

## Make Bluetooth Bluetooth Le Projects With Arduino Raspberry Pi And Smartphones

Use the power of BLE to create exciting IoT applications About This Book Build hands-on IoT projects using Bluetooth Low Energy and learn about Bluetooth 5 and its features. Build a health tracking system, and indoor navigation and warehouse weather monitoring projects using smart devices. Build on a theoretical foundation and create a practice-based understanding of Bluetooth Low Energy. Who This Book Is For If you're an application developer, a hardware enthusiast, or just curious about the Internet of Things and how to convert it into hands-on projects, then this book is for you. Having some knowledge of writing mobile applications will be advantageous. What You Will Learn Learn about the architecture and IoT uses of BLE, and in which domains it is being used the most Set up and learn about various development platforms (Android, iOS, Firebase, Raspberry Pi, Beacons, and GitHub) Create an Explorer App (Android/iOS) to diagnose a Fitness Tracker Design a Beacon with the Raspberry Pi and write an app to detect the Beacon Write a mobile app to periodically poll the BLE tracking sensor Compose an app to read data periodically from temperature and humidity sensors Explore more applications of BLE with IoT Design projects for both Android and iOS mobile platforms In Detail Bluetooth Low Energy, or Bluetooth Smart, is Wireless Personal Area networking aimed at smart devices and IoT applications. BLE has been increasingly adopted by application developers and IoT enthusiasts to establish connections between smart devices. This book initially covers all the required aspects of BLE, before you start working on IoT projects. In the initial stages of the book, you will learn about the basic aspects of Bluetooth Low Energy—such as discovering devices, services, and characteristics—that will be helpful for advanced-level projects. This book will guide you through building hands-on projects using BLE and IoT. These projects include tracking health data, using a mobile App, and making this data available for health practitioners; Indoor navigation; creating beacons using the Raspberry Pi; and warehouse weather Monitoring. This book also covers aspects of Bluetooth 5 (the latest release) and its effect on each of these projects. By the end of this book, you will have hands-on experience of using Bluetooth Low Energy to integrate with smart devices and IoT projects. Style and Approach A practical guide that will help you promote yourself into an expert by building and exploring practical applications of Bluetooth Low Energy.

**Make: Sensors** is the definitive introduction and guide to the sometimes-tricky world of using sensors to monitor the physical world. With dozens of projects and experiments for you to build, this book shows you how to build sensor projects with both Arduino and Raspberry Pi. Use Arduino when you need a low-power, low-complexity brain for your sensor, and choose Raspberry Pi when you need to perform additional processing using the Linux operating system running on that device. You'll learn about touch sensors, light sensors, accelerometers, gyroscopes, magnetic sensors, as well as temperature, humidity, and gas sensors.

Learn the key standards—iBeacon, Eddystone, Bluetooth 4.0, and AltBeacon—and how they work with other proximity technologies. Then build your understanding of the proximity framework and how to identify and deploy the best solutions for your own business, institutional, or consulting needs. Proximity technology—in particular, Bluetooth beacons—is a major source of business opportunity, and this book provides everything you need to know to architect a solution to capitalize on that opportunity. What You'll Learn Understand the disruptive implications of digital–physical convergence and the new applications it makes possible Review the key standards that solutions developers need to understand to capitalize on the business opportunity of proximity technology Discover the new phenomenon of beacon networks, which will be hugely significant in driving strategic decisions and creating wealth See other technologies in the proximity ecosystem catalyzed by and complementary to Bluetooth beacons, including visual light communication, magnetic resonance, and RFID Examine the Beacosystem framework for analyzing the proximity ecosystem Who This Book Is For Solutions architects of all types—venture capitalists, founders, CEOs, strategists, product managers, CTOs, business developers, and programmers Stephen Statler is a writer, public speaker, and consultant working in the beacon ecosystem. He trains and advises retailers, venue owners, VCs, as well as makers of beacon software and hardware, and is a thought leader in the beacosystem community. Previously he was the Senior Director for Strategy and Solutions Management at Qualcomm's Retail Solutions Division, helping to incubate Gimbal, one of the leading Bluetooth beacons in the market. He is also the CEO of Cause Based Solutions, creators of Give the Change, democratizing philanthropy, enabling non-profit supporters to donate the change from charity branded debit cards, and developer of The Good Traveler program. Contributors: Anke Audenaert, CEO, Favrit John Coombs, CEO, Rover Labs Theresa Mary Gordon, Co-Founder, tapGOconnect Phil Hendrix, Director, immr Kris Kolodziej, President, IndoorLBS Patrick Leddy, CEO, Pulsate Ben Parker, VP Business Development, AccelerateIT Mario Proietti, CEO, Location Smart Ray Rotolo, SVP OOH, Gimbal Kjartan Slette, COO, Unacast Jarno Vanto, Partner, Borenus Attorneys LLP David Young, Chief Engineer, Radius Networks Foreword by Asif Khan, President LBMA

Explore how Bluetooth Low Energy (LE) has transformed the audio landscape, from music streaming to voice recognition applications. This book describes the rationale behind moving to LE audio, the potential power savings, and how various specifications need to be linked together to develop a final end product. LE Audio is a natural development of the Bluetooth audio standard. The standard is spread across more than a dozen different specifications, from application profiles, down to the core transports in both Host part and Controller part. You'll see how this new architecture of the Bluetooth audio stack defines a LE Audio stack from the Core Controller to the Host Protocols, and Profiles. You'll also learn how to free yourself from wires and charging. LE Audio introduces a new audio compression codec called LC3 (Low Complexity Communication Codec), which covers sampling rates for the full range of voice and media application at high fidelity, low complexity and low bit-rate and is ideal for new applications – such as voice assistance and gaming.

