

# Bluetooth Low Energy The Developers Handbook

As opposed to back-end web development which deals with servers, front-end web development focuses on the end users' interactions with a website on a browser. A skillful front-end web developer knows more than just the basics of HTML, CSS and JavaScript. Going beyond the major web-based languages, this book represents an attempt to compile all the knowledge needed to become a professional front-end web developer. The reader will be introduced to more than 200 web extensions, frameworks, tools, and libraries, along with a complete illustration of all Web APIs known to the world today. Overview: Chapter 1: Development Environments Chapter 2: HTML 5.2 Chapter 3: Bootstrap 5 Chapter 4: CSS 3 Chapter 5: SEO Chapter 6: Cordova Chapter 7: SVG Chapter 8: ECMAScript 2020 / ES11 Chapter 9: HTML DOM Chapter 10: Advanced Web APIs Chapter 11: jQuery 3.5 Chapter 12: Extensions and Tools Chapter 13: Canvas Chapter 14: WebGL \*\* special note: this book partially overlaps with two books by the same author: 1) Web Coding Bible (18 Books in 1) 2) An Effective Guide to Modern JavaScript (ECMAScript 2017 / ES8)

This book explores the digital transformations of

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democracy and democratic societies. It examines the various challenges posed by these transformations in the context of political practice and to theoreticians of democracy and political communication. The authors present studies from different countries, related to various effects of digitalization processes. Topics covered include, but are not limited to: Innovation in civil society research, new forms of civic participation, new dimensions of democratization and local governance processes, political changes and public participation, civic and political activities, political campaigning or other phenomenon driven by the implementation of information and communications technology (ICT) into politics. Therefore, the book is a must-read for all scholars and researchers of political science, practitioners, and policy-makers, interested in a better understanding of digital politics, digitalization processes, and democracy in general.

Advanced Android™ Application Development, Fourth Edition, is the definitive guide to building robust, commercial-grade Android apps. Systematically revised and updated, this guide brings together powerful, advanced techniques for the entire app development cycle, including design, coding, testing, debugging, and distribution. With the addition of quizzes and exercises in every chapter, it is ideal for both professional and classroom use. An outstanding practical reference for the newest

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Android APIs, this guide provides in-depth explanations of code utilizing key API features and includes downloadable sample apps for nearly every chapter. Together, they provide a solid foundation for any modern app project. Throughout, the authors draw on decades of in-the-trenches experience as professional mobile developers to provide tips and best practices for highly efficient development. They show you how to break through traditional app boundaries with optional features, including the Android NDK, Google Analytics and Android Wear APIs, and Google Play Game Services. New coverage in this edition includes Integrating Google Cloud Messaging into your apps Utilizing the new Google location and Google Maps Android APIs Leveraging in-app billing from Google Play, as well as third-party providers Getting started with the Android Studio IDE Localizing language and using Google Play App Translation services Extending your app's reach with Lockscreen widgets and DayDreams Leveraging improvements to Notification, Web, SMS, and other APIs Annuzzi has released new source code samples for use with Android Studio. The code updates are posted to the associated blog site:

<http://advancedandroidbook.blogspot.com/> This title is an indispensable resource for intermediate- to advanced-level Java programmers who are now developing for Android, and for seasoned mobile

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developers who want to make the most of the new Android platform and hardware. This revamped, newly titled edition is a complete update of Android™ Wireless Application Development, Volume II: Advanced Topics, Third Edition.

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.

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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.

For engineers, product designers, and technical marketers who need to design a cost-effective, easy-to-use, short-range wireless product that works, this practical guide is a must-have. It explains and compares the major wireless standards - Bluetooth, Wi-Fi, 802.11abgn, ZigBee, and 802.15.4 - enabling you to choose the best standard for your product. Packed with practical insights based on the author's 10 years of design experience, and highlighting pitfalls and trade-offs in performance and cost, this book will ensure you get the most out of your chosen standard by teaching you how to tailor it for your specific implementation. With information on intellectual property rights and licensing, production test, and regulatory approvals, as well as analysis of the market for wireless products, this resource truly provides everything you need to design and

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implement a successful short-range wireless product.

