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Exploring Raspberry Pi - Derek Molloy 2016-06-09

Expand Raspberry Pi capabilities with fundamental engineering principles **Exploring Raspberry Pi** is the innovators guide to bringing Raspberry Pi to life. This book favors engineering principles over a 'recipe' approach to give you the skills you need to design and build your own projects. You'll understand the fundamental principles in a way that transfers to any type of electronics, electronic modules, or external peripherals, using a "learning by doing" approach that caters to both beginners and experts. The book begins with basic Linux and programming skills, and helps you stock your inventory with common parts and supplies. Next, you'll learn how to make parts work together to achieve the goals of your project, no matter what type of components you use. The companion website provides a full repository that structures all of the code and scripts, along with links to video tutorials and supplementary content that takes you deeper into your project. The Raspberry Pi's most famous feature is its adaptability. It can be used for thousands of electronic applications, and using the Linux OS expands the functionality even more. This book helps you get the most from your Raspberry Pi, but it also gives you the fundamental engineering skills you need to incorporate any electronics into any project. Develop the Linux and programming skills you need to build basic applications Build your inventory of parts so you can always "make it work" Understand interfacing, controlling, and communicating with almost any component Explore advanced applications with video, audio, real-world interactions, and more Be free to adapt and create with

Exploring Raspberry Pi.

Programming the Raspberry Pi: Getting Started with Python - Simon Monk 2012-11-23

Program your own Raspberry Pi projects Create innovative programs and fun games on your tiny yet powerful Raspberry Pi. In this book, electronics guru Simon Monk explains the basics of Raspberry Pi application development, while providing hands-on examples and ready-to-use scripts. See how to set up hardware and software, write and debug applications, create user-friendly interfaces, and control external electronics. Do-it-yourself projects include a hangman game, an LED clock, and a software-controlled roving robot. Boot up and configure your Raspberry Pi Navigate files, folders, and menus Create Python programs using the IDLE editor Work with strings, lists, and functions Use and write your own libraries, modules, and classes Add Web features to your programs Develop interactive games with Pygame Interface with devices through the GPIO port Build a Raspberry Pi Robot and LED Clock Build professional-quality GUIs using Tkinter

Raspberry Pi and AVR Projects - Cefn Hoile 2014-11-07

As an incredibly cheap, credit-card sized computer, the Raspberry Pi is breaking down barriers by encouraging people of all ages to experiment with code and build new systems and objects; and this book provides readers with inspiring and insightful examples to explore and build upon. Written for intermediate to seasoned Raspberry Pi users, this book explores four projects from around the world, explained by their makers. These projects cover five major categories in the digital maker space: music, light, games, home automation, and the Internet of Things.

[Arduino Project Handbook](#) - Mark Geddes 2016-06-01

Arduino Project Handbook is a beginner-friendly collection of electronics projects using the low-cost Arduino board. With just a handful of components, an Arduino, and a computer, you'll learn to build and program everything from light shows to arcade games to an ultrasonic security system. First you'll get set up with an introduction to the Arduino and valuable advice on tools and components. Then you can work through the book in order or just jump to projects that catch your eye. Each project includes simple instructions, colorful photos and circuit diagrams, and all necessary code. Arduino Project Handbook is a fast and fun way to get started with microcontrollers that's perfect for beginners, hobbyists, parents, and educators. Uses the Arduino Uno board.

Raspberry Pi for Secret Agents - Second Edition - Stefan Sjogelid 2015-01-27

This book is an easy-to-follow guide with practical examples in each chapter. Suitable for the novice and expert alike, each topic provides a fast and easy way to get started with exciting applications and also guides you through setting up the Raspberry Pi as a secret agent toolbox.

Controller Area Network Prototyping With Arduino - Wilfried Voss 2015-02-10

While the Arduino is not widely considered an industrial-strength solution, it provides, due to its low price and ease of programming, the perfect prototyping platform for all kinds of Controller Area Network (CAN) applications. This book, written by a leading expert on CAN technologies, guides the reader through the process of acquiring all necessary hardware and software components, the implementation of the CAN driver, and the implementation of programs (Arduino Sketches) to read, send, process, and display data from and to a CAN network. The collection of programming examples cumulates into a full-fledged USB-to-CAN Gateway communicating with a Windows/Linux PC. This book will enable you to achieve CAN functionality literally within only a few hours.