Unraveling Bluetooth Low Energy Audio provides full context to anyone who is curious to learn about the new LE Audio technology. What You'll Learn Understand the advantages of LE audio over current standards Describe the overall Bluetooth LE audio stack and its various blocks Enable LE audio with the Core Controller specification See how an end-to-end application works its through the LE audio ecosystem Examine how LE Audio addresses current and future trends in interoperable wireless audio Who This Book Is For The target audience for this book are developers, manufacturers, students, lecturers, teachers, technology geeks, platform integrators, and entrepreneurs.

Provides instructions for building thirty-three projects that interact with the physical world, including a stuffed monkey video game controller and a battery powered GPS that reports its location over Bluetooth.

The authors bring readers more of the practical tips and tricks that made the first edition a runaway hit. Completely revised and updated, this version includes over 30 new hacks, major overhauls of over 30 more, and timely adjustments and touch-ups to dozens of other hacks.

This book is a practical guide to programming Bluetooth Low Energy for Arduino 101. In this book, you will learn the basics of how to program an Arduino 101 to communicate with any Central or Peripheral device over Bluetooth Low Energy. Each chapter of the book builds on the previous one, culminating in three projects: - A Beacon and Scanner - An Echo Server and Client - A Remote Controlled Device Through the course of the book you will learn important concepts that relate to: - How Bluetooth Low Energy works - How data is sent and received - Common paradigms for handling data This book is excellent for anyone who has basic or advanced knowledge of Arduino programming or C++.

This do-it-yourself guide shows you how to program and build projects with the Arduino Uno and Leonardo boards and the Arduino 1.0 development environment. It gets you started right away with the simplified C programming you need to know and demonstrates how to take advantage of the latest Arduino capabilities. You'll learn how to attach an Arduino board to your computer, program it, and connect electronics to it to create your own devices. A bonus chapter uses the special USB keyboard/mouse-impersonation feature exclusive to the Arduino Leonardo--

Bluetooth Low Energy (LE) is one of the latest enhancement to Bluetooth technology and, as the name suggests, it is aimed at ultra low power devices, such as heart rate monitors, thermometers, and laboratory sensors. Due to very low power consumption, devices compliant with this standard can operate for months or even years on coin cell batteries without the need for recharging. This cutting-edge book helps you understand the whats, whys, and hows of Bluetooth LE. It includes a broad view of the technology, identifies the various building blocks and explains how they come together. The book explains the architecture of Bluetooth LE stack and the functionality provided by each of the layers. You find expert guidance in setting up your own system in a quick and efficient manner with inexpensive, easily available hardware and just a couple of PCs running Linux. Additionally, this practical volume features exercises and sample programs to help you get a first-hand feel for how the technology works.

This book is where your adventures with Bluetooth LE begin. You'll start your journey by getting familiar with your hardware options: Arduino, BLE modules, computers (including Raspberry Pi!), and mobile phones. From there, you'll write code and wire circuits to connect off-the-shelf sensors, and even go all the way to writing your own Bluetooth Services. Along the way you'll look at lightbulbs, locks, and Apple's iBeacon technology, as well as get an understanding of Bluetooth security--both how to beat other people's security, and how to make your hardware secure.

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This book is where your adventures with Bluetooth LE begin. You'll start your journey by getting familiar with your hardware options: Arduino, BLE modules, computers (including Raspberry Pi!), and mobile phones. From there, you'll write code and wire circuits to connect off-the-shelf sensors, and even go all the way to writing your own Bluetooth Services. Along the way you'll look at lightbulbs, locks, and Apple's iBeacon technology, as well as get an understanding of Bluetooth security-- both how to beat other people's security, and how to make your hardware secure.

The micro:bit, a tiny computer being distributed by the BBC to students all over the UK, is now available for anyone to purchase and play with. Its small size and low power requirements make it an ideal project platform for hobbyists and makers. You don't have to be limited by the web-based programming solutions, however: the hardware on the board is deceptively powerful, and this book will teach you how to really harness the power of the micro:bit. You'll learn about sensors, Bluetooth communications, and embedded operating systems, and along the way you'll develop an understanding of the next big thing in computers: the Internet of Things.

Add Bluetooth to your Robotic Projects! Michael Wright has done it again! This book takes the mystery out of using Bluetooth for your robotic projects. Learn how to use the Arduino to program the HC-05 and ZS-040 Bluetooth modules. Includes: Support website at [www.y2kLeader.com](http://www.y2kLeader.com) AT Programming Codes. Instructions for the HC-05 Bluetooth Module. Instructions for the ZS-040 Bluetooth Module. Wiring and Arduino Sketches. How to make voltage dividers. How to pair with other modules. How to pair with Android!