This book introduces the subject of wearable computing and covers in the "Android Wear" platform and "Google FIT platform." The book starts with the history and background of Wearable Computing and the evolution of the nature of the Human Computer Interface and Interaction. Subsequent chapters cover the "Android Wear" and "Google FIT platforms", and examines setting up of the development environment for writing "Wearable" programs, and running them on wearable hardware devices.

This book constitutes the refereed proceedings of the 7th International Conference on E-Technologies, MCETECH 2017, held in Ottawa, ON, Canada, in May 2017. This year's conference drew special attention to the ever-increasing role of the Internet of Things (IoT); and the contributions span a variety of application domains such as e-Commerce, e-Health, e-Learning, and e-Justice, comprising research from models and architectures, methodology proposals, prototype implementations, and empirical validation of theoretical models. The 19 papers presented were carefully reviewed and selected from 48 submissions. They were organized in topical sections named: pervasive computing and smart applications; security, privacy and trust; process modeling and adaptation; data analytics and machine learning; and e-health and e-commerce.

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Combines in one volume the basics of evolving radio access technologies and their implementation in mobile phones Reviews the evolution of radio access technologies (RAT) used in mobile phones and then focuses on the technologies needed to implement the LTE (Long term evolution) capability Coverage includes the architectural aspects of the RF and digital baseband parts before dealing in more detail with some of the hardware implementation Unique coverage of design parameters and operation details for LTE-A phone transceiver Discusses design of multi-RAT Mobile with the consideration of cost and form factors Provides in one book a review of the evolution of radio access technologies and a good overview of LTE and its implementation in a handset Unveils the concepts and research updates of 5G technologies and the internal hardware and software of a 5G phone

In just 24 sessions of one hour or less, learn how to build powerful apps for the world's most popular mobile platform: Android 4.3. Using this book's straightforward, step-by-step approach, you'll build complete Android 4.3 apps from the ground up as you master the skills you need to design, develop, test, and publish powerful solutions. Extensively updated for Android's newest features and tools, every lesson builds on what you've already learned, giving you a rock-solid foundation for real-world success! Highlights of this new Third Edition include: Extensive new coverage: fragments, action bar, SQLite, content providers, Facebook

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SDK, and more Practical guidance on developing for multiple Android versions How to use open source projects to simplify Android development New topic-focused structure with at least one complete project in nearly every chapter Register your book at [informit.com/register](http://informit.com/register) to gain access to the Bonus KitKat chapter online. Learn how to... Quickly set up your development environment and create Android projects Use Android layouts and fragments to create apps that look great on phones, tablets, and even TVs Develop intuitive user interfaces using Android controls Access the cloud and retrieve data using the Flickr API Create a full-blown app that parses JSON, stores metadata, and displays Flickr images Use a SQLite database and content providers to create responsive, data-driven apps Write social apps using the Facebook Android SDK Use contact and calendar data Build location-based apps using LocationManager APIs or the new Google Play Location Services Internationalize your apps Work with media and cameras Use open-source libraries to add “finishing touches” Package and publish apps to Google Play and other app stores

The papers in this proceeding discuss current and future trends in wearable communications and personal health management through the use of wireless body area networks (WBAN). The authors posit new technologies that can provide trustworthy communications mechanisms from the user to medical health databases. The authors discuss not only on-body devices, but also technologies providing information in-body. Also discussed are dependable communications combined with accurate localization and behavior analysis, which will benefit WBAN technology and make the healthcare processes more effective. The papers were presented at the 13th EAI International Conference on Body Area Networks (BODYNETS 2018), Oulu, Finland, 02-03 October 2018.

Bluetooth Low Energy (BLE) is an exciting new technology

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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

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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. This book constitutes the refereed proceedings of three workshops held at the 19th International Conference on Financial Cryptography and Data Security, FC 2015, in San Juan, Puerto Rico, in January 2015. The 22 full papers presented were carefully reviewed and selected from 39 submissions. They feature the outcome of the Second Workshop on Bitcoin Research, BITCOIN 2015, the Third Workshop on Encrypted Computing and Applied Homomorphic Cryptography, WAHC 2015, and the First Workshop on Wearable Security and Privacy, Wearable 2015.

This book constitutes the proceedings of the Third EAI

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International Conference on Intelligent Transport Systems, INTSYS 2019, which was held in Braga, Portugal, in December 2019. The 23 revised full papers were selected from 35 submissions and are organized in four thematic sessions on modelling, optimization, tracking and prediction, visualization and sensing.