Raspberry Pi Computer Architecture Essentials - Andrew K. Dennis 2016-03-22

Explore Raspberry Pi's architecture through innovative and fun projects About This Book Explore Raspberry Pi 2's hardware through the Assembly, C/C++, and Python programming languages Experiment with connecting electronics up to your Raspberry Pi 2 and interacting with them through software Learn about the Raspberry Pi 2 architecture and Raspbian operating system through innovative projects Who This Book Is For Raspberry Pi Computer Architecture Essentials is for those who are new and those who are familiar with the Raspberry Pi. Each topic builds upon earlier ones to provide you with a guide to Raspberry Pi's architecture. From the novice to the expert, there is something for everyone. A basic knowledge of programming and Linux would be helpful but is not required. What You Will Learn Set up your Raspberry Pi 2 and learn about its hardware Write basic programs in Assembly Language to learn about the ARM architecture Use C and C++ to interact with electronic components Find out about the Python language and how to use it to build web applications Interact with third-party microcontrollers Experiment with graphics and audio programming Expand Raspberry Pi 2's storage mechanism by using external devices Discover Raspberry Pi 2's GPIO pins and how to interact with them In Detail With the release of the Raspberry Pi 2, a new series of the popular compact computer is available for you to build cheap, exciting projects and learn about programming. In this book, we explore Raspberry Pi 2's hardware through a number of projects in a variety of programming languages. We will start by exploring the various

hardware components in detail, which will provide a base for the programming projects and guide you through setting up the tools for Assembler, C/C++, and Python. We will then learn how to write multi-threaded applications and Raspberry Pi 2's multi-core processor. Moving on, you'll get hands on by expanding the storage options of the Raspberry Pi beyond the SD card and interacting with the graphics hardware. Furthermore, you will be introduced to the basics of sound programming while expanding upon your knowledge of Python to build a web server. Finally, you will learn to interact with the third-party microcontrollers. From writing your first Assembly Language application to programming graphics, this title guides you through the essentials. Style and approach This book takes a step-by-step approach to exploring Raspberry Pi's architecture through projects that build upon each other. Each project provides you with new information on how to interact with an aspect of the Raspberry Pi and Raspbian operating system, providing a well-rounded guide.

Raspberry Pi User Guide - Eben Upton 2016-08-29

Learn the Raspberry Pi 3 from the experts! Raspberry Pi User Guide, 4th Edition is the "unofficial official" guide to everything Raspberry Pi 3. Written by the Pi's creator and a leading Pi guru, this book goes straight to the source to bring you the ultimate Raspberry Pi 3 manual. This new fourth edition has been updated to cover the Raspberry Pi 3 board and software, with detailed discussion on its wide array of configurations, languages, and applications. You'll learn how to take full advantage of the mighty Pi's full capabilities, and then expand those capabilities even more with add-on technologies. You'll write productivity and multimedia programs, and learn flexible programming languages that allow you to shape your Raspberry Pi into whatever you want it to be. If you're ready to jump right in, this book gets you started with clear, step-by-step instruction from software installation to system customization. The Raspberry Pi's tremendous popularity has spawned an entire industry of add-ons, parts, hacks, ideas, and inventions. The movement is growing, and pushing the boundaries of possibility along with it—are you ready to be a part of it? This book is your ideal companion for claiming your piece of the Pi. Get all set up with software, and connect to other devices Understand Linux System Admin nomenclature and conventions Write your own programs using Python and Scratch Extend the Pi's capabilities with add-ons like Wi-Fi dongles, a touch screen, and more The credit-card sized Raspberry Pi has become a global phenomenon. Created by the Raspberry Pi Foundation to get kids interested in programming, this tiny computer kick-started a movement of tinkerers, thinkers, experimenters, and inventors. Where will your

Raspberry Pi 3 take you? The Raspberry Pi User Guide, 3rd Edition is your ultimate roadmap to discovery.

Controller Area Network - Konrad Etschberger 2001

Raspberry Pi Home Automation with Arduino - Second Edition - Andrew K. Dennis 2015-02-25

If you are new to the Raspberry Pi, the Arduino, or home automation and wish to develop some amazing projects using these tools, then this book is for you. Any experience in using the Raspberry Pi would be an added advantage.

Practical Node-RED Programming - Taiji Hagino 2021-03-22

Use a low-code programming approach to create event-driven applications from scratch by wiring together hardware devices, APIs, and online services
Key Features
Discover how you can automate the Internet of Things (IoT) without writing huge blocks of code
Learn how to wire together flows using a browser-based visual editor
Handle IoT data with little to no coding knowledge
Book Description
Node-RED is a free and open source flow-based programming tool used to handle IoT data that allows programmers of any level to interconnect physical I/O, cloud-based systems, databases, and APIs to build web applications without code. Practical Node-RED Programming is a comprehensive introduction for anyone looking to get up to speed with the Node-RED ecosystem in no time. Complete with hands-on tutorials, projects, and self-assessment questions, this easy-to-follow guide will help you to become well versed in the foundations of Node-RED. You'll learn how to use Node-RED to handle IoT data and build web applications without having to write complex code. Once you've covered the basics, you'll explore various visual programming techniques and find out how to make sample flows as you cover web development, IoT development, and cloud service connections, and finally build useful real-world applications. By the end of this book, you'll have learned how to use Node-RED to develop a real-world application from scratch, which can then be implemented in your business. What you will learn
Understand the history of Node-RED and why you need to learn a flow-based programming tool
Use Node-RED to build Node.js-based applications
Handle data for IoT devices using Node-RED flows
Explore advanced Node-RED features such as connecting repositories and customizing the flow editor
Find out what the MQTT protocol is and how it relates to Node-RED
Create and publish your own nodes and flows using the Node-RED library
Who this book is for
This Node-RED book is for web developers and IoT engineers with some background in JavaScript and Node.js. Although

not necessary, familiarity with the concepts of electronics will help you to make the most out of this book.