Learn how to use a Raspberry Pi in conjunction with an Arduino to build a basic robot with advanced capabilities. Getting started in robotics does not have to be difficult. This book is an insightful and rewarding introduction to robotics and a catalyst for further directed study. You'll be led step by step through the process of building a robot that uses the power of a Linux based computer paired with the simplicity of Arduino. You'll learn why the Raspberry Pi is a great choice for a robotics platform; its strengths as well as its shortcomings; how to overcome these limitations by implementing an Arduino; and the basics of the Python programming language as well as some of the more powerful features. With the Raspberry Pi you can give your project the power of a Linux computer, while Arduino makes interacting with sensors and motors very easy. These two boards are complimentary in their functions; where one falters the other performs admirably. The book also includes references to other great works to help further your growth in the exciting, and now accessible, field of smart robotics. As a bonus, the final chapter of the book demonstrates the real power of the Raspberry Pi by implementing a basic vision system. Using OpenCV and a standard USB web cam, you will build a robot that can chase a ball. What You'll Learn Install Raspbian, the operating system that drives the Raspberry Pi Drive motors through an I2C motor controller Read data through sensors attached to an Arduino Who This Book Is For Hobbyists and students looking for a rapid start in robotics. It assumes no technical background. Readers are guided to pursue the areas that interest them in more detail as they learn.

Discover and implement a system of your choice using Bluetooth Low Energy. About This Book Learn the basics of Bluetooth Low Energy with its exciting new protocol stack and security. Build customized Bluetooth Low Energy projects that make your web or mobile apps smarter in terms of networking and communications. Using Android, iOS, and the Web, acquire key skills to harness the power of Bluetooth Low

Energy in your IoT applications. Who This Book Is For The book is for developers and enthusiasts who are passionate about learning Bluetooth Low Energy technologies and want to add new features and services to their new or existing products. They should be familiar with programming languages such as Swift, Java, and JavaScript. Knowledge of debugging skills would be an advantage. What You Will Learn Bluetooth Low Energy in theory. Bluetooth Low Energy Hardware and Software Development Kits. Implement Bluetooth low energy communication (central and peripheral) using Android. Master BLE Beacons with examples implemented over Eddystone and iBeacons. Implement indoor navigation using Estimote Beacons on iOS. Implement Internet gateways to control BLE devices on a Wi-Fi network. Understand BLE security mechanisms with a special focus on Bluetooth pairing, bonding, and key exchange to cover encryption, privacy, and user data integrity. Implement Bluetooth Mesh using CSRMESH Technology. In Detail Bluetooth Low Energy (BLE) is a Wireless Personal Area network technology aimed at novel applications for smart devices. High-tech BLE profiles and services are being increasingly used by application developers and hardware enthusiasts to allow devices to interact with the surrounding world. This book will focus on a technical introduction to BLE and how it is reshaping small-distance communication. We will start with IoT, where many technologies such as BLE, Zigbee, and IEEE 802.15.4 Mesh will be introduced. The book will present BLE from an engineering perspective, from which the protocol stack, architecture, and layers are discussed. You will learn to implement customized projects for Peripheral/Central communication, BLE Beacons, indoor navigation using triangulation, and the Internet gateway for Bluetooth Low Energy Personal Network, all using various code samples and APIs on Android, iOS, and the Web. Finally, the book will conclude with a glimpse into future technologies destined to be prominent in years to come. Style and approach The book is a practical tutorial that will help you understand the background and technicalities of BLE and offers a friendly environment to build and create robust BLE projects. This hands-on approach will give you a clear vision of Bluetooth Low Energy and how it can be used in IoT.

