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MOS Devices for Low-Voltage and Low-Energy Applications **Inside Bluetooth Low Energy Security Designs for the Cloud, IoT, and Social Networking** **Getting Started with Bluetooth Low Energy iOS 10 SDK Development** **Inside Bluetooth Low Energy, Second Edition** **Senate documents** *Programme of subjects to be considered by the International marine conference ; Detailed programme of subjects to be considered by the International marine conference ; Protocol December 2-December 31, 1889 ; Final Act ; Annex 1. Act of Congress (Public, no. 167) ; Annex 2. Act of Congress (Public resolution no. 3) ; Annex 3-6. Letters of invitation ; Detailed programme of subjects to be considered by the International marine conference ; Annex 7. List of delegates ; Appendix* **iPhone: The Missing Manual** **Ferroelectric Devices** **Make: Bluetooth** **Building Bluetooth Low Energy Systems** **Intro to Bluetooth Low Energy** **Interface Integrated Circuits** **Bluetooth Low Energy in Android Java** **History of Central America ... The Works of Hubert Howe Bancroft: History of Central America. 1886-1887** **Scanning Probe Microscopy: Characterization, Nanofabrication and Device Application of Functional Materials** **Floating Gate Devices: Operation and Compact Modeling** **Optoelectronic Devices** **How to Build and Use Electronic Devices Without Frustration, Panic, Mountains of Money, Or an Engineering Degree** **Bluetooth Low Energy IoT Design of Medical Electronic Devices** **Nitride Semiconductors and Devices** **Noise in Solid State Devices and Circuits** **Insulating Materials for Optoelectronics: New Developments** **Microwave Semiconductor Devices** **IoT Projects with Bluetooth Low Energy** **Internet of Things in Biomedical Engineering** **Applications of Circulation Control Technologies** **Bluetooth Low Energy in iOS** **Swift Electronic Devices and Components** *Bibliotheca Sunderlandiana Ontario Government Publications* **Bluetooth Tutorial** **Inside Bluetooth Low Energy** **Electronics** **Semiconductor Power Devices** **Complete Guide to Semiconductor Devices**