Raspberry Pi Cookbook - Simon Monk 2013-12-10

The world of Raspberry Pi is evolving quickly, with many new interface boards and software libraries becoming available all the time. In this cookbook, prolific hacker and author Simon Monk provides more than 200 practical recipes for running this tiny low-cost computer with Linux, programming it with Python, and hooking up sensors, motors, and other hardware—including Arduino. Make sure to check out 10 of the over 60 video recipes for this book at: <http://razzpisampler.oreilly.com/> You can purchase all recipes at:

Open-Source Lab - Joshua M. Pearce 2013-10-04

Open-Source Lab: How to Build Your Own Hardware and Reduce Scientific Research Costs details the development of the free and open-source hardware revolution. The combination of open-source 3D printing and microcontrollers running on free software enables scientists, engineers, and lab personnel in every discipline to develop powerful research tools at unprecedented low costs. After reading Open-Source Lab, you will be able to: Lower equipment costs by making your own hardware Build open-source hardware for scientific research Actively participate in a community in which scientific results are more easily replicated and cited Numerous examples of technologies and the open-source user and developer communities that support them Instructions on how to take advantage of digital design sharing Explanations of Arduinos and RepRaps for scientific use A detailed guide to open-source hardware licenses and basic principles of intellectual property

Learning for Adaptive and Reactive Robot Control - Aude Billard 2022-02-08

Methods by which robots can learn control laws that enable real-time reactivity using dynamical systems; with applications and exercises. This book presents a wealth of machine learning techniques to make the control of robots more flexible and safe when interacting with humans. It introduces a set of control laws that enable reactivity using dynamical systems, a widely used method for solving motion-planning problems in robotics. These control approaches can replan in milliseconds to adapt to new environmental constraints and offer safe and compliant control of forces in contact. The techniques offer theoretical advantages, including convergence to a goal, non-penetration of obstacles, and passivity. The coverage of learning begins with low-level control parameters and progresses to higher-level competencies composed of combinations of skills. Learning for Adaptive and Reactive Robot Control is designed for graduate-level courses in robotics, with chapters that proceed from fundamentals to more advanced content. Techniques

covered include learning from demonstration, optimization, and reinforcement learning, and using dynamical systems in learning control laws, trajectory planning, and methods for compliant and force control . Features for teaching in each chapter: • applications, which range from arm manipulators to whole-body control of humanoid robots; • pencil-and-paper and programming exercises; • lecture videos, slides, and MATLAB code examples available on the author’s website . • an eTextbook platform website offering protected material[EPS2] for instructors including solutions.

Human Factors and Wearable Technologies - Tareq Z. Ahram and Christianne S. Falcão 2022-07-24

Human Factors and Wearable Technologies Proceedings of the 13th International Conference on Applied Human Factors and Ergonomics (AHFE 2022), July 24–28, 2022, New York, USA

Service Oriented, Holonic and Multi-agent Manufacturing Systems for Industry of the Future - Theodor Borangiu 2019-08-02

This proceedings book presents selected peer-reviewed papers from the 9th International Workshop on ‘Service Oriented, Holonic and Multi-agent Manufacturing Systems for the Industry of the Future’ organized by Universitat Politècnica de València, Spain, and held on October 3–4, 2019. The SOHOMA 2019 Workshop aimed to foster innovation in the digital transformation of manufacturing and logistics by promoting new concepts and methods and solutions through service orientation in holonic and agent-based control with distributed intelligence. The book provides insights into the theme of the SOHOMA’19 Workshop – ‘Smart anything everywhere – the vertical and horizontal manufacturing integration,’ addressing ‘Industry of the Future’ (IoF), a term used to describe the 4th industrial revolution initiated by a new generation of adaptive, fully connected, analytical and highly efficient robotized manufacturing systems. This global IoF model describes a new stage of manufacturing, that is fully automatized and uses advanced information, communication and control technologies such as industrial IoT, cyber-physical production systems, cloud manufacturing, resource virtualization, product intelligence, and digital twin, edge and fog computing. It presents the IoF interconnection of distributed manufacturing entities using a ‘system-of-systems’ approach, discussing new types of highly interconnected and self-organizing production resources in the entire value chain; and new types of intelligent decision-making support based on from real-time production data collected from resources, products and machine learning processing. This book is intended for researchers and engineers working in the manufacturing value chain, and specialists developing computer-based control and robotics solutions for the ‘Industry of the Future’. It is

also a valuable resource for master's and Ph.D. students in engineering sciences programs.

Raspberry Pi Cookbook - Simon Monk 2016-05-18

"The world of Raspberry Pi is evolving quickly, with many new interface boards and software libraries becoming available all the time. In this cookbook, prolific hacker and author Simon Monk provides more than 200 practical recipes for running this tiny low-cost computer with Linux, programming it with Python, and hooking up sensors, motors and other hardware—including Arduino. You'll also learn basic principles to help you use new technologies with Raspberry Pi as its ecosystem develops. Python and other code examples from the book are available on GitHub. This cookbook is ideal for programmers and hobbyists familiar with the Pi through resources such as *Getting Started with Raspberry Pi* (O'Reilly)."

