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**Smart Buildings Digitalization** Springer
This book is a detailed compendium of these major advancements focusing exclusively on the emerging broadband wireless communication technologies which support broadband wireless data rate transmissions. Editor: Jan Nikodem, La Trobe University, Melbourne, Australia.

Neonatal Monitoring Technologies: Design for Integrated Solutions CRC Press
Wireless Body Area Networks (WBANs) are expected to promote new applications for the ambulatory health monitoring of chronic patients and elderly population, aiming to improve their quality of life and independence. These networks are composed by wireless sensor nodes (WSNs) used for measuring physiological variables (e.g., glucose level in blood or body temperature) or controlling therapeutic devices (e.g., implanted insulin pumps). These nodes should exhibit a high degree of energy autonomy in order to extend their battery lifetime or even make the node supply to rely on harvesting techniques. Typically, the power budget of WSNs is dominated by the wireless link and, hence, many efforts have been directed during the last years toward the implementation of power efficient transceivers. Because of the short range (typically no more than a few meters) and low data rate (typically in between 10 kb/s and 1 Mb/s), simple communication protocols can be employed. One of these protocols, specifically tailored for WBAN applications, is the Bluetooth low energy (BLE) standard. This book describes the challenges and solutions for the design of ultra-low power transceivers for WBANs applications and presents the implementation details of a BLE transceiver prototype. Coverage includes not only the main concepts and architectures for achieving low power consumption, but also the details of the circuit design and its implementation in a standard CMOS technology.

**Human Bond Communication** Springer
**The internet is established in most households worldwide and used for entertainment purposes, shopping, social networking, business activities, banking, telemedicine, and more. As more individuals and businesses use this essential tool to connect with each other and consumers, more private data is exposed to criminals ready to exploit it for their gain. Thus, it is essential to continue discussions involving policies that regulate and monitor these activities, and anticipate new laws that should be implemented in order to protect users. Cyber Law, Privacy, and Security: Concepts, Methodologies, Tools, and Applications examines current internet and data protection laws and their impact on user experience and cybercrime, and explores the need for further policies that protect user identities, data, and privacy. It also offers the latest methodologies and applications in the areas of digital security and threats. Highlighting a range of topics such as online privacy and security, hacking, and online threat protection, this multi-volume book is ideally designed for IT specialists, administrators, policymakers, researchers, academicians, and upper-level students.**

Design Planning and Applications River Publishers
This book constitutes the refereed proceedings of the First International Conference on Wireless Sensor Networks for Developing Countries, WSN4DC 2013, held in Jamshoro, Pakistan, in April 2013. The 10 revised full papers presented were carefully reviewed and selected from 30 submissions. The papers are organized in topical sections on WSN applications/services for developing countries; mobile WSN; underwater WSN; VANETS; body area networks; energy harvesting in WSN; WSN and cloud integration; WSN and IoT; QoS and Qot; WSN MAC, network and transport protocols; cross layer approaches; security aspects in WSN; WSN applications in smart grid and energy management; WSN in structural health monitoring.

Body Area Communications Stylus Publishing, LLC
Biosensors and systems in the form of wearables and “ nearables ” (i.e., everyday sensorized objects with transmitting capabilities such as smartphones) are rapidly evolving for use in healthcare. Unlike conventional approaches, these technologies can enable seamless or on-demand physiological monitoring, anytime and anywhere. Such monitoring can help transform healthcare from the current reactive, one-size-fits-all, hospital-centered approach into a future proactive, personalized, decentralized structure. Wearable and nearable biosensors and systems have been made possible through integrated innovations in sensor design, electronics, data transmission, power management, and signal processing. Although much progress has been made in this field, many open challenges for the scientific community remain, especially for those applications requiring high accuracy. This book contains the 12 papers that constituted a recent Special Issue of Sensors sharing the same title. The aim of the initiative was to provide a collection of state-of-the-art investigations on wearables and nearables, in order to stimulate technological advances and the use of the technology to benefit healthcare. The topics covered by the book offer both depth and breadth pertaining to wearable and nearable technology. They include new biosensors and data transmission techniques, studies on accelerometers, signal processing, and cardiovascular monitoring, clinical applications, and validation of commercial devices.