Bluetooth Low Energy (BLE) is an exciting new technology that was introduced in 2010. It targets applications in the Internet of Things (IoT) space. With the recent release of Bluetooth 5 in late 2016 and Bluetooth mesh in mid-2017 (which builds on top of BLE), Bluetooth is now more capable than ever of becoming the standard wireless protocol used in many IoT applications including: smart homes, smart cities, medical devices, wearables, and sensor connectivity. Learning a new technology is always challenging and usually comes with a learning curve. Some technologies are easier to learn than others. Unfortunately, Bluetooth Low Energy (BLE) can be one of those hard ones. The lack of good resources including blogs, tutorials, and up-to-date books that help a beginner to learn BLE, makes the task even more difficult. That is, in fact, the primary goal of this book: to provide you with a complete understanding of the basics and core concepts of BLE that you can learn in a single weekend. Here's a tiny list of the benefits this book will help you achieve: Understand what Bluetooth Low Energy is and how it compares to Bluetooth Classic. Become better informed about the use cases where BLE makes the most sense. Learn all about Bluetooth 5 and the new features it brought us. Understand how two BLE devices discover and connect with each other. Understand how BLE devices exchange and transfer data between each other. Fully grasp concepts such as Peripherals, Centrals, Advertising, Connections, GATT, GAP, and many others. Learn about the newly released Bluetooth mesh standard. What readers are saying "I bought your BLE book and I love it. I am an iOS developer and your material helped me understand some of the finer points of BLE" -Alex Carrizo, Senior iOS Developer, iOS SME at Mobile Apps Company Topics include: The basics of Bluetooth Low Energy & Bluetooth 5.0. The difference between BLE and Bluetooth Classic (the one used for streaming audio and connecting headsets). The benefits and limitations of using BLE and which use cases make the most sense for BLE. The difference between a BLE Central and a BLE Peripheral. All about GATT (Generic Attribute Profile) and GAP (Generic Access Profile). How Bluetooth 5 achieves double the speed, four times the range, and eight times the advertising capacity.- How BLE devices advertise and discover each other. How two BLE devices connect to each other. How BLE devices exchange and transfer data between each other. Profiles, Services, and Characteristics. How secure BLE is, and how BLE devices secure the communication channel between them. The different connection and advertising parameters and what each of them means. An introduction to Bluetooth mesh. About the Author Mohammad Afaneh has been an embedded engineer for over 10 years. Since 2014, he has focused solely on learning and developing Bluetooth Low Energy applications. He even spent days and weeks reading through the 2,800+ page Bluetooth specification document looking for answers to questions he couldn't find answers to in other books and resources. He shares everything he knows about development for BLE technology at his website [www.novelbits.io](http://www.novelbits.io), and via training classes around the world. Extend the range of your Arduino skills, incorporate the new developments in both hardware and software, and understand how the electronic applications function in everyday life. This project-based book extends the Arduino Uno starter kits and increases knowledge of microcontrollers in electronic applications. Learn how to build complex Arduino projects, break them down into smaller ones, and then enhance them, thereby broadening your understanding of each topic. You'll use the Arduino Uno in a range of applications such as a blinking LED, route mapping with a mobile GPS system, and uploading information to the internet. You'll also apply the Arduino Uno to sensors, collecting and displaying information, Bluetooth and wireless communications, digital image captures, route tracking with GPS, controlling motors, color and sound, building robots, and internet access. With Arduino Applied, prior knowledge of electronics is not required, as each topic is described and illustrated with examples using the Arduino Uno. What You'll Learn Set up the Arduino Uno and its programming environment Understand the application of electronics in every day systems Build projects with a microcontroller and readily available electronic components Who This Book Is For Readers with an Arduino starter-kit and little-to-no programming experience and those interested in "how electronic appliances work." This document provides info. to organizations on the security capabilities of Bluetooth and provide recommendations to organizations employing Bluetooth technologies on securing them effectively. It discusses Bluetooth technologies and security capabilities in technical detail. This document assumes that the readers have at least some operating system, wireless networking, and security knowledge. Because of the constantly changing nature of the wireless security industry and the threats and vulnerabilities to the technologies, readers are strongly encouraged to take advantage of other resources (including those listed in this document) for more current and detailed information. Illustrations. Learn to build amazing robotic projects using the powerful BeagleBone Black. About This Book Push your creativity to

the limit through complex, diverse, and fascinating projects Develop applications with the BeagleBone Black and open source Linux software Sharpen your expertise in making sophisticated electronic devices Who This Book Is For This Learning Path is aimed at hobbyists who want to do creative projects that make their life easier and also push the boundaries of what can be done with the BeagleBone Black. This Learning Path's projects are for the aspiring maker, casual programmer, and budding engineer or tinkerer. You'll need some programming knowledge, and experience of working with mechanical systems to get the complete experience from this Learning Path. What You Will Learn Set up and run the BeagleBone Black for the first time Get to know the basics of microcomputing and Linux using the command line and easy kernel mods Develop a simple web interface with a LAMP platform Prepare complex web interfaces in JavaScript and get to know how to stream video data from a webcam Find out how to use a GPS to determine where your sailboat is, and then get the bearing and distance to a new waypoint Use a wind sensor to sail your boat effectively both with and against the wind Build an underwater ROV to explore the underwater world See how to build an autonomous Quadcopter In Detail BeagleBone is a microboard PC that runs Linux. It can connect to the Internet and run OSes such as Android and Ubuntu. You can transform this tiny device into a brain for an embedded application or an endless variety of electronic inventions and prototypes. This Learning Path starts off by teaching you how to program the BeagleBone. You will create introductory projects to get yourselves acquainted with all the nitty gritty. Then we'll focus on a series of projects that are aimed at hobbyists like you and encompass the areas of home automation and robotics. With each project, we'll teach you how to connect several sensors and an actuator to the BeagleBone Black. We'll also create robots for land, sea, and water. Yes, really! The books used in this Learning Path are: BeagleBone Black Cookbook BeagleBone Home Automation Blueprints Mastering BeagleBone Robotics Style and approach This practical guide transforms complex and confusing pieces of technology to become accessible with easy- to-succeed instructions. Through clear, concise examples, you will quickly get to grips with the core concepts needed to develop home automation applications with the BeagleBone Black.

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.

Make: BluetoothBluetooth LE Projects with Arduino, Raspberry Pi, and SmartphonesMaker Media, Inc.