Electrical and Electronic Devices, Circuits, and Materials - Suman Lata Tripathi 2021-03-24

The increasing demand for electronic devices for private and industrial purposes lead designers and researchers to explore new electronic devices and circuits that can perform several tasks efficiently with low IC area and low power consumption. In addition, the increasing demand for portable devices intensifies the call from industry to design sensor elements, an efficient storage cell, and large capacity memory elements. Several industry-related issues have also forced a redesign of basic electronic components for certain specific applications. The researchers, designers, and students working in the area of electronic devices, circuits, and materials sometimes need standard examples with certain specifications. This breakthrough work presents this knowledge of standard electronic device and circuit design analysis, including advanced technologies and materials. This outstanding new volume presents the basic concepts and fundamentals behind devices, circuits, and systems. It is a valuable reference for the veteran engineer and a learning tool for the student, the practicing engineer, or an engineer from another field crossing over into electrical engineering. It is a must-have for any library.

A Comprehensible Guide to Controller Area Network - Wilfried Voss 2008

Controller Area Network (CAN) is a serial network technology that was originally designed for the automotive industry, but has also become a popular bus in industrial automation. The CAN bus is primarily used in embedded solutions and provides communication among microprocessors up to real-time requirements. A Comprehensible Guide To Controller Area Network represents a very thoroughly researched and complete work on CAN. It provides information on all CAN features and aspects combined with high level of readability. Book jacket.

Emerging Trends in Mechatronics - Aydin Azizi 2020-01-15

Mechatronics is a multidisciplinary branch of engineering combining mechanical, electrical and electronics, control and automation, and computer engineering fields. The main research task of mechatronics is design, control, and optimization of advanced devices, products, and hybrid systems utilizing the concepts found in all these fields. The purpose of this special issue is to help better understand how mechatronics will impact on the practice and research of developing advanced techniques to model, control, and optimize complex systems. The special issue presents recent advances in mechatronics and related technologies. The selected topics give an overview of the state of the art and present new research results and prospects for the future development of the interdisciplinary field of mechatronic systems.

Factories of the Future: Manager's Guide to Industry 4.0 - Can Baran Ünal 2022-05-04

The manufacturing world is undergoing a massive digital transformation. Smart and connected infrastructures powered by artificial intelligence are bringing about yet another industrial revolution. Data based innovation is creating unprecedented opportunities for optimizing processes and gaining competitive advantage through new business models. In this book, we follow the magnificent story of the first three industrial revolutions in the tracks of great scientists, engineers and industrialists of yesterday, all the way up to cyber physical systems that will redefine the manufacturing value chain. Smart manufacturing revolution is rebuilding the factory from the ground up, changing old ways of doing business. Join me on this journey where we cover all the basic concepts and enabling technologies, then move on to formulate viable strategies on the path to Industry 4.0; for creating the Factories of the Future.

A Comprehensible Guide to J1939 - Wilfried Voss 2008

SAE J1939 has become the accepted industry standard and the vehicle network technology of choice for off-highway machines. This resource provides profound information on the J1939 message format and network management.

Raspberry Pi Pico DIY Workshop - Sai Yamanoor 2022-05-26

Take your first steps with the Raspberry Pi Pico and take on exciting projects using CircuitPython, MicroPython, and Pico Key Features Make the most of the Raspberry Pi Pico—a low-cost microcontroller that is primed for innovation Work with easy-to-follow examples and learn how to interface and program a Raspberry Pi Pico Work on fun projects, right from home automation to building a seven-segment display to tracking air quality Book Description The Raspberry Pi Pico is the latest addition to the Raspberry Pi

family of products. Introduced by the Raspberry Pi Foundation, based on their RP2040 chip, it is a tiny, fast microcontroller that packs enough punch to power an extensive range of applications. Raspberry Pi Pico DIY Workshop will help you get started with your own Pico and leverage its features to develop innovative products. This book begins with an introduction to the Raspberry Pi Pico, giving you a thorough understanding of the RP2040's peripherals and different development boards for the Pico designed and manufactured by various organizations. You'll explore add-on hardware and programming language options available for the Pico. Next, you'll focus on practical skills, starting with a simple LED blinking project and building up to a giant seven-segment display, while working with application examples such as citizen science displays, digital health, and robots. You'll also work on exciting projects around gardening, building a weather station, tracking air quality, hacking your personal health, and building a robot, along with discovering tips and tricks to give you the confidence needed to make the best use of RP2040. By the end of this Raspberry Pi book, you'll have built a solid foundation in product development using the RP2040, acquired a skillset crucial for embedded device development, and have a robot that you built yourself. What you will learn

Understand the RP2040's peripherals and apply them in the real world
Find out about the programming languages that can be used to program the RP2040
Delve into the applications of serial interfaces available on the Pico
Discover add-on hardware available for the RP2040
Explore different development board variants for the Raspberry Pi Pico
Discover tips and tricks for seamless product development with the Pico

Who this book is for This book is for students, teachers, engineers, scientists, artists, and tech enthusiasts who want to develop embedded systems that drive cost-effective automation, IoT, robotics, medical devices, and art projects. If you consider yourself a maker and would like to learn how to use the Raspberry Pi Pico, then this book is for you. Familiarity with Python programming, MicroPython, CircuitPython, embedded hardware, and peripherals is helpful but not mandatory to get the most out of this book.

