Getting Started With Bluetooth Low Energy Tools And Techniques For Low Power Networking Carles Cufi

This book addresses a wide range of topics in areas of intelligent systems and artificial intelligence and their real-world applications. The 22 chapters have been selected from the 168 papers published in the proceedings of the SAI Intelligent Systems Conference 2016 (IntelliSys 2016), which received highly positive feedback in peer reviews. The IntelliSys 2016 conference was held in London on 21–22 September 2016. This fascinating book offers readers state-of-the-art intelligent methods and techniques for solving real-world problems along with a vision of future research.

This book constitutes the refereed post-conference proceedings of the First EAI International Conference on Sustainable Energy for Smart Cities, SESC 2029, held as part of the Smart City 360° Summit event in Braga, Portugal, in December 2019. The 23 revised full papers were carefully reviewed and selected from 38 submissions. They contribute to answer complex societal, technological, and economic problems of emergent smart cities. The papers are organized thematically in tracks, starting with mobile systems, cloud resource management and scheduling, machine learning, telecommunication systems, and network management. The papers are grouped in topical sections on electric mobility; power electronics; intelligent, transportation systems; demand response; energy; smart homes; Internet of Things; monitoring; network communications; power quality; power electronics.

This book represents the work of a team of theorists and practitioners from various Central and Eastern European countries who offer a multidisciplinary approach to security and safety issues which companies in international and domestic trade, as well as consumers, are facing nowadays. Contributions range from the topics of terrorism and piracy, various aspects of theft and theft prevention, to the challenges of security and privacy in electronic and mobile commerce. Therefore, the book is a powerful resource in solving problems because it not only considers security, privacy, and ethical issues, among others, but also discusses how to prevent them before they occur.

This novel textbook introduces Enterprise Internet of Things from technology, management and business perspectives, carefully examining enterprise environments through the lens of modernization with the Internet of Things (IoT). It also includes detailed case studies to offer meaningful insights for readers from various disciplines and areas. The book analyzes the ways in which the technology could contribute to the enterprise world in terms of revenue and new business models, and addresses the strategies and principles involved in developing IoT solutions with software engineering practices such as DevOps and Micro services architecture principles. By doing so, it offers readers a clear overview of the power of Internet of Things in building next generation enterprise use cases. The book enables readers to understand

the latest opportunities to create new business models in enterprises using the unprecedented level of device connectivity, and the wealth of data generated and information exchange among these devices. As such, it appeals to various user groups, such as engineers trying to solve problems in their own domains using Enterprise IoT, academics interested in gaining a better understanding of applications of IoT in large-scale enterprises, and researchers wanting to contribute to the ever-growing and complex area of IoT.

App Development Recipes for iOS and watchOS explores the technical side of app development with tips and tricks to avoid those little things that become big frustrations, outside of the realm of development, causing many people to throw up their hands and say "It's just not worth the hassle!" The experiential nature of this work sets it apart from other iOS and watchOS books. Even if you are a developer who is completely new to Swift, iOS or watchOS, you'll find the right experienced-based answers to important questions like "Why do I need version control?", "Why is testing so important?" and more specific problems directly related to iOS and watchOS development with Swift. We discover and summarize the most common problems and derive the solutions; not just a short answer and screenshot, but a systematic, logical derivation, that is, how we got to the solution. /div After the introductory basics, each chapter delivers a problem statement and a solution. The experienced developer may, without losing anything, skip to whatever problem with which they are currently dealing. At the same time, we guide the less experienced developer through the process with focus on solving problems along the way. What you will learn: iOS career options for the new developer Working with Source Code and Version Control How to work with iOS accessory devices Understanding development methodologies such as Agile/Scrum User Experience Development and UI Tools Unit, UI, and Beta Testing Publishing your work Who this book is for:/divDevelopers who need to find specific solutions to common problems in developing apps for iOS and watchOS. Raspberry Pi 3 model B is a new Raspberry Pi board which included WiFi and Bluetooth modules. This book helps you to get started with Raspberry Pi 3. The following is highlight topics in this book: * Introduction to Raspberry Pi 3 * Operating System * Powering Up and Running * Connecting to a Network : Wired and WiFi * Raspberry Pi Programming * Working with Bluetooth and iBeacon * Deploying LAMP Stack * Accessing GPIO * Raspberry Pi 3 Serial Debugging 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.

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.