Making Things Smart teaches the fundamentals of the powerful ARM microcontroller by walking beginners and experienced users alike through easily assembled projects comprised of inexpensive, hardware-store parts. Current ARM programming books take a bland, textbook approach focused on complex, beginner-unfriendly languages like C or ARM Assembler. Making Things Smart uses Espruino (JavaScript for Hardware), flattening the learning curve.

Implement Arduino-based designs in your project, and build, debug, and extend it using a solid engineering approach. This second edition is expanded to provide a better understanding of the engineering process and what it means to be an end-to-end developer. You'll start out by reviewing basic engineering procedures, from the fundamental requirements and preliminary design to prototyping and testing. You'll then apply those principles to single devices like LCDs, potentiometers and GPS modules, and move on to the integration of several modules into a larger project, a sub-autonomous robot. This robot will include devices such as GPS, Bluetooth, an OLED screen, an accelerometer, humidity and temp sensor, motor drivers, and ultrasonic sensor. This version goes on to cover how to create 3D models with Fusion360, make your own PCBs using Eagle, and use and maintain a 3D printer. Each and every chapter exemplifies this process and demonstrates how you can profit from the implementation of solid engineering principles—regardless of whether you just play in your basement or you want to publicize and sell your devices. With Practical Arduino Engineering you'll be able to review and improve this process, and even extend its scope. What You'll Learn ? Set up the Arduino software landscape and project for testing ? Review the process of hardware engineering as applicable to Arduino projects ? Create 3D models for 3D printing using Fusion360 in a robot chassis project ? Make PCBs using Eagle and incorporate it into a sensor station shield project ? Use and maintain a 3D printer with your own project ? Create Arduino shields in Eagle ? Debug Arduino projects of varying complexities via LabVIEW ? Use a special Arduino board for Bluetooth to control domestic and mobile Arduino projects Who This Book Is For Primarily aimed at intermediate engineers or engineering students. However, this book is also great for beginners and any maker who wants to expand their abilities in a single book.

This open access book constitutes the refereed proceedings of the 18th International Conference on String Processing and Information Retrieval, ICOST 2020, held in Hammamet, Tunisia, in June 2020.\* The 17 full papers and 23 short papers presented in this volume were carefully reviewed and selected from 49 submissions. They cover topics such as: IoT and AI solutions for e-health; biomedical and health informatics; behavior and activity monitoring; behavior and activity monitoring; and wellbeing technology. \*This conference was held virtually due to the COVID-19 pandemic.

Mastering Arduino is a practical, no-nonsense guide that will teach you the electronics and programming skills that you need to create advanced Arduino projects. Key Features Covers enough electronics and code for users at any level Includes complete circuit diagrams for all projects Final robot project combines knowledge from all the chapters Book Description Mastering Arduino is an all-in-one guide to getting the most out of your Arduino. This practical, no-nonsense guide teaches you all of the electronics and programming skills that you need to create advanced Arduino projects. This book is packed full of real-world projects for you to practice on, bringing all of the knowledge in the book together and giving you the skills to build your own robot from the examples in this book. The final two chapters discuss wireless technologies and how they can be used in your projects. The book begins with the basics of electronics, making sure that you understand components, circuits, and prototyping before moving on. It then performs the same function for code, getting you into the Arduino IDE and showing you how to connect the Arduino to a computer and run simple projects on your Arduino. Once the basics are out of the way, the next 10 chapters of the book focus on small projects centered around particular components, such as LCD displays, stepper motors, or voice synthesizers. Each of these chapters will get you familiar with the technology involved, how to build with it, how to program it, and how it can

be used in your own projects. What you will learn Explains the basics of electronics and circuits along with the Arduino IDE and basic C operations Use sensors to build a mini weather station Control LEDs using code Power a robot arm using stepper motors Remotely control your Arduino using RF, Bluetooth LE, and Bluetooth Classic Make a sound tone generator with buttons Who this book is for Mastering Arduino is for anybody who wants to experiment with an Arduino board and build simple projects. No prior knowledge is required, as the fundamentals of electronics and coding are covered in this book as well as advance projects.

Program the Internet of Things with Swift and iOS is a detailed tutorial that will teach you how to build apps using Apple's native APIs for the Internet of Things, including the Apple Watch, HomeKit, and Apple Pay. This is the second book by Ahmed Bakir (author of Beginning iOS Media App Development) and his team at devAtelier LLC, who have been involved in developing over 20 mobile projects. Written like a code review, this book presents a detailed "how" and "why" for each topic, explaining Apple-specific design patterns as they come up and pulling lessons from other popular apps. To help you getting up and running quickly, each chapter is framed within a working project, allowing you to use the sample code directly in your apps. The Internet of Things is not limited to Apple devices alone, so this book also explains how to interface with popular third-party hardware devices, such as the Fitbit and Raspberry Pi, and generic interfaces, like Restful API's and HTTPS. The Internet of Things is waiting — be a part of it!