Springer
Wireless body area network (WBAN) is a small-scaled network that operates inside, on, or in the peripheral proximity of a body. The strong demands from both the medical and healthcare society and the consumer electronics industry have been accelerating the development of WBAN. WBAN is expected to be one of the main technologies to provide extremely high convenience and high efficiency in assisting healthcare or medical services. From the consumer electronics' point of view, WBAN is also of great interest in providing body-centric electronics for leisure, entertainment, game control, etc. Recent technological advances in low-power microelectronics, miniaturization, and wireless networking enable the design and proliferation of WBAN. However, engineers and designers of WBAN may face a number of challenging tasks such as regulatory circumstance, channel model, low power consumption, thermal effect, antenna and body loss, high-efficiency radios, reasonable data rate, high reliability, and efficient medium access. Wireless Body Area Network addresses various aspects of WBAN including: * Regulations * Antenna, Body Tissues and Radio Propagation * Physical Layer Technologies * Medium Access Control * Standardization The objective of this book is to provide sound understanding of the basic concepts, characteristics, and technologies of the new fast growing WBAN system. It investigates and summarizes frequency regulations on candidate frequency bands, such as ultra wideband (UWB), industrial, scientific, and medical (ISM), medical implant communication service (MICS), and wireless medical telemetry system (WMTS), in different countries and regions. The text describes antenna, propagation, and channel modeling related to WBAN, and it addresses the effects of radio frequency on tissues and organs and the effects of human tissues on RF propagations. Physical (PHY) layer technologies, including both narrow band and UWB are illustrated. Medium access control (MAC) technologies for WBAN are discussed, and a unified MAC design, which is independent of underlying PHY technologies, is provided. The text also briefly reviews standardization with IEEE802.15.6, IEEE 11073, and ETSI eHealth Project. This book is a useful tool for university students, communication system engineers, and communication system researchers who study or design WBAN.

*Wireless Body Area Network* River Publishers
Issues in Electronics Research and Application: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Radar and Sonar Research. The editors have built Issues in Electronics Research and Application: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Radar and Sonar Research in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Electronics Research and Application: 2013 Edition has been produced by the world ’ s leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

*Proceedings of MISS 2020* IGI Global
This book is a printed edition of the Special Issue "QoS in Wireless Sensor/Actuator Networks and Systems" that was published in JSAN

**Principles, Technologies and Control** IGI Global
This book investigates the possible circuit solutions to overcome the temperature and supply voltage-sensitivity of fully-integrated time references for ultra-low-power communication in wireless sensor networks. The authors provide an elaborate theoretical introduction and literature study to enable full understanding of the design challenges and shortcomings of current oscillator implementations. Furthermore, a closer look to the short-term as well as the long-term frequency stability of integrated oscillators is taken. Next, a design strategy is developed and applied to 5 different oscillator topologies and 1 sensor interface. All 6 implementations are subject to an elaborate study of frequency stability, phase noise and power consumption. In the final chapter all blocks are compared to the state of the art.

Temperature- and Supply Voltage-Independent Time References for Wireless Sensor Networks River Publishers
Wireless Personal Area Networks provides an in-depth analysis of the recent IEEE 802.15.4 standard for low data rate wireless personal area networks (LR-WPANs), including suggestions to improve performance and comparisons with the related 802.15.1 (Bluetooth) standard. It assesses the suitability of the standard for the development and deployment of wireless sensor networks as well as providing guidance and insight into the relative advantages and disadvantages of various performance solutions. Wireless Personal Area Networks: Provides a comprehensive, in-depth look at the issues surrounding WPAN network operation and performance. Investigates multi-cluster networks and compares how they can be implemented. Analyzes the performance of a single cluster under different traffic and power management regimes including uplink vs. downlink traffic, acknowledged vs. unacknowledged traffic, saturation vs. non-saturation, and the like. Discusses security issues in WPANs such as different security threats, their impact on performance, standard security mechanisms, and security policies. Compares the IEEE 802.15.4 standard with the related Bluetooth IEEE 802.15.1 standard in terms of suitability for implementing wireless sensor networks. This reference is a valuable tool for developers and researchers getting acquainted with various aspects of IEEE 802.15.4 technology. Graduate students studying courses such as Performance Evaluation, Wireless Sensor Networks and Queuing Theory will also find this book very insightful.

Ambient Assisted Living and Enhanced Living Environments John Wiley & Sons
"If we had computers that knew everything there was to knowabout things—using data they gathered without any help fromus—we would be able to track and count everything, and greatlyreduce waste, loss, and cost. We would know when things neededreplacing, repairing or recalling, and whether they were fresh orpast their best. The Internet of Things has the potential to changethe world, just as the Internet did. Maybe even more so." —Kevin Ashton, originator of the term, Internet of Things An examination of the concept and unimagined potentialunleashed by the Internet of Things (IoT) with IPv6 andMIPv6 What is the Internet of Things? How can it help my organization?What is the cost of deploying such a system? What are the securityimplications? Building the Internet of Things with IPv6 andMIPv6: The Evolving World of M2M Communications answers thesequestions and many more. This essential book explains the concept and potential that theIoT presents, from mobile applications that allow home appliancesto be programmed remotely, to solutions in manufacturing and energyconservation. It features a tutorial for implementing the IoT usingIPv6 and Mobile IPv6 and offers complete chapter coverage thatexplains: What is the Internet of Things? Internet of Things definitions and frameworks Internet of Things application examples Fundamental IoT mechanisms and key technologies Evolving IoT standards Layer 1/2 connectivity: wireless technologies for the IoT Layer 3 connectivity: IPv6 technologies for the IoT IPv6 over low power WPAN (6lowpan) Easily accessible, applicable, and not overly technical,Building the Internet of Things with IPv6 and MIPv6 is animportant resource for Internet and ISP providers,telecommunications companies, wireless providers, logisticsprofessionals, and engineers in equipment development, as well asgraduate students in computer science and computer engineeringcourses.