This book constitutes the proceedings of the 14th IFIP WG 11.12 International Symposium on Human Aspects of Information Security and Assurance, HAISA 2020, held in Mytilene, Lesbos, Greece, in July 2020.* The 27 full papers presented in this volume were carefully reviewed and selected from 43 submissions. They are organized in the following topical sections: privacy and COVID-19; awareness and training; social engineering; security behavior; education; end-user security; usable security; security policy; and attitudes and perceptions. *The symposium was held virtually due to the COVID-19 pandemic.

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 book helps you to get started with Windows 10 IoT Core for Raspberry Pi 3 board. The following is highlight topic of this book: * Introduction to Raspberry Pi 3 and Windows 10 * Deploying Windows IoT Core on Raspberry Pi 3 * Running and Configuring Windows 10 IoT Core * Hello World - LED Blinking * Raspberry Pi GPIO Programming * Working with I2C/TWI Protocol * Working with SPI Protocol * Working with UART

Build clever, collaborative, and powerful automation systems with the Raspberry Pi and Python. Key Features Create your own Pi-Rover or Pi-Hexipod robots Develop practical applications in Python using Raspberry Pi Build your own Jarvis, a highly advanced computerized AI Book Description This Learning Path takes you on a journey in the world of robotics and teaches you all that you can achieve with Raspberry Pi and Python. It teaches you to harness the power of Python with the Raspberry Pi 3 and the

Raspberry Pi zero to build superlative automation systems that can transform your business. You will learn to create text classifiers, predict sentiment in words, and develop applications with the Tkinter library. Things will get more interesting when you build a human face detection and recognition system and a home automation system in Python, where different appliances are controlled using the Raspberry Pi. With such diverse robotics projects, you'll grasp the basics of robotics and its functions, and understand the integration of robotics with the IoT environment. By the end of this Learning Path, you will have covered everything from configuring a robotic controller, to creating a self-driven robotic vehicle using Python. Raspberry Pi 3 Cookbook for Python Programmers - Third Edition by Tim Cox, Dr. Steven Lawrence Fernandes Python Programming with Raspberry Pi by Sai Yamanoor, Srihari Yamanoor Python Robotics Projects by Prof. Diwakar Vaish What you will learn Build text classifiers and predict sentiment in words with the Tkinter library Develop human face detection and recognition systems Create a neural network module for optical character recognition Build a mobile robot using the Raspberry Pi as a controller Understand how to interface sensors, actuators, and LED displays work Apply machine learning techniques to your models Interface your robots with Bluetooth Who this book is for This Learning Path is specially designed for Python developers who want to take their skills to the next level by creating robots that can enhance people's lives. Familiarity with Python and electronics will aid understanding the concepts in this Learning Path.

This book is a timely document of state-of-the-art techniques in the domain of contact tracing applications. Well known in the field of medical science, this topic has recently received attention from governments, industries and academic communities due to the COVID-19 pandemic. This book provides a link between new proposals related to contact tracing applications and a contextual literature review primarily from the cryptologic viewpoint. As these applications are related to security and privacy of individuals, analyzing them from cryptologic viewpoint is of utmost importance. Therefore, present developments from cryptologic aspects of most proposals around the world, including Singapore, Europe, USA, Australia and India, have been discussed. Providing an in-depth study on the design rationale of each protocol, this book is of value to researchers, students and professionals alike.

This book helps you to get started with ARM mbed development. Several codes samples are provided to illustrate how to work with ARM mbed boards using online mbed Compiler. The following is highlight topics in this book. * Setting Up Development Environment * mbed Digital I/O * ARM mbed UART * mbed Analog I/O * mbed I2C/TWI * mbed SPI * mbed and Bluetooth Low Energy (BLE) * Controlling Servo Motor

This book includes a selection of papers from the 2018 World Conference on Information Systems and Technologies (WorldCIST'18), held in Naples, Italy on March 27-29, 2018. WorldCIST is a global forum for researchers and practitioners to present and discuss recent results and innovations, current trends, professional experiences and the challenges of modern information systems and technologies research together with their technological development and applications. The main topics covered are: A) Information and Knowledge Management; B) Organizational Models and Information Systems; C) Software and Systems Modeling; D) Software Systems, Architectures, Applications and Tools; E) Multimedia Systems and Applications; F)

Computer Networks, Mobility and Pervasive Systems; G) Intelligent and Decision Support Systems; H) Big Data Analytics and Applications; I) Human–Computer Interaction; J) Ethics, Computers & Security; K) Health Informatics; L) Information Technologies in Education; M) Information Technologies in Radiocommunications; N) Technologies for Biomedical Applications.