Raspberry Pi Zero W Wireless Projects - Vasilis Tzivaras 2017-08-28

Build DIY wireless projects using the Raspberry Pi Zero W board

About This Book Explore the functionalities of the Raspberry Pi Zero W with exciting projects Master the wireless features (and extend the use cases) of this \$10 chip A project-based guide that will teach you to build simple yet exciting projects using the Raspberry Pi Zero W board

Who This Book Is For If you are a hobbyist or an enthusiast and want to get your hands on the latest Raspberry Pi Zero W to build exciting wireless

projects, then this book is for you. Some prior programming knowledge, with some experience in electronics, would be useful.

What You Will Learn

- Set up a router and connect Raspberry Pi Zero W to the internet
- Create a two-wheel mobile robot and control it from your Android device
- Build an automated home bot assistant device
- Host your personal website with the help of Raspberry Pi Zero W
- Connect Raspberry Pi Zero to speakers to play your favorite music
- Set up a web camera connected to the Raspberry Pi Zero W and add another security layer to your home automation

In Detail

The Raspberry Pi has always been the go-to, lightweight ARM-based computer. The recent launch of the Pi Zero W has not disappointed its audience with its \$10 release. "W" here stands for Wireless, denoting that the Raspberry Pi is solely focused on the recent trends for wireless tools and the relevant use cases. This is where our book—*Raspberry Pi Zero W Wireless Projects*—comes into its own. Each chapter will help you design and build a few DIY projects using the Raspberry Pi Zero W board. First, you will learn how to create a wireless decentralized chat service (client-client) using the Raspberry Pi's features?. Then you will make a simple two-wheel mobile robot and control it via your Android device over your local Wi-Fi network. Further, you will use the board to design a home bot that can be connected to plenty of devices in your home. The next two projects build a simple web streaming security layer using a web camera and portable speakers that will adjust the playlist according to your mood. You will also build a home server to host files and websites using the board. Towards the end, you will create free Alexa voice recognition software and an FPV Pi Camera, which can be used to monitor a system, watch a movie, spy on something, remotely control a drone, and more. By the end of this book, you will have developed the skills required to build exciting and complex projects with Raspberry Pi Zero W.

Style and approach

A step-by-step guide that will help you design and create simple yet exciting projects using the Raspberry Pi Zero W board.

Advanced Home Automation Using Raspberry Pi - Rishabh Jain 2021-10-08

Build a versatile home automation system from scratch. There are many ways of controlling home appliances with your smartphones, voice, gestures, etc. This book dives into the many options for communicating with appliances wirelessly and we'll discuss and implement the leading protocols in the field. In first few chapters, you will develop a basic understanding of the Raspberry Pi and how one can control it wirelessly from anywhere in the world. Then you'll get to know about the local server for your home automation projects and control the Raspberry Pi GPIOs using smartphone and web apps. Every

appliance will be able to talk to each other, as well, with the help of mesh networking, which you'll learn to implement. The user interface is also an important aspect of handling all the appliances, so you'll create your own user dashboard using OpenHAB. From there, you can monitor all the appliances and sensor data in one environment. Next, implement your own custom voice assistant to control your appliances and perform basic tasks like playing music, checking weather, etc. You'll also integrate a smart door bell into your system using image processing so that you can restrict an unknown person's entry. Finally, we'll combine all the knowledge that we have learned to make a fully versatile home automation project controlled using voice, gestures, and image processing. Throughout this whole project, Raspberry Pi will be your master server or node and other devices will be connected wirelessly using wi-fi/Bluetooth modules. Create a smart home with fully custom interfaces to do exactly what you need! What You'll Learn Create a user interface using openHAB Implement the MQTT protocol Install Alexa and Google Home API to control appliances wirelessly Who This Book Is For Enthusiasts with a working knowledge of the Raspberry Pi, electronic engineering, and Python programming. This book will also interest hobbyists and students from Computer Science or related disciplines.

Yocto for Raspberry Pi - Pierre-Jean Texier 2016-06-29

Create unique and amazing projects by using the powerful combination of Yocto and Raspberry Pi About This Book Set up and configure the Yocto Project efficiently with Raspberry Pi Deploy multimedia applications from existing Yocto/OE layers An easy-to-follow guide to utilize your custom recipes on your Raspberry Pi Who This Book Is For If you are a student or a developer of embedded software, embedded Linux engineer or embedded systems in competence with Raspberry Pi and want to discover the Yocto Project, then this book is for you. Experience with Yocto is not needed. What You Will Learn Explore the basic concept of Yocto's build system and how it is organized in order to use it efficiently with Raspberry Pi Generate your first image with Yocto for the Raspberry Pi Understand how to customize your Linux kernel within the Yocto Project Customize your image in order to integrate your own applications Write your own recipes for your graphical applications Integrate a custom layer for the Raspberry Pi In Detail The Yocto Project is a Linux Foundation workgroup, which produces tools (SDK) and processes (configuration, compilation, installation) that will enable the creation of Linux distributions for embedded software, independent of the architecture of embedded software (Raspberry Pi, i.MX6, and so on). It is a powerful build system that allows you to master your personal or professional development. This book