The book is a collection of high-quality, peer-reviewed innovative research papers from the International Conference on Signals, Machines and Automation (SIGMA 2018) held at Netaji Subhas Institute of Technology (NSIT), Delhi, India. The conference offered researchers from academic and industry the opportunity to present their original work and exchange ideas, information, techniques and applications in the field of computational intelligence, artificial intelligence and machine intelligence. The book is divided into two volumes discussing a wide variety of industrial, engineering and scientific applications of the emerging techniques.

Exploit and defend against the latest wireless network attacks  
Learn to exploit weaknesses in wireless network environments using the innovative techniques in this thoroughly updated guide. Inside, you'll find concise technical overviews, the latest attack methods, and ready-to-deploy countermeasures. Find out how to leverage wireless eavesdropping, break encryption systems, deliver remote exploits, and manipulate 802.11 clients, and learn how attackers impersonate cellular networks. Hacking Exposed Wireless, Third Edition features expert coverage of ever-expanding threats that affect leading-edge technologies, including Bluetooth Low Energy, Software Defined Radio (SDR), ZigBee, and Z-Wave. Assemble a wireless attack toolkit and master the hacker's weapons Effectively scan and enumerate WiFi networks and client devices Leverage advanced wireless attack tools, including Wifite, Scapy, Pyrit, Metasploit, KillerBee, and the Aircrack-ng suite Develop and

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launch client-side attacks using Ettercap and the WiFi Pineapple Hack cellular networks with Airprobe, Kraken, Pytacle, and YateBTS Exploit holes in WPA and WPA2 personal and enterprise security schemes Leverage rogue hotspots to deliver remote access software through fraudulent software updates Eavesdrop on Bluetooth Classic and Bluetooth Low Energy traffic Capture and evaluate proprietary wireless technology with Software Defined Radio tools Explore vulnerabilities in ZigBee and Z-Wave-connected smart homes and offices Attack remote wireless networks using compromised Windows systems and built-in tools Learn to rapidly build and deploy cross-platform applications from a single codebase with practical, real-world solutions using the mature Delphi 10.4 programming environment Key Features Implement Delphi's modern features to build professional-grade Windows, web, mobile, and IoT applications and powerful servers Become a Delphi code and project guru by learning best practices and techniques for cross-platform development Deploy your complete end-to-end application suite anywhere Book Description Delphi is a strongly typed, event-driven programming language with a rich ecosystem of frameworks and support tools. It comes with an extensive set of web and database libraries for rapid application development on desktop, mobile, and internet-enabled devices. This book will help you keep up with the latest IDE features and provide a sound foundation of project management and recent language enhancements to take your productivity to the next level. You'll discover how simple it is to support popular mobile device features such as sensors, cameras, and GPS. The book will help you feel comfortable working with FireMonkey and styles and incorporating 3D user interfaces in new ways. As you advance, you'll be able to build cross-platform solutions that not only look native but also take advantage of a wide array

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of device capabilities. You'll also learn how to use embedded databases, such as SQLite and InterBase ToGo, synchronizing them with your own custom backend servers or modules using the powerful RAD Server engine. The book concludes by sharing tips for testing and deploying your end-to-end application suite for a smooth user experience. By the end of this book, you'll be able to deliver modern enterprise applications using Delphi confidently. What you will learn

- Discover the latest enhancements in the Delphi IDE
- Overcome the barriers that hold you back from embracing cross-platform development
- Become fluent with FireMonkey controls, styles, LiveBindings, and 3D objects
- Build Delphi packages to extend RAD Server or modularize your applications
- Use FireDAC to get quick and direct access to any data
- Leverage IoT technologies such as Bluetooth and Beacons and learn how to put your app on a Raspberry Pi
- Enable remote apps with backend servers on Windows and Linux through REST APIs
- Develop modules for IIS and Apache web servers

Who this book is for This book is for Delphi developers interested in expanding their skillset beyond Windows programming by creating professional-grade applications on multiple platforms, including Windows, Mac, iOS, Android, and back-office servers. You'll also find this book useful if you're a developer looking to upgrade your knowledge of Delphi to keep up with the latest changes and enhancements in this powerful toolset. Some Delphi programming experience is necessary to make the most out of this book.