The Internet of Things (IoT) has become a major influence on the development of new technologies and innovations. When utilized properly, these applications can enhance business functions and make them easier to perform. Protocols and Applications for the Industrial Internet of Things discusses and addresses the difficulties, challenges, and applications of IoT in industrial processes and production and work life. Featuring coverage on a broad range of topics such as industrial process control, machine learning, and data mining, this book is geared toward academicians, computer engineers, students, researchers, and professionals seeking current and relevant research on applications of the IoT.

Introduction to Data Science and Machine Learning has been created with the goal to provide beginners seeking to learn about data science, data enthusiasts, and experienced data professionals with a deep understanding of data science application development using open-source programming from start to finish. This book is divided into four sections: the first section contains an introduction to the book, the second covers the field of data science, software development, and open-source based embedded hardware; the third section covers algorithms that are the decision engines for data science applications; and the final section brings together the concepts shared in the first three sections and provides several examples of data science applications.

The information infrastructure - comprising computers, embedded devices, networks and software systems - is vital to operations in every sector: chemicals, commercial facilities, communications, critical manufacturing, dams, defense industrial base, emergency services, energy, financial services, food and agriculture, government facilities, healthcare and public health, information technology, nuclear reactors, materials and waste, transportation systems, and water and wastewater systems. Global business and industry, governments, indeed society itself, cannot function if major components of the critical information infrastructure are degraded, disabled or destroyed. Critical Infrastructure Protection XI describes original research results and innovative applications in the interdisciplinary field of critical infrastructure protection. Also, it highlights the importance of weaving science, technology and policy in crafting sophisticated, yet practical, solutions that will help secure information, computer and network assets in the various critical infrastructure sectors. Areas of coverage include: Infrastructure Protection, Infrastructure Modeling and Simulation, Industrial Control System Security, and Internet of Things Security. This book is the eleventh volume in the annual series produced by the International Federation for Information Processing (IFIP) Working Group 11.10 on Critical Infrastructure Protection, an international community of scientists, engineers, practitioners and policy makers dedicated to advancing research, development and implementation efforts focused on infrastructure protection. The book contains a selection of sixteen edited papers from the Eleventh Annual IFIP WG 11.10 International Conference on Critical Infrastructure Protection, held at SRI International, Arlington, Virginia, USA in the spring of 2017. Critical Infrastructure Protection XI is an important resource for researchers, faculty members and graduate students, as well as for policy makers, practitioners and other individuals with interests in homeland security.

As the world continues to become more mobile and business is conducted in the blink of an eye, a new system is taking communication one step further. Bluetooth technology unites computing with telecommunication. This innovative breakthrough eliminates the need for cables by using short-range radio links. Equipped with features such as robustness, low complexity, low power and low cost, this technology

incorporates any digital device, including PDAs and printers, into the Bluetooth system. Getting Started with Bluetooth teaches you concepts about Bluetooth specifications, devices, and architecture, giving you the knowledge to gain a competitive edge!

Getting Started for Internet of Things with Launch Pad and ESP8266 provides a platform to get started with the Ti launch pad and IoT modules for Internet of Things applications. The book provides the basic knowledge of Ti launch Pad and ESP8266 based customized modules with their interfacing, along with the programming. The book discusses the application of Internet of Things in different areas. Several examples for rapid prototyping are included, this to make the readers understand the concept of IoT. The book comprises of twenty-seven chapters, which are divided into four sections and which focus on the design of various independent prototypes. Section-A gives a brief introduction to Ti launch pad (MSP430) and Internet of Things platforms like GPRS, NodeMCU and NuttyFi (ESP8266 customized board), and it shows steps to program these boards. Examples on how to interface these boards with display units, analog sensors, digital sensors and actuators are also included, this to make reader comfortable with the platforms. Section-B discusses the communication modes to relay the data like serial out, PWM and I2C. Section-C explores the IoT data loggers and shows certain steps to design and interact with the servers. Section-D includes few IoT based case studies in various fields. This book is based on the practical experience of the authors while undergoing projects with students and partners from various industries.