presents you with the configuration of the Yocto Framework for the Raspberry Pi, allowing you to create amazing and innovative projects using the Yocto/OpenEmbedded eco-system. It starts with the basic introduction of Yocto's build system, and takes you through the setup and deployment steps for Yocto. It then helps you to develop an understanding of Bitbake (the task scheduler), and learn how to create a basic recipe through a GPIO application example. You can then explore the different types of Yocto recipe elements (LICENSE, FILES, SRC_URI, and so on). Next, you will learn how to customize existing recipes in Yocto/OE layers and add layers to your custom environment (qt5 for example). Style and approach A step by step guide covering the fundamentals to create amazing new projects with Raspberry Pi and Yocto.

BeagleBone Robotic Projects - Richard Grimmett 2013-12-26

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.

Beginning Sensor Networks with Arduino and Raspberry Pi - Charles Bell 2014-01-23

Beginning Sensor Networks with Arduino and Raspberry Pi teaches you how to build sensor networks with Arduino, Raspberry Pi, and XBee radio modules, and even shows you how to turn your Raspberry Pi into a MySQL database server to store your sensor data! First you'll learn about the different types of sensors and sensor networks, including how to build a simple XBee network. Then you'll walk through building an Arduino-based temperature sensor and data collector, followed by building a Raspberry Pi-based sensor node. Next you'll learn different ways to store sensor data, including writing to an SD card, sending data to the cloud, and setting up a Raspberry Pi MySQL server to host your data. You even learn how to connect to and interact with a MySQL database server directly from an Arduino! Finally you'll learn how to put it all together by connecting your Arduino sensor node to your new Raspberry Pi database server. If you want to see how well Arduino and Raspberry Pi can get along, especially to create a sensor network, then Beginning Sensor Networks with Arduino and Raspberry Pi is just the book you need.

Exploring BeagleBone - Derek Molloy 2014-12-05

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.

Android Things Projects - Francesco Azzola 2017-06-30

Develop smart Internet of things projects using Android Things.

About This Book Learn to build promising IoT projects with Android Things Make the most out of hardware peripherals using standard Android APIs Build enticing projects on IoT, home automation, and robotics by leveraging Raspberry Pi 3 and Intel Edison

Who This Book Is For This book is for Android enthusiasts, hobbyists, IoT experts, and Android developers who want to gain a deeper knowledge of Android Things. The main focus is on implementing IoT projects using Android Things.

What You Will Learn Understand IoT ecosystem and the Android

Things role See the Android Things framework: installation, environment, SDK, and APIs See how to effectively use sensors (GPIO and I2C Bus) Integrate Android Things with IoT cloud platforms Create practical IoT projects using Android Things Integrate Android Things with other systems using standard IoT protocols Use Android Things in IoT projects In Detail Android Things makes developing connected embedded devices easy by providing the same Android development tools, best-in-class Android framework, and Google APIs that make developers successful on mobile. With this book, you will be able to take advantage of the new Android framework APIs to securely build projects using low-level components such as sensors, resistors, capacitors, and display controllers. This book will teach you all you need to know about working with Android Things through practical projects based on home automation, robotics, IoT, and so on. We'll teach you to make the most of the Android Things and build enticing projects such as a smart greenhouse that controls the climate and environment automatically. You'll also create an alarm system, integrate Android Things with IoT cloud platforms, and more. By the end of this book, you will know everything about Android Things, and you'll have built some very cool projects using the latest technology that is driving the adoption of IoT. You will also have primed your mindset so that you can use your knowledge for profitable, practical projects. Style and approach This book is packed with fun-filled, end-to-end projects that you will be encouraged to experiment on the Android Things OS.

[Beginning Programming with Python For Dummies](#) - John Paul Mueller 2018-02-13

The easy way to learn programming fundamentals with Python Python is a remarkably powerful and dynamic programming language that's used in a wide variety of application domains. Some of its key distinguishing features include a very clear, readable syntax, strong introspection capabilities, intuitive object orientation, and natural expression of procedural code. Plus, Python features full modularity, supporting hierarchical packages, exception-based error handling, and modules easily written in C, C++, Java, R, or .NET languages, such as C#. In addition, Python supports a number of coding styles that include: functional, imperative, object-oriented, and procedural. Due to its ease of use and flexibility, Python is constantly growing in popularity—and now you can wear your programming hat with pride and join the ranks of the pros with the help of this guide. Inside, expert author John Paul Mueller gives a complete step-by-step overview of all there is to know about Python. From performing common and advanced tasks, to collecting data, to interacting with package—this book covers it all! Use Python to

create and run your first application Find out how to troubleshoot and fix errors Learn to work with Anaconda and use Magic Functions Benefit from completely updated and revised information since the last edition If you've never used Python or are new to programming in general, Beginning Programming with Python For Dummies is a helpful resource that will set you up for success.