Acknowledgments -- Introduction -- 1 Proper Design of Power Subsystems in Medical Electronics -- 2 Fundamentals of Magnetic Resonance Imaging -- 3 Particle Accelerator Design -- 4 Sensor Characteristics -- 5 Data Acquisition -- 6 Noise and Interference Issues in Analog Circuits -- 7 Hardware Approach to Digital Signal Processing -- 8 Optical Sensors -- Index. Cumulates monthly issues and includes additional material. This review volume presents new developments in the preparation, physical characterization and applications of insulating materials for Optoelectronics. Insulators occupy a leading position as laser and optical amplifier hosts, electrooptic and acoustooptic modulators, frequency doublers and optical parametric oscillators, photorefractive devices and radiator detectors. These applications rely heavily on the development of advanced techniques for the preparation of both bulk and waveguide structures, the adequate knowledge of the microscopic behaviour defects, impurities and a thorough understanding of their response to electromagnetic fields. All these topics relating basic physicochemical aspects and applied performance are authoritatively discussed in the book. Contents: Pulsed Laser Deposition of Films for Optical Applications (C N Afonso) Preparation of Single Crystal Fibers (W M Yen) Preparation and Characterization of Composite Materials: Organic Molecules in Inorganic Hosts (D Levy) Characterization of Point Defects in Photorefractive Oxide Crystals by Paramagnetic Resonance Methods (O F Schirmer et al.) Hyperfine Techniques for Defect Studies (R Vianden) Optical Characterization of Solid State Lasers (L E Bausa & J G Sole) Channeling Investigations of Oxide Materials for Optoelectronic Applications (A Kling et al.) X-Ray Standing Wave Determination of Lattice Positions of Impurities in Lithium Niobate (T Gog & G Materlik) New Developments in the Simulation of Electrooptic Oxides (H Donnenberg) The Photorefractive Effect in Crystals (C Medrano & P Günter) Holographic Memories with Photorefractive Materials (C Alves et al.) Proton Exchange Waveguides in LiNbO₃ and LiTaO₃: Structural and Optical Properties (M P De Micheli et al.) Glasses for Optoelectronic Devices (P Mazzoldi & G C Righini) Application of Ion Implantation for Optoelectronics and Photonics (P D Townsend) Semiinsulating Material for Radiation Detection: HgI₂ (E Diéguez & P Olmos) Readership: Materials scientists, physicists and engineers. keywords: Laser Heated Pedestal Growth (LHPG); Single Crystals; Crystal Fibers; Optoelectronics; Materials; Insulators; Electrooptics; Lithium Niobate; Waveguides; Photorefractives; Lasers; Defects; Optics; Single Crystal Fibers; Pulsed Laser Deposition; Solid State Lasers; Photorefractive Materials; Composite Materials; Hyperfine Techniques; Holographic Memories; Ion Implantation; Light Waveguides; Optoelectronic Devices Based on papers from the 2004 NASA/ONR Circulation Control Workshop, this collection is an invaluable, one-of-a-kind resource on the state of the art in circulation control technologies and applications. Filling the information gap between 1986 -- when the last such symposium was held -- and today, it summarizes the applications, experiments, computations and theories related to circulation control, emphasizing fundamental physics, systems analysis and applied research. The papers presented cover a wide variety of aerodynamic and hydrodynamic applications including naval vehicles, fixed-wing aviation, V/STOL platforms, propulsion systems and ground vehicles. Anyone with interests in applied aerodynamics, fluid mechanics and aircraft design will find this book of particular value, as will those seeking an up-to-date reference work on circulation control and its many current applications. Floating Gate Devices: Operation and Compact Modeling focuses on standard operations and compact modeling of memory devices based on Floating Gate architecture. Floating Gate devices are the building blocks of Flash, EPROM, EEPROM memories. Flash memories, which are the most versatile nonvolatile memories, are widely used to store code (BIOS, Communication protocol, Identification code,) and data (solid-state Hard Disks, Flash cards for digital cameras,). The reader, who deals with Floating Gate memory devices at different levels - from test-structures to complex circuit design - will find an essential explanation on device physics and technology, and also circuit issues which must be fully understood while developing a new device. Device engineers will use this book to find simplified models to design new process steps or new architectures. Circuit designers will find the basic theory to understand the use of compact models to validate circuits against process variations and to evaluate the impact of parameter variations on circuit performances. Floating Gate Devices: Operation and Compact Modeling is meant to be a basic tool for designing the next generation of memory devices based on FG technologies. 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 "Bluetooth Low Energy (LE) is one of the latest enhancements to Bluetooth technology and, as the name suggests, it is aimed at ultra low power devices, such as heart rate monitors, thermometers, and sensors. Due to very low power consumption, devices compliant with this standard can operate for several 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. You also find discussions on Bluetooth basics, providing the background information needed to master Bluetooth LE"--Back cover. A definitive and up-to-date handbook of semiconductor devices Semiconductor devices, the basic components of integrated circuits, are responsible for the rapid growth of the electronics industry over the past fifty years. Because there is a growing need for faster and more complex systems for the information age, existing semiconductor devices are constantly being studied for improvement, and new ones are being continually invented. As a result, a large number of types and variations of devices are available in the literature. The Second Edition of this unique engineering guide continues to be the only available complete collection of semiconductor devices, identifying 74 major devices and more than 200 variations of these devices. As in the First Edition, the value of this text lies in its comprehensive, yet highly readable presentation and its easy-to-use format, making it suitable for a wide range of audiences. Essential information is presented for a quick, balanced overview Each chapter is designed to cover only one specific device, for easy and focused reference Each device is discussed in detail, always including its history, its structure, its characteristics, and its applications The Second Edition has been significantly updated with eight new chapters, and the material rearranged to reflect recent developments in the field. As such, it remains an ideal reference source for graduate students who want a quick survey of the field, as well as for practitioners and researchers who need quick access to basic information, and a valuable pragmatic handbook for salespeople, lawyers, and anyone associated with the semiconductor industry. Gives basic and up-to-date information about noise sources in electronic devices. Demonstrates how this information can be used to calculate the noise performance, in particular the noise figure, of electronic circuits using these devices. Optimization procedures, both for the circuits and for the devices, are then devised based on these data. Gives an elementary treatment of thermal noise, diffusion noise, and velocity-fluctuation noise, including quantum effects in thermal noise and maser noise. 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. With the iOS 8.1 software and the new iPhone 6 and 6 Plus, Apple has taken its flagship products into new realms of power and beauty. The modern iPhone comes with everything—camera, music player, Internet, flashlight—except a printed manual. Fortunately, David Pogue is back with this expanded edition of his witty, full-color guide: the world's most popular iPhone book. The iPhone 6 and 6 Plus. This book unearths all the secrets of the newest iPhones. Bigger screens, faster chips, astonishing cameras, WiFi calling, Apple Pay, crazy thin. The iOS 8.1 software. Older iPhone models gain predictive typing, iCloud Drive, Family Sharing, "Hey Siri," the Health app, and about 195 more new features. It's all here, in these pages. The apps. That catalog of 1.3 million add-on programs makes the iPhone's phone features almost secondary. Now you'll know how to find, exploit, and troubleshoot those apps. The iPhone may be the world's coolest computer, but it's still a computer, with all of a computer's complexities. iPhone: The Missing Manual is a funny, gorgeously illustrated guide to the tips, shortcuts, and workarounds that will turn you, too, into an iPhone master. 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 timely monograph addresses an important class of semiconductors and devices that constitute the underlying technology for blue lasers. It succinctly treats structural, electrical and optical properties of nitrides and