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This book presents the latest, innovative research findings on P2P, Parallel, Grid, Cloud, and Internet Computing. It gathers the Proceedings of the 12th International Conference on P2P, Parallel, Grid, Cloud and Internet Computing, held on November 8–10, 2017 in Barcelona, Spain. These computing technologies have rapidly established themselves as breakthrough paradigms for solving complex problems by enabling the aggregation and sharing of an increasing variety of distributed computational resources at large scale. Grid Computing originated as a paradigm for high-performance computing, offering an alternative to expensive supercomputers through different forms of large-scale distributed computing, while P2P Computing emerged as a new paradigm after client-server and web-based computing and has shown to be useful in the development of social networking, B2B (Business to Business), B2C (Business to Consumer), B2G (Business to Government), B2E (Business to Employee), and so on. Cloud Computing has been defined as a "computing paradigm where the boundaries of computing are determined by economic rationale rather than technical limits". Cloud computing has quickly been adopted in a broad range of application domains and provides utility computing at large scale. Lastly, Internet Computing is the basis of any large-scale distributed computing paradigm; it has very rapidly developed into a flourishing field with an enormous impact on today's information societies, serving as a universal platform comprising a large variety of computing forms such as Grid, P2P, Cloud and Mobile computing. The aim of the book "Advances on P2P, Parallel, Grid, Cloud and Internet Computing" is to provide the latest findings, methods and development techniques from both theoretical and practical perspectives, and to reveal synergies between these large-scale computing paradigms.

This volume constitutes the refereed proceedings of the 8th International Conference on Multimedia Communications, Services and Security, MCSS 2015, held in Krakow, Poland, in November 2015. The 16 full papers included in the volume were selected from 39 submissions. The papers cover ongoing research activities in the following topics: multimedia services; intelligent monitoring; audio-visual systems; biometric applications; experiments and deployments.

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.

Raspberry Pi Zero W (Wireless) is the second generation of Raspberry Pi Zero with additional WiFi and Bluetooth capabilities. This book helps you to get started with Raspberry Pi Zero W. The following is highlight topics in this book: * Introduction to Raspberry Pi Zero W * Operating System * Powering Up and Running * Connecting to a Network * Deploying LAMP Stack * Raspberry Pi Programming * Accessing GPIO * Raspberry Pi Zero W Serial Debugging * Working with Bluetooth and iBeacon

Intel has released Intel Curie which deployed on Arduino and Genuino 101. This book helps you to get started with Arduino and Genuino 101 development using Sketch. The following is highlight topics: * Setting up Development Environment * Sketch Programming: Digital and Analog I/O * Working with SPI * Working with I2C * BLE Programming * Working with Accelerator and Gyroscope * Working with RTC * Accessing EEPROM * Working with Arduino Firmata * Arduino Networking

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

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 presents the proceedings of four conferences: The 16th International Conference on Frontiers in Education: Computer Science and Computer Engineering + STEM (FECS'20), The 16th International Conference on Foundations of Computer Science (FCS'20), The 18th International Conference on Software Engineering Research and Practice (SERP'20), and The 19th International Conference on e-Learning, e-Business, Enterprise Information Systems, & e-Government (EEE'20). The conferences took place in Las Vegas, NV, USA, July 27-30, 2020 as part of the larger 2020 World Congress in Computer Science, Computer Engineering, & Applied Computing (CSCE'20), which features 20 major tracks. Authors include academics, researchers, professionals, and students. This book contains an open access chapter entitled, "Advances in Software Engineering, Education, and e-Learning". Presents the proceedings of four conferences as part of the 2020 World Congress in Computer Science, Computer Engineering, & Applied Computing (CSCE'20); Includes the tracks Computer Engineering + STEM, Foundations of Computer Science, Software Engineering Research, and e-Learning, e-Business, Enterprise Information Systems, & e-Government; Features papers from FECS'20, FCS'20, SERP'20, EEE'20, including one open access chapter.

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{u2019}ll learn useful low-cost tools for developing and testing BLE-enabled mobile apps and embedded firmware and get examples using various development platforms{u2014}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{u2019}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.