LPWAN Technologies for IoT and M2M Applications provides insight into LPWAN technologies, also presenting a wide range of applications and a discussion on security issues and future challenges and research directions. This book is a beneficial and insightful

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resource for university researchers, graduate students and R&D engineers who are designing networks and implementing IoT applications. To support new requirements for this emerging industry, a new paradigm of Low Power Wide Area Networks (LPWAN) has recently evolved, including LoRa, Sigfox and NB-IoT, hence this book presents the latest updates.

"Bluetooth (enabled devices) will ship in the billions of units once it gains momentum." - Martin Reynolds, Gartner Group Bluetooth is the most exciting development in wireless computing this decade!

Bluetooth enabled devices can include everything from network servers, laptop computers and PDAs, to stereos and home security systems. Most Bluetooth products to hit the market in 2001 will be PC cards for laptop computers and access points, which allow up to seven Bluetooth devices to connect to a network. Reports indicate that by the end of 2003 there will be over 2 billion Bluetooth-enabled devices. Bluetooth-enabled devices communicate with each other through embedded software applications. Bluetooth Developer's Guide to Embedded Applications will provide embedded applications developers with advanced tutorials and code listings written to the latest Bluetooth's latest specification, version 1.1. Written by Bluetooth pioneers from market leaders in Bluetooth software development, Extended Systems and Cambridge Silicon Radio, this is the first advanced level Bluetooth developer title on the market. White Hot Topic While other books introduce readers to the possibilities of Bluetooth, this is the first comprehensive, advanced level programming book

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written specifically for embedded application developers  
Authors are responsible for SDK, the market-leading development tool for Bluetooth Comes with Syngress' revolutionary Credit Card CD containing a printable HTML version of the book, all of the source code and sample applications from Extended Systems and Cambridge Silicon Radio

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

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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.

Several of the actual devices, such as mobile phones, use Bluetooth Low Energy, a wireless technology that is

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able to establish a connection between devices producing a low energy consumption. Therefore, in this project this technology has been applied in low resources and low consumption nodes. The objective is to analyze these nodes, know their characteristics and to be able to develop different applications in different sensor networks, for instance biological measures in human beings or environmental measures. To achieve this objective a first design was made, where the Bluetooth Low Energy was studied and the node used, the device CC1352R. Subsequently, in order to implement the pertinent functions, the code for each node was elaborated. The final scene that has been developed consists on two CC1352R devices that utilize this technology to be able to establish a connection, receive data, transfer it between nodes and store it in the central node. In this project a study of the current state of the Bluetooth Low Energy technology was elaborated, in addition to the description of the development of the functions used in the CC1352R devices. Furthermore, an experimental study was made about the lecture of data and limitations of the nodes. The study and development of this work serve as collateral to accomplish new projects, as in creating different applications related to the Internet of Things and the ability to create different kinds of sensor networks.

This document brings together a set of latest data points and publicly available information relevant for Technology Industry. We are very excited to share this content and believe that readers will benefit from this periodic publication immensely.

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Get ready to create killer apps for iPad and iPhone on the new iOS 7! With Apple's introduction of iOS 7, demand for developers who know the new iOS will be high. You need in-depth information about the new characteristics and capabilities of iOS 7, and that's what you'll find in this book. If you have experience with C or C++, this guide will show you how to create amazing apps for iPhone, iPad, and iPod touch. You'll also learn to maximize your programs for mobile devices using iPhone SDK 7.0. Advanced topics such as security services, running on multiple iPlatforms, and local networking with Core Bluetooth are also covered.

Prepares experienced developers to create great apps for the newest version of Apple's iOS Thoroughly covers the serious capabilities of iOS 7; information you need in order to make your apps stand out Delves into advanced topics including how to control multitasking, security services, running apps on multiple iPlatforms and iDevices, enabling in-app purchases, advanced text layout, and building a core foundation Also covers REST, advanced GCD, internationalization and localization, and local networking with Core Bluetooth iOS 7

Programming: Pushing the Limits will help you develop applications that take full advantage of everything iOS 7 has to offer.