This eBook provides comprehensive information on wireless technologies Bluetooth and Wifi. The book details the use cases for the above mentioned technologies, provides detailed descriptions on their technology architectures and protocol stacks and rounds up with a comparative analysis with other competing wireless technologies. The book is a good read for someone just getting to know these wireless technologies as it starts from the ground up and covers a lot of base to give you a very good perspective in the shortest amount of time. A field manual on contextualizing cyber threats, vulnerabilities, and risks to connected cars through penetration testing and risk assessment Hacking Connected Cars deconstructs the tactics, techniques, and procedures (TTPs) used to hack into connected cars and autonomous vehicles to help you identify and mitigate vulnerabilities affecting cyber-physical vehicles. Written by a veteran of risk management and penetration testing of IoT devices and connected cars, this book provides a detailed account of how to perform penetration testing, threat modeling, and risk assessments of telematics control units and infotainment systems. This book demonstrates how vulnerabilities in wireless networking, Bluetooth, and GSM can be exploited to affect confidentiality, integrity, and availability of connected cars. Passenger vehicles have experienced a massive increase in connectivity over the past five years, and the trend will only continue to grow with the expansion of The Internet of Things and increasing consumer demand for always-on connectivity. Manufacturers and OEMs need the ability to push updates without requiring service visits, but this leaves the vehicle's systems open to attack. This book examines the issues in depth, providing cutting-edge preventative tactics that security practitioners, researchers, and vendors can use to keep connected cars safe without sacrificing connectivity. Perform penetration testing of infotainment systems and telematics control units through a step-by-step methodical guide Analyze risk levels surrounding vulnerabilities and threats that impact confidentiality, integrity, and availability Conduct penetration testing using the same tactics, techniques, and procedures used by hackers From relatively small features such as automatic parallel parking, to completely autonomous self-driving cars—all connected systems are vulnerable to attack. As connectivity becomes a way of life, the need for security expertise for in-vehicle systems is becoming increasingly urgent. Hacking Connected Cars provides practical, comprehensive guidance for keeping these vehicles secure.

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

How important is Bluetooth Low Energy LE to the user organizations mission? Will team members regularly document their Bluetooth Low Energy LE work? Is Bluetooth Low Energy LE dependent on the successful delivery of a current project? How can you measure Bluetooth Low Energy LE in a systematic way? Are we making progress? and are we making progress as Bluetooth Low Energy LE leaders? Defining, designing, creating, and implementing a process to solve a challenge or meet an objective is the most valuable role... In EVERY group, company, organization and department. Unless you are talking a one-time, single-use project, there should be a process. Whether that process is managed and implemented by humans, AI, or a combination of the two, it needs to be designed by someone with a complex enough perspective to ask the right questions. Someone capable of asking the right questions and step back and say, 'What are we really trying to accomplish here? And is there a different way to look at it?' This Self-Assessment empowers people to do just that - whether their title is entrepreneur, manager, consultant, (Vice-)President, CxO etc... - they are the people who rule the future. They are the person who asks the right questions to make Bluetooth Low Energy LE investments work better. This Bluetooth Low Energy LE All-Inclusive Self-Assessment enables You to be that person. All the tools you need to an in-depth Bluetooth Low Energy LE Self-Assessment. Featuring 702 new and updated case-based questions, organized into seven core areas of process design, this Self-Assessment will help you identify areas in which Bluetooth Low Energy LE improvements can be made. In using the questions you will be better able to: - diagnose Bluetooth Low Energy LE projects, initiatives, organizations, businesses and processes using accepted diagnostic standards and practices - implement evidence-based best practice strategies aligned with overall goals - integrate recent advances in Bluetooth Low Energy LE and process design strategies into practice according to best practice guidelines Using a Self-Assessment tool known as the Bluetooth Low Energy LE Scorecard, you will develop a clear picture of which Bluetooth Low Energy LE areas need attention. Your purchase includes access details to the Bluetooth Low Energy LE self-assessment dashboard download which gives you your dynamically prioritized projects-ready tool and shows your organization exactly what to do next. You will receive the following contents with New and Updated specific criteria: - The latest quick edition of the book in PDF - The latest complete edition of the book in PDF, which criteria correspond to the criteria in... - The Self-Assessment Excel Dashboard, and... - Example pre-filled Self-Assessment Excel Dashboard to get familiar with results generation ...plus an extra, special, resource that helps you with project managing. INCLUDES LIFETIME SELF ASSESSMENT UPDATES Every self assessment comes with Lifetime Updates and Lifetime Free Updated Books. Lifetime Updates is an industry-first feature which allows you to receive verified self assessment updates, ensuring you always have the most accurate information at your fingertips.