These proceedings of the SAI Intelligent Systems Conference 2016 (IntelliSys 2016) offer a remarkable collection of chapters on a wide range of topics in intelligent systems, artificial intelligence and their applications to the real world. Authors hailing from 56 countries on 5 continents submitted 404 papers to the conference, attesting to the global importance of the conference's themes. After being reviewed, 222 papers were accepted for presentation, and 168 were ultimately selected for these proceedings. Each has been reviewed on the basis of its originality, novelty and rigorousness. The papers not only present state-of-the-art methods and valuable experience from researchers in the related research areas; they also outline the field's future development. Wireless communication is continuously evolving to improve and be a part of our daily communication. This leads to improved quality of services and applications supported by networking technologies. We are now able to use LTE, LTE-Advanced, and other emerging technologies due to the enormous efforts that are made to improve the quality of service in cellular networks. As the future of networking is uncertain, the use of deep learning and big data analytics is a point of focus as it can work in many capacities at a variety of levels for wireless communications. Implementing Data Analytics and Architectures for Next Generation Wireless Communications addresses the existing and emerging theoretical and practical challenges in the design, development, and implementation of big data algorithms, protocols, architectures, and applications for next generation wireless communications and their applications in smart cities. The chapters of this book bring together academics and industrial practitioners to exchange, discuss, and implement the latest innovations and applications of data analytics in advanced networks. Specific topics covered include key encryption techniques, smart home appliances, fog communication networks, and security in the internet of things. This book is valuable for technologists, data analysts, networking experts, practitioners, researchers, academicians, and students. High-precision location information is increasingly useful for mobile application developers, since it allows devices to interact with the world around them. This practical book shows you how to achieve arm's reach accuracy with iBeacons, simple transmitters that enable your applications to react to nearby surroundings and then deliver timely, relevant information—especially indoors, where GPS and cell service are inaccurate. Whether you're enabling a map, giving users directions, creating a game, recommending purchases, letting users check in, or creating an immersive experience, you'll learn how iBeacons provide precise location information, empowering your applications to engage and interact with users nearby. Get examples of several application types you can build with iBeacons Learn how iBeacons provide applications with proximity information Set up, activate, and test iBeacons on both specialized and general-purpose hardware Explore the APIs and tools you need to develop location-aware mobile applications Use built-in iOS features to interact with iBeacons, including Passbook Build networks to help shoppers, travelers, conference attendees, and others find what they're looking for

Your no-nonsense guide to Near Field Communication Are you a newcomer to Near Field Communication and baffled by the scant documentation and online support available for this powerful new technology? You've come to the right place! Written in a friendly and easily accessible manner, NFC For Dummies takes the intimidation out of working with the features of NFC-enabled devices

and tells you exactly what it is and what it does'and doesn't do. NFC is revolutionizing the way people interact on a daily basis. It enables big data and cloud-based computing through mobile devices and can be used by anyone with a smartphone or tablet every day! Soon to be as commonplace as using Wi-Fi or the camera on your smartphone, NFC is going to forever change the way we interact with people and the things around us. It simplifies the sending and receiving of information, makes monetary transactions simple and secure?Apple Pay already uses NFC'and is a low-cost product to manufacture and use. As more developers create apps with NFC, you're going to see it used regularly'everywhere from cash registers to your social media accounts to electronic identity systems. Don't get left behind; get up to speed on NFC today! Provides a plain-English overview of NFC Covers the history and technology behind NFC Helps you make sense of IoT and powered chips Explains proximity technologies and non-payment applications Whether you're a developer, investor, or a mobile phone user who is excited about the capabilities of this rapidly growing technology, NFC For Dummies is the reference you'll want to keep close at hand!

This updated and expanded second edition of the Artech House bestseller, Inside Bluetooth Low Energy, presents the recent developments within the Bluetooth Core Specifications 4.1 and 4.2. This new edition explores both Internet of Things (IoT) and Bluetooth Low Energy (LE) in one single flow and demonstrates how this technology is very well suited for IoT implementations. The book covers all the advances within the new specifications including Bluetooth LE enhanced power efficiency, faster connections, and enhanced privacy and security. Developed for ultra-low power devices, such as heart rate monitors, thermometers, and sensors, Bluetooth LE is one of the latest, most exciting enhancements to Bluetooth technology. This cutting-edge book presents an easy-to-understand, broad-based explanation of Bluetooth LE, its building blocks and how they all come together. Packed with examples and practical scenarios, the book helps readers rapidly gain a clear, solid understanding of Bluetooth LE in order to work more effectively with its specification. This book explores the architecture of the Bluetooth LE stack and functionality of its layers and includes a broad view of the technology, identifies the various building blocks, and explains how they come together. Readers will also find discussions on Bluetooth basics, providing the background information needed to master Bluetooth LE.

This book is a practical guide to programming Bluetooth Low Energy for Android phones and Tablets In this book, you will learn the basics of how to program an Android 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 - 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 Skill Level This book is excellent for anyone who has basic or advanced knowledge of Java programming on Android.

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