Bluetooth Low EnergyThe Developer's HandbookPrentice Hall

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

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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

The two-volume set LNICST 169 and 170 constitutes the thoroughly refereed post-conference proceedings of the Second International Internet of Things Summit, IoT 360° 2015, held in Rome, Italy, in October 2015. The IoT 360° is an event bringing a 360 degree perspective on IoT-related projects in important sectors such as mobility, security, healthcare and urban spaces. The conference also aims to coach involved people on the whole path between research to innovation and the way through to commercialization in the IoT domain. This volume

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contains 61 revised full papers at the following four conferences: International Conference on IoT as a Service, IoTaaS, International Conference on Mobility in IoT, Mobility IoT, International Conference on Sensor Systems and Software, S-Cube, International Conference on Interoperability in IoT, InterioT, International Conference on Software Defined and Virtual Future Wireless Networks, SDWNCT.

Ineffective discharge management can jeopardize the successful completion of hospital treatment; but a well managed transition from hospital care to care at home depends on the efficient exchange of information with out-patient healthcare providers and professionals. This is just one way in which ICT can support healthcare and provide tools which help health professions to identify and communicate relevant data. Such tools will be increasingly important in future healthcare systems, and indeed a Europe-wide ICT infrastructure for information and data exchange may do much to revolutionize the quality of healthcare. It is therefore essential that infrastructures build on well-established standards such as Integrating the Healthcare Enterprise (IHE), even if this initially takes longer to implement. This book presents the proceedings of the annual Health Informatics meets eHealth conference, held in Vienna, Austria, in May 2017. The special topic chosen for eHealth2017 is Digital Insight –

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Information-Driven Health & Care, and the conference addressed the increasingly international focus of eHealth and the importance of cross-border health ICT. The papers presented here cover many eHealth topics, from maternity records to rehabilitation and from staff training to information exchange. Future ICT systems will inevitably involve machine learning and predictive analytics in order to provide actionable information to health professionals and support preventive healthcare concepts, and this book provides an insight into current research in health informatics and eHealth, addressing many issues central to the future of health and care. The book will be of interest to all healthcare researchers and practitioners.

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.

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Bluetooth Technology gave people the freedom to use electronic devices without getting hung up on the wires and cables. However, Bluetooth Low Energy technology with its different design architecture enables us to take advantage of a wide variety of different applications that were impossible with classic Bluetooth. [1][8] In this paper, a design process for creating communication between a Bluetooth Low Energy device and a smart phone is presented. In addition, some background information about the Bluetooth Low Energy technology is discussed. To develop the Bluetooth Low Energy communication, the Bluetooth Low Energy (BLE112) and its development board (DKBLE112) by Bluegiga, and the Bluegiga scripting language (BGScript) are used. Also, by utilizing Objective C language, Xcode (Apple Development Tool), and the iPhone 5s, an iOS App was developed that acts as the user interface between the iPhone and the Bluetooth Low Energy. This project is intended to be used in a larger project that will detect the stress level of a person.

This book documents the state of the art in the field of ambient assisted living (AAL), highlighting the impressive potential of novel methodologies and technologies to enhance well-being and promote active ageing. The coverage is wide ranging, with sections on care models and algorithms, enabling technologies and assistive solutions, elderly people

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monitoring, home rehabilitation, ICT solutions for AAL, living with chronic conditions, robotic assistance for the elderly, sensing technologies for AAL, and smart housing. The book comprises a selection of the best papers presented at the 9th Italian Forum on Ambient Assisted Living (ForitAAL 2018), which was held in Lecce, Italy, in July 2018 and brought together end users, technology teams, and policy makers to develop a consensus on how to improve provision for elderly and impaired people. Readers will find that the expert contributions offer clear insights into the ways in which the most recent exciting advances may be expected to assist in addressing the needs of the elderly and those with chronic conditions.

Master the skills required to steer cross-platform applications from drawing board to app store(s) using Xamarin About This Book Develop your Xamarin development skills with this comprehensive guide on various patterns and features so you can create elegant and high-quality applications Create adaptive user interfaces on separate platforms without compromising the user experience and platform identity Implement application lifecycle management concepts to manage and finalize cross-platform projects and efficiently collaborate with others Who This Book Is For This book is ideal for those who want to take their entry-level Xamarin mobile development skills to the next level to

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become the go-to person within their organization.