the substrates on which they are deposited, band structures of nitrides, optical processes, deposition and fabrication technologies, light-emitting diodes, and lasers. It also includes many tables and figures detailing the properties and performance of nitride semiconductors and devices. This book is where your adventures with Bluetooth LE begin. You'll start your journey by getting familiar with your hardware options: Arduino, BLE modules, computers (including Raspberry Pi!), and mobile phones. From there, you'll write code and wire circuits to connect off-the-shelf sensors, and even go all the way to writing your own Bluetooth Services. Along the way you'll look at lightbulbs, locks, and Apple's iBeacon technology, as well as get an understanding of Bluetooth security-- both how to beat other people's security, and how to make your hardware secure. 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. Internet of Things in Biomedical Engineering presents the most current research in Internet of Things (IoT) applications for clinical patient monitoring and treatment. The book takes a systems-level approach for both human-factors and the technical aspects of networking, databases and privacy. Sections delve into the latest advances and cutting-edge technologies, starting with an overview of the Internet of Things and biomedical engineering, as well as a focus on 'daily life.' Contributors from various experts then discuss 'computer assisted anthropology,' CLOUDFALL, and image guided surgery, as well as bio-informatics and data mining. This comprehensive coverage of the industry and technology is a perfect resource for students and researchers interested in the topic. Presents recent advances in IoT for biomedical engineering, covering biometrics, bioinformatics, artificial intelligence, computer vision and various network applications Discusses big data and data mining in healthcare and other IoT based biomedical data analysis Includes discussions on a variety of IoT applications and medical information systems Includes case studies and applications, as well as examples on how to automate data analysis with Perl R in IoT 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 Bluetooth Low Energy (BLE) is an exciting new technology that was introduced in 2010. It targets applications in the Internet of Things (IoT) space. With the recent release of Bluetooth 5 in late 2016 and Bluetooth mesh in mid-2017 (which builds on top of BLE), Bluetooth is now more capable than ever of becoming the standard wireless protocol used in many IoT applications including: smart homes, smart cities, medical devices, wearables, and sensor connectivity. Learning a new technology is always challenging and usually comes with a learning curve. Some technologies are easier to learn than others. Unfortunately, Bluetooth Low Energy (BLE) can be one of those hard ones. The lack of good resources including blogs, tutorials, and up-to-date books that help a beginner to learn BLE, makes the task even more difficult. That is, in fact, the primary goal of this book: to provide you with a complete understanding of the basics and core concepts of BLE that you can learn in a single weekend. Here's a tiny list of the benefits this book will help you achieve:

Understand what Bluetooth Low Energy is and how it compares to Bluetooth Classic. Become better informed about the use cases where BLE makes the most sense. Learn all about Bluetooth 5 and the new features it brought us. Understand how two BLE devices discover and connect with each other. Understand how BLE devices exchange and transfer data between each other. Fully grasp concepts such as Peripherals, Centrals, Advertising, Connections, GATT, GAP, and many others. Learn about the newly released Bluetooth mesh standard. What readers are saying "I bought your BLE book and I love it. I am an iOS developer and your material helped me understand some of the finer points of BLE" -Alex Carrizo, Senior iOS Developer, iOS SME at Mobile Apps Company