Learn Azure in a Month of Lunches, Second Edition - Iain Foulds 2020-10-06

Learn Azure in a Month of Lunches, Second Edition, is a tutorial on writing, deploying, and running applications in Azure. In it, you'll work through 21 short lessons that give you real-world experience. Each lesson includes a hands-on lab so you can try out and lock in your new skills. Summary You can be incredibly productive with Azure without mastering every feature, function, and service. Learn Azure in a Month of Lunches, Second Edition gets you up and running quickly, teaching you the most important concepts and tasks in 21 practical bite-sized lessons. As you explore the examples, exercises, and labs, you'll pick up valuable skills immediately and take your first steps to Azure mastery! This fully revised new edition covers core changes to the Azure UI, new Azure features, Azure containers, and the upgraded Azure Kubernetes Service. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Microsoft Azure is vast and powerful, offering virtual servers, application templates, and prebuilt services for everything from data storage to AI. To navigate it all, you need a trustworthy guide. In this book, Microsoft engineer and Azure trainer Iain Foulds focuses on core skills for creating cloud-based applications. About the book Learn Azure in a Month of Lunches, Second Edition, is a tutorial on writing, deploying, and running applications in Azure. In it, you'll work through 21 short lessons that give you real-world experience. Each lesson includes a hands-on lab so you can try out and lock in your new skills. What's inside Understanding Azure beyond point-and-click Securing applications and data Automating your environment Azure services for machine learning, containers, and more About the reader This book is for readers who can write and deploy simple web or client/server applications. About the author Iain Foulds is an engineer and senior content developer with Microsoft. Table of Contents PART 1 - AZURE CORE SERVICES 1 Before you begin 2 Creating a virtual machine 3 Azure Web Apps 4 Introduction to Azure Storage 5 Azure Networking basics PART 2 - HIGH AVAILABILITY AND SCALE 6 Azure Resource Manager 7 High availability and redundancy 8 Load-balancing applications 9 Applications that scale 10 Global databases with Cosmos DB 11 Managing network traffic and routing 12 Monitoring and troubleshooting PART 3 - SECURE BY DEFAULT 13

Backup, recovery, and replication 14 Data encryption 15 Securing information with Azure Key Vault 16 Azure Security Center and updates PART 4 - THE COOL STUFF 17 Machine learning and artificial intelligence 18 Azure Automation 19 Azure containers 20 Azure and the Internet of Things 21 Serverless computing

A Comprehensible Guide to Servo Motor Sizing - Wilfried Voss 2007-08

The Importance of servo motor sizing should not be underestimated. Proper motor sizing will not only result in significant cost savings by saving energy, reducing purchasing and operating costs, reducing downtime, etc.; it also helps the engineer to design better motion control systems. However, the knowledge of mechanical systems and their influence on motor speed, inertia and torque requirements seems to decline in a world where modern technology aspects, such as tuning and programming, seem to be the main focus. The motor sizing process involves a number of mathematical equations, which are most certainly documented, but not necessarily with the motor sizing process in mind. This book focuses primarily on servo motor sizing and it documents in detail the inertia and torque calculations of standard mechanical components and the motor selection process.

***Penetration Testing with Raspberry Pi* - Michael McPhee 2016-11-30**

Learn the art of building a low-cost, portable hacking arsenal using Raspberry Pi 3 and Kali Linux 2 About This Book Quickly turn your Raspberry Pi 3 into a low-cost hacking tool using Kali Linux 2 Protect your confidential data by deftly preventing various network security attacks Use Raspberry Pi 3 as honeypots to warn you that hackers are on your wire Who This Book Is For If you are a computer enthusiast who wants to learn advanced hacking techniques using the Raspberry Pi 3 as your pentesting toolbox, then this book is for you. Prior knowledge of networking and Linux would be an advantage. What You Will Learn Install and tune Kali Linux 2 on a Raspberry Pi 3 for hacking Learn how to store and offload pentest data from the Raspberry Pi 3 Plan and perform man-in-the-middle attacks and bypass advanced encryption techniques Compromise systems using various exploits and tools using Kali Linux 2 Bypass security defenses and remove data off a target network Develop a command and control system to manage remotely placed Raspberry Pis Turn a Raspberry Pi 3 into a honeypot to capture sensitive information In Detail This book will show you how to utilize the latest credit card sized Raspberry Pi 3 and create a portable, low-cost hacking tool using Kali Linux 2. You'll begin by installing and tuning Kali Linux 2 on Raspberry Pi 3 and then get started with penetration testing. You will be exposed to various network

security scenarios such as wireless security, scanning network packets in order to detect any issues in the network, and capturing sensitive data. You will also learn how to plan and perform various attacks such as man-in-the-middle, password cracking, bypassing SSL encryption, compromising systems using various toolkits, and many more. Finally, you'll see how to bypass security defenses and avoid detection, turn your Pi 3 into a honeypot, and develop a command and control system to manage a remotely-placed Raspberry Pi 3. By the end of this book you will be able to turn Raspberry Pi 3 into a hacking arsenal to leverage the most popular open source toolkit, Kali Linux 2.0. Style and approach This concise and fast-paced guide will ensure you get hands-on with penetration testing right from the start. You will quickly install the powerful Kali Linux 2 on your Raspberry Pi 3 and then learn how to use and conduct fundamental penetration techniques and attacks.