To fully understand the patterns and concepts described, you should possess a reasonable level of knowledge about the core elements of Xamarin and cross-platform application development with it. What You Will Learn Configure your environment for cross-platform projects with Xamarin Gain memory management skills to avoid memory leaks and premature code cycles while decreasing the memory print of your applications Employ asynchronous and parallel patterns to execute non-interactive and non-blocking processes Create and use SQLite databases for offline scenarios Integrate network resources with cross-platform applications Design and implement eye-catching and reusable UI components without compromising nativity in mobile applications Manage the application lifecycle of cross-platform development projects Distribute Xamarin applications through public or private channels In Detail The main goal of this book is to equip you with the required know-how to successfully analyze, develop, and manage Xamarin cross-platform projects using the most efficient, robust, and scalable implementation patterns. This book starts with general topics such as memory management, asynchronous programming, local storage, and networking, and later moves onto platform-specific features. During this transition, you will learn about key tools to leverage the patterns

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described, as well as advanced implementation strategies and features. The book also presents User Interface design and implementation concepts on Android and iOS platforms from a Xamarin and cross-platform perspective, with the goal to create a consistent but native UI experience. Finally, we show you the toolset for application lifecycle management to help you prepare the development pipeline to manage and see cross-platform projects through to public or private release. **Style and approach** This is a comprehensive guide on various Xamarin features and patterns. Each topic is explained and demonstrated with code samples, which are revised in each section in an iterative manner and analyzed with available diagnostic tools to demonstrate the benefits of different patterns.

This book constitutes the thoroughly refereed proceedings of the 10th EAI International Conference on e-Infrastructure and e-Services for Developing Countries, AFRICOMM 2018, held in Dakar, Senegal, in November 2018. The 28 full papers were carefully selected from 49 submissions. The accepted papers provide a wide range of research topics including e-health, environment, cloud, VPN and overlays, networks, services, e-Learning, agriculture, IoT, social media, mobile communication and security.

Bluetooth Low Energy (LE) is one of the latest enhancement to Bluetooth technology and, as the

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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.

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

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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.

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

The First Complete Guide to Bluetooth Low Energy: How It Works, What It Can Do, and How to Apply It A radical

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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

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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

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

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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.

Build a complete, professional-quality, hybrid mobile application with Ionic About This Book Develop high-grade and performance-optimized hybrid applications using the latest version of Ionic Discover the latest and upcoming features of Ionic A practical guide that will help you fully utilize all the features and components of Ionic efficiently Who This Book Is For The target audience for this book is intermediate-level application developers who have some basic knowledge of Ionic. What You Will Learn Use every Ionic component and its customization according to the application along with some important third party components Recently released Lazy Loading and Grid System supporting desktop application with Electron Integration of the various Ionic backend services and features such as Ionic Push, DB, Auth, Deploy in your application Exploration of white-listing, CORS, and various other platform security aspects to secure your application Synchronization of your data with the cloud server and

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fetching it in real time using Ionic Cloud and Firebase services Integration of the Cordova iBeacon plugin which will fetch contextual data on the basis of location and Websockets for real time communication for IOT based applications Implementation of offline functionality in your PWA application using service-worker, cache storage and indexedDB In Detail Ionic is an open source, front-end framework that allows you to develop hybrid mobile apps without any native-language hassle for each platform. It offers a library of mobile-optimized HTML, CSS, and JS components for building highly interactive mobile apps. This book will help you to develop a complete, professional and quality mobile application with Ionic Framework. You will start the journey by learning to configure, customize, and migrate Ionic 1x to 3x. Then, you will move on to Ionic 3 components and see how you can customize them according to your applications. You will also implement various native plugins and integrate them with Ionic and Ionic Cloud services to use them optimally in your application. By this time, you will be able to create a full-fledged e-commerce application. Next, you will master authorization, authentication, and security techniques in Ionic 3 to ensure that your application and data are secure. Further, you will integrate the backend services such as Firebase and the Cordova iBeacon plugin in your application. Lastly, you will be looking into Progressive Web Applications and its support with Ionic, with a demonstration of an offline-first application. By the end of the book, you will not only have built a professional, hybrid mobile application, but will also have ensured that your app is secure and performance driven. Style and approach A step-by-step guide (covering all its features and components) to build a complete mobile application using Ionic. Each chapter will cover different features of Ionic.

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