Topics include: The basics of Bluetooth Low Energy & Bluetooth 5.0. The difference between BLE and Bluetooth Classic (the one used for streaming audio and connecting headsets). The benefits and limitations of using BLE and which use cases make the most sense for BLE. The difference between a BLE Central and a BLE Peripheral. All about GATT (Generic Attribute Profile) and GAP (Generic Access Profile). How Bluetooth 5 achieves double the speed, four times the range, and eight times the advertising capacity.- How BLE devices advertise and discover each other. How two BLE devices connect to each other. How BLE devices exchange and transfer data between each other. Profiles, Services, and Characteristics. How secure BLE is, and how BLE devices secure the communication channel between them. The different connection and advertising parameters and what each of them means. An introduction to Bluetooth mesh. About the Author Mohammad Afaneh has been an embedded engineer for over 10 years. Since 2014, he has focused solely on learning and developing Bluetooth Low Energy applications. He even spent days and weeks reading through the 2,800+ page Bluetooth specification document looking for answers to questions he couldn't find answers to in other books and resources. He shares everything he knows about development for BLE technology at his website www.novelbits.io, and via training classes around the world.

IOT: Security and Privacy Paradigm covers the evolution of security and privacy issues in the Internet of Things (IoT). It focuses on bringing all security and privacy related technologies into one source, so that students, researchers, and practitioners can refer to this book for easy understanding of IoT security and privacy issues. This edited book uses Security Engineering and Privacy-by-Design principles to design a secure IoT ecosystem and to implement cyber-security solutions. This book takes the readers on a journey that begins with understanding the security issues in IoT-enabled technologies and how it can be applied in various aspects. It walks readers through engaging with security challenges and builds a safe infrastructure for IoT devices. The book helps readers gain an understand of security architecture through IoT and describes the state of the art of IoT countermeasures. It also differentiates security threats in IoT-enabled infrastructure from traditional ad hoc or infrastructural networks, and provides a comprehensive discussion on the security challenges and solutions in RFID, WSNs, in IoT. This book aims to provide the concepts of related technologies and novel findings of the researchers through its chapter organization. The primary audience includes specialists, researchers, graduate students, designers, experts and engineers who are focused on research and security related issues. Souvik Pal, PhD, has worked as Assistant Professor in Nalanda Institute of Technology, Bhubaneswar, and JIS College of Engineering, Kolkata (NAAC "A" Accredited College). He is the organizing Chair and Plenary Speaker of RICE Conference in Vietnam; and organizing co-convenor of ICICIT, Tunisia. He has served in many conferences as chair, keynote speaker, and he also chaired international conference sessions and presented session talks internationally. His research area includes Cloud Computing, Big Data, Wireless Sensor Network (WSN), Internet of Things, and Data Analytics. Vicente García-Díaz, PhD, is an Associate Professor in the Department of Computer Science at the University of Oviedo (Languages and Computer Systems area). He is also the editor of several special issues in prestigious journals such as Scientific Programming and International Journal of Interactive Multimedia and Artificial Intelligence. His research interests include eLearning, machine learning and the use of domain specific languages in different areas. Dac-Nhuong Le, PhD, is Deputy-Head of Faculty of Information Technology, and Vice-Director of Information Technology Apply and Foreign Language Training Center, Haiphong University, Vietnam. His area of research includes: evaluation computing and approximate algorithms, network communication, security and vulnerability, network performance analysis and simulation, cloud computing, IoT and image processing in biomedical. Presently, he is serving on the editorial board of several international journals and has authored nine computer science books published by Springer, Wiley, CRC Press, Lambert Publication, and Scholar Press.

Helps readers understand the physics behind MOS devices for low-voltage and low-energy applications Based on timely published and unpublished work written by expert authors Discusses various promising MOS devices applicable to low-energy environmental and biomedical uses Describes the physical effects (quantum, tunneling) of MOS devices Demonstrates the performance of devices, helping readers to choose right devices applicable to an industrial or consumer environment Addresses some Ge-based devices and other compound-material-based devices for high-frequency applications and future development of high performance devices.