TinyML - Pete Warden 2019-12-16

Deep learning networks are getting smaller. Much smaller. The Google Assistant team can detect words with a model just 14 kilobytes in size—small enough to run on a microcontroller. With this practical book you'll enter the field of TinyML, where deep learning and embedded systems combine to make astounding things possible with tiny devices. Pete Warden and Daniel Situnayake explain how you can train models small enough to fit into any environment. Ideal for software and hardware developers who want to build embedded systems using machine learning, this guide walks you through creating a series of TinyML projects, step-by-step. No machine learning or microcontroller experience is necessary. Build a speech recognizer, a camera that detects people, and a magic wand that responds to gestures Work with Arduino and ultra-low-power microcontrollers Learn the essentials of ML and how to train your own models Train models to understand audio, image, and accelerometer data Explore TensorFlow Lite for Microcontrollers, Google's toolkit for TinyML Debug applications and provide safeguards for privacy and security Optimize latency, energy usage, and model and binary size

Raspberry Pi For Dummies - Sean McManus 2017-08-29

Get your slice of Raspberry Pi With the invention of the unique credit card-sized single-board computer comes a new wave of hardware geeks, hackers, and hobbyists who are excited about the possibilities with the Raspberry Pi—and this is the perfect guide to get you started. With this down-to-earth book, you'll quickly discover why the Raspberry Pi is in high demand! There's a reason the Raspberry Pi sold a million units in its first year, and you're about to find out why! In Raspberry Pi For Dummies, 3rd Edition veteran

tech authors Sean McManus and Mike Cook make it easier than ever to get you up and running on your Raspberry Pi, from setting it up, downloading the operating system, and using the desktop environment to editing photos, playing music and videos, and programming with Scratch—and everything in between. Covers connecting the Pi to other devices such as a keyboard, mouse, monitor, and more Teaches you basic Linux System Admin Explores creating simple hardware projects Shows you how to create web pages Raspberry Pi For Dummies, 3rd Edition makes computing as easy as pie!

Programming Robots with ROS - Morgan Quigley 2015-11-16

Chapter 3. Topics; Publishing to a Topic; Checking That Everything Works as Expected; Subscribing to a Topic; Checking That Everything Works as Expected; Latched Topics; Defining Your Own Message Types; Defining a New Message; Using Your New Message; When Should You Make a New Message Type?; Mixing Publishers and Subscribers; Summary; Chapter 4. Services; Defining a Service; Implementing a Service; Checking That Everything Works as Expected; Other Ways of Returning Values from a Service; Using a Service; Checking That Everything Works as Expected; Other Ways to Call Services; Summary.

Sae J1939 ECU Programming & Vehicle Bus Simulation with Arduino - Wilfried Voss 2015-03-23

This book, written by a leading expert in the field of Controller Area Network (CAN) technologies, represents the perfect guide to implementing an SAE J1939 protocol stack for embedded systems. The book is filled with numerous C/C++ code examples and valuable documentation of the resulting J1939 vehicle network data traffic. It explains in great detail the inner workings of the protocol through designing and transmitting J1939 data frames, receiving and processing J1939 data frames, and simulating J1939 ECUs (Electronic Control Units). Other Arduino sketches (software projects) include a J1939 network scanner, and a simple SAE J1939 to USB Gateway application with associated Windows GUI (Visual Studio C# project). The collection of sketches is concluded by the ARD1939 project, a fully functional SAE J1939 protocol stack for the Arduino Uno and Mega 2560. As an added value, the included proof of concept explains (by means of code examples and bus traffic recordings) the details of the Transport Protocol (TP) according to SAE J1939/21 (BAM Session, RTS/CTS Session) and the Address Claim Procedure according to SAE J1939/81. In combination with the low-cost and high-level user-friendliness approach of the Arduino environment, this book represents the ideal platform to learning and implementing embedded applications with the SAE J1939 protocol stack.

Z-Wave Essentials - Christian Paetz 2017-06-10

Z-Wave is the leading international standard for wireless communication in Smart Homes. Different products from different vendors work together and interoperate in one single network to provide intelligent lighting, safety, security and energy efficiency. This book describes all you need to know about Z-Wave: The radio layer standardized by the international ITU organization, the networking between the device to realize a stable communication and finally the device specific application functions that ensure the interoperability between the different devices. Practical guidance for the installation and trouble shooting of wireless networks is provided as well.

Python Programming for Arduino - Pratik Desai 2015-02-27

This is the book for you if you are a student, hobbyist, developer, or designer with little or no programming and hardware prototyping experience, and you want to develop IoT applications. If you are a software developer or a hardware designer and want to create connected devices applications, then this book will help you get started.