Learn how to build apps using Apple's native APIs for the Internet of Things, including the Apple Watch, HomeKit, and Apple Pay. You'll also see how to interface with popular third-party hardware such as the Raspberry Pi, Arduino, and the FitBit family of devices. Program the Internet of Things with Swift and iOS is an update to the previous version and includes all new Swift 4 code. This book is a detailed tutorial that provides a detailed "how" and "why" for each topic, explaining Apple-specific design patterns as they come up and pulling lessons from other popular apps. To help you getting up and running quickly, each chapter is framed within a working project, allowing you to use the sample code directly in your apps. The Internet of Things is not limited to Apple devices alone, so this book also explains how to interface with popular third-party hardware devices, such as the Fitbit and Raspberry Pi, and generic interfaces, like Restful API's and HTTPS. You'll

also review new API's like Face ID and new design considerations, and look more closely at SSL and how to make IoT connected apps more resistant to hackers. The coverage of Apple Watch has been expanded as well. The Internet of Things is waiting — be a part of it! What You'll Learn Use Apple's native IoT Frameworks, such as HealthKit, HomeKit, and FaceID Interact with popular third-party hardware, such as the Raspberry Pi, Arduino, and FitBit Work with real projects to develop skills based in experience Make a smarter IoT with SiriKit and CoreML Who This Book Is For The primary audience for this book are readers who have a grasp of the basics of iOS development and are looking to improve their Internet of Things-specific skills. Intermediate to Advanced level. The secondary audience would be business decision makers (managers, business analysts, executives) who are looking to gain a rough understanding of what is involved in Internet of Things development for iOS.

Arduino 101 houses an Intel Curie module which offers a better performance at a lower power footprint. The module has two 32-bit MCUs - an x86 Intel Quark processor and an ARC EM4 processor along with 384kB flash memory and 80kB SRAM. These onboard MCUs combine a variety of new technologies including wireless communication via Bluetooth Low Energy, 6 axis motion sensor with an accelerometer, and a gyroscope. With this book, you will: Explore neural net pattern matching Have the Arduino learn gesture recognition Perfect for students, teachers, and hobbyists who need just enough information to get started with the Arduino 101.

Do we all define Bluetooth Low Energy (LE) in the same way? How can we improve Bluetooth Low Energy (LE)? Is there a critical path to deliver Bluetooth Low Energy (LE) results? Does Bluetooth Low Energy (LE) systematically track and analyze outcomes for accountability and quality improvement? What are the short and long-term Bluetooth Low Energy (LE) goals? This premium Bluetooth Low Energy (LE) self-assessment will make you the accepted Bluetooth Low Energy (LE) domain standout by revealing just what you need to know to be fluent and ready for any Bluetooth Low Energy (LE) challenge. How do I reduce the effort in the Bluetooth Low Energy (LE) work to be done to get problems solved? How can I ensure that plans of action include every Bluetooth Low Energy (LE) task and that every Bluetooth Low Energy (LE) outcome is in place? How will I save time investigating strategic and tactical options and ensuring Bluetooth Low Energy (LE) costs are low? How can I deliver tailored Bluetooth Low Energy (LE) advice instantly with structured going-forward plans? There's no better guide through these mind-expanding questions than acclaimed best-selling author Gerard Blokdyk. Blokdyk ensures all Bluetooth Low Energy (LE) essentials are covered, from every angle: the Bluetooth Low Energy (LE) self-assessment shows succinctly and clearly that what needs to be clarified to organize the required activities and processes so that Bluetooth Low Energy (LE) outcomes are achieved. Contains extensive criteria grounded in past and current successful projects and activities by experienced Bluetooth Low Energy (LE) practitioners. Their mastery, combined with the easy elegance of the self-assessment, provides its superior value to you in knowing how to ensure the outcome of any efforts in Bluetooth Low Energy (LE) are maximized with professional results. Your purchase includes access details to the Bluetooth Low Energy (LE) self-assessment dashboard download which gives you your dynamically prioritized projects-ready tool and shows you exactly what to do next. Your exclusive instant access details can be found in your book. You will receive the following contents with New and Updated specific criteria: - The latest quick edition of the book in PDF - The latest complete edition of the book in PDF, which criteria correspond to the criteria in... - The Self-Assessment Excel Dashboard, and... - Example pre-filled Self-Assessment Excel Dashboard to get familiar with results generation ...plus an extra, special, resource that helps you with project managing. **INCLUDES LIFETIME SELF ASSESSMENT UPDATES** Every self assessment comes with Lifetime Updates and Lifetime Free Updated Books. Lifetime Updates is an industry-first feature which allows you to receive verified self assessment updates, ensuring you always have the most accurate information at your fingertips.

El curso de Tecnología de Redes Inalámbricas presenta al estudiante las diferentes técnicas y estándares actualmente utilizados para la transmisión de datos a través del aire usando estándares como 802.11, Bluetooth, Zigbee, Infrarrojo, etc. Frente a tal variedad de posibilidades para la organización de las prácticas de la asignatura, hemos considerado el uso de un sistema de Desarrollo Abierto que sea lo suficientemente versátil como para adaptar módulos que permitan la prueba de las diferentes tecnologías de redes inalámbricas existentes, por esta razón ha sido elegido la plataforma Arduino, lo que nos permitirá agregar módulos adicionales (Shield) con suficiente adaptación al tiempo de práctica. Arduino es una familia de microcontroladores y un entorno de creación de software que facilita la creación de programas (llamados bocetos) que pueden interactuar con el mundo físico. En el caso de este libro, la idea es usar Arduino con diferentes versiones del estándar Bluetooth. El libro está dividido en diez proyectos y, al final del libro, en el Anexo I, aparece el código fuente de la mayoría de estos proyectos.