"Seemingly innocuous everyday devices such as smartphones, tablets and services such as on-line gaming or internet keyword searches consume vast amounts of energy. Even when in standby mode, all these devices consume energy. The upcoming 'Internet of Things' (IoT) is expected to deploy 60 billion electronic devices spread out in our homes, cars and cities. Britain is already consuming up to 16 per cent of all its power through internet use and this rate is doubling every four years. According to The UK's Daily Mail May (2015), if usage rates continue, all of Britain's power supply could be consumed by internet use in just 20 years. In 2013, U.S. data centers consumed an estimated 91 billion kilowatt-hours of electricity, corresponding to the power generated by seventeen 1000-megawatt nuclear power plants. Data center electricity consumption is projected to increase to roughly 140 billion kilowatt-hours annually by 2020, the equivalent annual output of 50 nuclear power plants." —Natural Resources Defense Council, USA, Feb. 2015

All these examples stress the urgent need for developing electronic devices that consume as little energy as possible. The book "MOS Devices for Low-Voltage and Low-Energy Applications" explores the different transistor options that can be utilized to achieve that goal. It describes in detail the physics and performance of transistors that can be operated at low voltage and consume little power, such as subthreshold operation in bulk transistors, fully depleted SOI devices, tunnel FETs, multigate and gate-all-around MOSFETs. Examples of low-energy circuits making use of these devices are given as well. "The book MOS Devices for Low-Voltage and Low-Energy Applications is a good reference for graduate students, researchers, semiconductor and electrical engineers who will design the electronic systems of tomorrow." —Dr. Jean-Pierre Colinge, Taiwan Semiconductor Manufacturing Company (TSMC) "The authors present a creative way to show how different MOS devices can be used for low-voltage and low-power applications. They start with Bulk MOSFET, following with SOI MOSFET, FinFET, gate-all-around MOSFET, Tunnel-FET and others. It is presented the physics behind the devices, models, simulations, experimental results and applications. This book is interesting for researchers, graduate and undergraduate students. The low-energy field is an important topic for integrated circuits in the future and none can stay out of this."

—Prof. Joao A. Martino, University of Sao Paulo, Brazil All in on Swift! iOS 10 and Xcode 8 make it clearer than ever that Swift is Apple's language of the future. Core frameworks have been redesigned to work better with Swift, and the language itself continues to evolve quickly. iOS 10 SDK Development is the pure-Swift approach to developing for the iOS platform. This completely revised and updated edition of the bestselling iOS guide shows you how to pull in the SDK's enormous feature set and deliver powerful, real-world apps for iPhone and iPad using modern Swift programming techniques. Swift is the language of the future for iOS development, and this completely revised and updated book is your guide. From the community-driven changes in Swift 3 to the overhaul of iOS' Foundation framework to make it more "Swiftly," iOS 10 and Xcode 8 mark an "all in" commitment to Swift, and this new edition matches that commitment. Learn not just the syntax of the Swift language but also stylish Swift, the idiomatic uses of the language, and best practices you'll find in the wild. From there, move into developing a complete, real-world podcast client sample application—completely new for this edition—featuring Internet access, tables, navigation, and media playback, all with the most modern approaches provided by Apple's iOS 10 frameworks and tools. Go beyond code to master the practices that professional developers rely on: testing, debugging, publishing on the App Store, and managing your app over the long haul. As a bonus, you'll get a taste of cutting-edge iOS 10 features, such as the new Siri voice-command API. Swift's time is here. Whether you're new to Swift or just catching up on iOS' latest features, iOS 10 SDK Development will help you master the language and the platform.

