used to create electronic prototypes on circuit boards. However, when it comes to creating more advanced projects, BeagleBone Black provides a sophisticated alternative. Mastering the BeagleBone Black enables you to combine it with sensors and LEDs, add buttons, and marry it to a variety of add-on boards. You can transform this tiny device into the brain for an embedded application or an endless variety of electronic inventions and prototypes. With dozens of how-tos, this book kicks off with the basic steps for setting up and running the BeagleBone Black for the first time, from connecting the necessary hardware and using the command line with Linux commands to installing new software and controlling your system remotely. Following these recipes, more advanced examples take you through scripting, debugging, and working with software source files, eventually working with the Linux kernel. Subsequently, you will learn how to exploit the board's real-time functions. We will then discover exciting methods for using sound and video with the system before marching forward into an exploration of recipes for building Internet of Things projects. Finally, the book finishes with a dramatic arc upward into outer space, when you explore ways to build projects for tracking and monitoring satellites. Style and approach This comprehensive recipe book deconstructs a complex, often confusing piece of technology, and transforms it to become accessible and fun with snappy, unintimidating prose, and extensive easy-to-succeed instructions.

Programming the BeagleBone Walter de Gruyter GmbH & Co KG

JavaScript Robotics is on the rise. Rick Waldron, the lead author of this book and creator of the Johnny-Five platform, is at the forefront of this movement. Johnny-Five is an open source JavaScript Arduino programming framework for robotics. This book brings together fifteen innovative programmers, each creating a unique Johnny-Five robot step-by-step, and offering tips and tricks along the way. Experience with JavaScript is a prerequisite.

Crafting Electronic Systems with BeagleBone and BeagleBone Black Elsevier

Develop practical example projects with detailed explanations; combine the projects in a vast number of ways to create different robot designs, or work through them in sequence to discover the full capability of the BeagleBone Black. This book is for anyone who is curious about using new, low-cost hardware to create robotic projects that have previously been the domain of research labs, major universities or Defence departments. Some programming experience would be useful, but if you know how to use a personal computer, you can use this book to construct far more complex systems than you would have thought possible.

Getting Started with BeagleBone Maker Media, Inc.

Master BeagleBone programming by doing simple electronics and Internet of Things projects About This Book Quickly develop electronics projects that interact with Internet applications using JavaScript and Python Learn about electronics components such as sensors and motors, and how to communicate with them by writing programs A step-by-step guide to explore the exciting world of BeagleBone—from connecting BeagleBone to doing

electronics projects and creating IoT applications Who This Book Is For If you want to learn programming on embedded systems with BeagleBone by doing simple electronics projects, this book is for you. This book is also helpful to BeagleBone owners who want to quickly implement small-scale home automation solutions. It is assumed that you have familiarity with C and Python programming. Some familiarity with electronics is helpful but not essential. What You Will Learn Connect your BeagleBone to a computer in different ways and get the Cloud9 IDE running to quick-start programming on the BeagleBone Get to know about BeagleBone extension pins such as GPIO and how to connect various electronics components with BeagleBone Read and write to various electronics components such as LED, Push-button, sensors, and motors Grasp in-depth theory on Analog, PWM, and BUS programming and the electronics components used in programs Handle data to and from various BUS supporting modules such as UART, I2C, and SPI using the Adafruit BBIO Python library Write real-life IoT applications in JavaScript and Python such as shooting an e-mail on overheat and controlling a servo motor remotely Make use of online free cloud services to store and analyze sensor data collected on the BeagleBone Discover what else can be done using the BeagleBone Get to grips with embedded system BUS communication In Detail The whole world is moving from desktop computers to smartphones and embedded systems. We are moving towards utilizing Internet of Things (IoT). An exponential rise in the demand for embedded systems and programming in the last few years is driving programmers to use embedded development boards such as Beaglebone. BeagleBone is an ultra-small, cost-effective computer that comes with a powerful hardware. It runs a full-fledged Debian Linux OS and provides numerous electronics solutions. BeagleBone is open source and comes with an Ethernet port, which allows you to deploy IoT projects without any additions to the board. It provides plenty of GPIO, Anlaog pins, and UART, I2C, SPI pins which makes it the right choice to perform electronics projects. This gives you all the benefits of Linux kernel such as multitasking, multiusers, and extensive device driver support. This allows you to do programming in many languages including high-level languages such as JavaScript and Python. This book aims to exploit the hardware and software capabilities of BeagleBone to create real-life electronics and IoT applications quickly. It is divided into two parts. The first part covers JavaScript programs. The second part provides electronics projects and IoT applications in Python. First, you will learn to use BeagleBone as tool to write useful applications on embedded systems. Starting with the basics needed to set up BeagleBone and the Cloud9 IDE, this book covers interfacing with various electronics components via simple programs. The electronics theory related to these components is then explained in depth before you use them in a program. Finally, the book helps you create some real-life IoT applications. Style and approach An easy-to-follow guide full of real-world electronics programs and quick troubleshooting tips using BeagleBone. All the required electronics concepts are explained in detail before using them in a program and all programs are explained in depth. Most of the theory is covered in the first part; while the second part gives you some quick programs.

Interfacing to the Real World with Embedded Linux John Wiley & Sons

BeagleBone is an inexpensive web server, Linux desktop, and electronics hub that includes all the tools you need to create your own projects—whether it's robotics, gaming, drones, or software-defined radio. If you're new to BeagleBone Black, or want to explore more of its capabilities, this cookbook provides scores of recipes for connecting and talking to the physical world with this credit-card-sized computer. All you need is minimal familiarity with computer programming and electronics. Each recipe includes clear and simple wiring diagrams and example code to get you started. If you don't know what BeagleBone Black is, you might decide to get one after scanning these recipes. Learn how to use BeagleBone to interact with the physical world Connect force, light, and distance sensors Spin servo motors, stepper motors, and DC motors Flash single LEDs, strings of LEDs, and matrices of LEDs Manage real-time input/output (I/O) Work at the Linux I/O level with shell commands, Python, and C Compile and install Linux kernels Work at a high level with JavaScript and the BoneScript library Expand BeagleBone's functionality by adding capes Explore the Internet of Things

30 BeagleBone Black Projects for the Evil Genius Packt Publishing Ltd

What can you do with the Raspberry Pi, a \$35 computer the size of a credit card? All sorts of things! If you're learning how to program, or looking to build new electronic projects, this hands-on guide will show you just how valuable this flexible little platform can be. This book takes you step-by-step through many fun and educational possibilities. Take advantage of several preloaded programming languages. Use the Raspberry Pi with Arduino. Create Internet-connected projects. Play with multimedia. With Raspberry Pi, you can do all of this and more. Get acquainted with hardware features on the Pi's board Learn enough Linux to move around the operating system Pick up the basics of Python and Scratch—and start programming Draw graphics, play sounds, and handle mouse events with the Pygame framework Use the Pi's input and output pins to do some hardware hacking Discover how Arduino and the Raspberry Pi complement each other Integrate USB webcams and other peripherals into your projects Create your own Pi-based web server with Python

BeagleBone For Dummies Que Publishing

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 perk, 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.