With Bluetooth Low Energy (BLE), smart devices are about to become even smarter. This practical guide demonstrates how this exciting wireless technology helps developers build mobile apps that share data with external hardware, and how hardware engineers can gain easy and reliable access to mobile operating systems. This book provides a solid, high-level overview of how devices use BLE to communicate with each other. You'll learn useful low-cost tools for developing and testing BLE-enabled mobile apps and embedded firmware and get examples using various development platforms—including iOS and Android for app developers and embedded platforms for product designers and hardware engineers. Understand how data is organized and transferred by BLE devices Explore BLE's concepts, key limitations, and network topology Dig into the protocol stack to grasp how and why BLE operates Learn how BLE devices discover each other and establish secure connections Set up the tools and infrastructure for BLE application development Get examples for connecting BLE to iPhones, iPads, Android devices, and sensors Develop code for a simple device that transmits heart rate data to a mobile device

This book provides an introduction to Bluetooth programming, with a specific focus on developing real code. The authors discuss the major concepts and techniques involved in Bluetooth programming, with special emphasis on how they relate to other networking technologies. They provide specific descriptions and examples for creating applications in a number of programming languages and environments including Python, C, Java, GNU/Linux, Windows XP, Symbian Series 60,

and Mac OS X. No previous experience with Bluetooth is assumed, and the material is suitable for anyone with some programming background. The authors place special emphasis on the essential concepts and techniques of Bluetooth programming, starting simply and allowing the reader to quickly master the basic concepts before addressing advanced features.

**The First Complete Guide to Bluetooth Low Energy: How It Works, What It Can Do, and How to Apply It** A radical departure from conventional Bluetooth technology, Bluetooth low energy (BLE) enables breakthrough wireless applications in industries ranging from healthcare to transportation. Running on a coin-sized battery, BLE can operate reliably for years, connecting and extending everything from personal area network devices to next-generation sensors. Now, one of the standard's leading developers has written the first comprehensive, accessible introduction to BLE for every system developer, designer, and engineer. Robin Heydon, a member of the Bluetooth SIG Hall of Fame, has brought together essential information previously scattered through multiple standards documents, sharing the context and expert insights needed to implement high-performance working systems. He first reviews BLE's design goals, explaining how they drove key architectural decisions, and introduces BLE's innovative usage models. Next, he thoroughly covers how the two main parts of BLE, the controller and host, work together, and then addresses key issues from security and profiles through testing and qualification. This knowledge has enabled the creation of Bluetooth Smart and Bluetooth Smart Ready devices. This guide is an indispensable companion to the official BLE standards documents and is for every technical professional and decision-maker considering BLE, planning BLE products, or transforming plans into working systems. Topics Include BLE device types, design goals, terminology, and core concepts Architecture: controller, host, applications, and stack splits Usage models: presence detection, data broadcasting, connectionless models, and gateways Physical Layer: modulation, frequency band, radio channels, power, tolerance, and range Direct Test Mode: transceiver testing, hardware interfaces, and HCI Link Layer: state machine, packets, channels, broadcasting, encryption, and optimization HCI: physical/logical interfaces, controller setup, and connection management L2CAP: channels and packet structure, and LE signaling channels Attributes: grouping, services, characteristics, and protocols Security: pairing, bonding, and data signing Generic Access Profiles: roles, modes, procedures, security modes, data advertising, and services Applications, devices, services, profiles, and peripherals Testing/qualification: starting projects, selecting features, planning, testing, compliance, and more

This book is a practical guide to programming Bluetooth Low Energy in iPhones and iPads. In this book, you will learn the basics of how to program an iOS device to communicate with any Central or Peripheral device over Bluetooth Low Energy. Each chapter of the book builds on the previous one, culminating in three projects: - A Beacon and Scanner - A Echo Server and Client - A Remote Controlled Device Through the course of the book you will learn important concepts that relate to: - How Bluetooth Low Energy works - How data is sent and received - Common paradigms for handling data This book is excellent for anyone who has basic or advanced knowledge of iOS programming in SWIFT.

Discover all the amazing things you can do with Arduino Arduino is a programmable circuit board that is being used by everyone from scientists, programmers, and hardware hackers to artists, designers, hobbyists, and engineers in order to add interactivity to objects and projects and experiment with programming and electronics. This easy-to-understand book is an ideal place to start if you are interested in learning more about Arduino's vast capabilities. Featuring an array of cool projects, this Arduino beginner guide walks you through every step of each of the featured projects so that you can acquire a clear understanding of the different aspects of the Arduino board. Introduces Arduino basics to provide you with a solid foundation of understanding before you tackle your first project Features a variety of fun projects that show you how to do everything from automating your garden's watering system to constructing a keypad entry system, installing a tweeting cat flap, building a robot car, and much more Provides an easy, hands-on approach to learning more about electronics, programming, and interaction design for Makers of all ages Arduino Projects For Dummies is your guide to turning everyday electronics and plain old projects into incredible innovations. Get Connected! To find out more about Brock Craft and his recent Arduino creations, visit [www.facebook.com/ArduinoProjectsForDummies](http://www.facebook.com/ArduinoProjectsForDummies)

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