Bluetooth Tutorial: Design, Protocol and Specifications for BLE - Bluetooth Low Energy 4.0 and Bluetooth 5' starts from the ground up for a new user and does a gradual progression into the technical details around Bluetooth technology. The latest update adds information about Bluetooth 4.0 also known as Bluetooth Low Energy (BLE) and Bluetooth 5.0. Introduction Bluetooth is the name given to a new technology standard using short-range radio links, intended to replace the cables) connecting portable and/or fixed electronic devices. The standard defines a uniform structure for a wide range of devices to communicate with each other, with minimal user effort. Bluetooth key features are robustness, low complexity, low power and low cost. The technology also offers wireless access to LANs, PSTN, the mobile phone network and the Internet for a host of home appliances and portable handheld interfaces. The immediate need for Bluetooth came from the desire to connect peripherals and devices without cables. The available technology-IrDA OBEX (Infrared Data Association Object Exchange Protocol) is based in infrared links that are limited to line of sight connections. Bluetooth is further fueled by the demand for mobile and wireless access to LANs, Internet over mobile and other existing networks, where the backbone is wired but the interface is free to move. This not only makes the network easier to use but also extends its reach. What is inside Overview on Wireless Technologies, Usage Scenarios and related Taxonomy Bluetooth Architecture: Protocol Stack, Baseband, Link Manager Protocol, Logical Link Control and Adaptation, Service Discovery, Cable Replacement, Telephony Bluetooth Adopted Protocols: PPP, TCP/UDP/IP, OBEX, Content Formats, WAP Bluetooth Usage Models: File Transfer, Synchronization, Three-in-One Phone, Ultimate Headset Bluetooth Specifications: Bluetooth 1.0 and 1.0B, Bluetooth 1.1, Bluetooth 1.2, Bluetooth 2.0 + EDR, Bluetooth 2.1 + EDR, Bluetooth 3.0 + HS, Bluetooth 4.0 + LE (Bluetooth Low Energy), Bluetooth 4.1, Bluetooth 4.2, Bluetooth 5 Bluetooth Connection Establishment, Bluetooth Security Zigbee: Architecture, Zigbee Device Types, Zigbee Network Model We have reached the double conclusion: that invention is choice, that this choice is imperatively governed by the sense of scientific beauty. Hadamard (1945), Princeton University Press, by permission. The great majority of all sources and amplifiers of microwave energy, and all devices for receiving or detecting microwaves, use a semiconductor active element. The development of microwave semiconductor devices, described in this book, has proceeded from the simpler, two-terminal, devices such as GUNN or IMPATT devices, which originated in the 1960s, to the sophisticated monolithic circuit MESFET three-terminal active elements, of the 1980s and 1990s. The microwave field has experienced a renaissance in electrical engineering departments in the last few years, and much of this growth has been associated with microwave semiconductor devices. The University of Massachusetts has recently developed a well recognized program in microwave engineering. Much of the momentum for this program has been provided by interaction with industrial companies, and the influx of a large number of industry-supported students. This program had a need for a course in microwave semiconductor devices, which covered the physical aspects, as well as the aspects of interest to the engineer who incorporates such devices in his designs. It was also felt that it would be important to introduce the most recently developed devices (HFETs, HBTs, and other advanced devices) as early as possible. 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. Bluetooth Low Energy (LE) is one of the latest enhancement to Bluetooth technology and, as the name suggests, it is aimed at ultra low power devices, such as heart rate monitors, thermometers, and laboratory sensors. Due to very low power consumption, devices compliant with this standard can operate for months or even years on coin cell batteries without the need for recharging. This cutting-edge book helps you understand the whats, whys, and hows of Bluetooth LE. It includes a broad view of the technology, identifies the various building blocks and explains how they come together. The book explains the architecture of Bluetooth LE stack and the functionality provided by each of the layers. You find expert guidance in setting up your own system in a quick and efficient manner with inexpensive, easily available hardware and just a couple of PCs running Linux. Additionally, this practical volume features exercises and sample programs to help you get a first-hand feel for how the technology works. Security concerns around the rapid growth and variety of devices that are controlled and managed over the Internet is an immediate potential threat to all who own or use them. This book examines the issues surrounding these problems, vulnerabilities, what can be done to solve the problems, investigating the roots of the problems and how programming and attention to good security practice can combat the threats today that are a result of lax security processes on the Internet of Things, cloud computing and social media. 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. Tremendous progress has been made in the last few years in the growth, doping and processing technologies of the wide bandgap semiconductors. As a result, this class of materials now holds significant promise for semiconductor electronics in a broad range of applications. The principal driver for the current revival of interest in III-V Nitrides is their potential use in high power, high temperature, high frequency and optical devices resistant to radiation damage. This book provides a wide number of optoelectronic applications of III-V nitrides and covers the entire process from growth to devices and applications making it essential reading for those working in the semiconductors or microelectronics. Broad review of optoelectronic applications of III-V nitrides A comprehensive introduction to the fundamentals of ferroelectrics, including available materials, device designs, drive/control techniques, and essential applications - examining high-permittivity dielectrics, piezoelectric devices, pyroelectric sensors, and electro-optic devices. It focuses on highly adaptive polycrystalline ceramics and other materials used in thin/thick film devices. The book features the author's exclusive device development method.

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