*The Holy Grail of Holistic Communication and Immersive Experience* CRC Press
Telemedicine Technologies: Big Data, Deep Learning, Robotics, Mobile and Remote Applications for Global Healthcare illustrates the innovative concepts, methodologies and frameworks that will increase the feasibility of the existing telemedicine system. The book also focuses on showcasing prototypes of remote healthcare systems, thus emphasizing the data processing side that is often recognized as the backbone of any telemedicine system. Illustrates the innovative concepts, methodologies and frameworks that will increase the feasibility of the existing telemedicine system Focuses on showcasing prototypes of remote healthcare systems

Advances in Data and Information Sciences River Publishers
This book approaches the topic area of the Internet of Things (IoT) from the perspective of the five types of human communication. Through this perspective on the human communication types, the book aims to specifically address how IoT technologies can support humans and their endeavors. The book explores the fields of sensors, wireless, physiology, biology, wearables, and the Internet. This book is organized with five sections, each covering a central theme; Section 1: The basics of human bond communication Section 2: Relevance IoT, BAN and PAN Section 3: Applications of HBC Section 4: Security, Privacy and Regulatory Challenges Section 5: The Big Picture (Where do we go from here?)

Cyber Law, Privacy, and Security: Concepts, Methodologies, Tools, and Applications Butterworth-Heinemann
The LNCS journal Transactions on Computational Science reflects

recent developments in the field of Computational Science, conceiving the field not as a mere ancillary science but rather as an innovative approach supporting many other scientific disciplines. The journal focuses on original high-quality research in the realm of computational science in parallel and distributed environments, encompassing the facilitating theoretical foundations and the applications of large-scale computations and massive data processing. It addresses researchers and practitioners in areas ranging from aerospace to biochemistry, from electronics to geosciences, from mathematics to software architecture, presenting verifiable computational methods, findings, and solutions, and enabling industrial users to apply techniques of leading-edge, large-scale, high performance computational methods. This, the 33rd issue of the Transactions on Computational Science, focusses on computational geometry and computability, with applications in IoT (Internet of Things), Bioinformatics, and WBAN (Wireless Body Area Networks). Three of the seven papers constitute extended versions of papers presented at the 18th International Workshop on Computational Geometry and Security Applications, CGSA 2017, held in Trieste, Italy, in June 2017.

*Handbook of Research on Advanced Wireless Sensor Network Applications, Protocols, and Architectures* MDPI

The implementation of wireless sensor networks has wide-ranging applications for monitoring various physical and environmental settings. However, certain limitations with these technologies must be addressed in order to effectively utilize them. The Handbook of Research on Advanced Wireless Sensor Network Applications, Protocols, and Architectures is a pivotal reference source for the latest research on recent innovations and developments in the field of wireless sensors. Examining the advantages and challenges presented by the application of these networks in various areas, this book is ideally designed for academics, researchers, students, and IT developers.

Wireless Sensor Networks for Developing Countries IGI Global

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.

Network-integrated Sensing and Energy-aware Protocols in Wireless Body Area Networks John Wiley & Sons

The two volumes LNCS 9597 and 9598 constitute the refereed conference proceedings of the 19th European Conference on the Applications of Evolutionary Computation, EvoApplications 2016, held in Porto, Portugal, in March/April 2016, co-located with the Evo* 2016 events EuroGP, EvoCOP, and EvoMUSART. The 57 revised full papers presented together with 17 poster papers were carefully reviewed and selected from 115 submissions. EvoApplications 2016 consisted of the following 13 tracks: EvoBAFIN (natural computing methods in business analytics and finance), EvoBIO (evolutionary computation, machine learning and data mining in computational biology), EvoCOMNET (nature-inspired techniques for telecommunication networks and other parallel and distributed systems), EvoCOMPLEX (evolutionary algorithms and complex systems), EvoENERGY (evolutionary computation in energy applications), EvoGAMES (bio-inspired algorithms in games), EvoIASP (evolutionary computation in image analysis, signal processing, and pattern recognition), EvoINDUSTRY (nature-inspired techniques in industrial settings), EvoNUM (bio-inspired algorithms for continuous parameter optimization), EvoPAR (parallel implementation of evolutionary algorithms), EvoRISK (computational intelligence for risk management, security and defence applications), EvoROBOT (evolutionary robotics), and EvoSTOC (evolutionary algorithms in stochastic and dynamic environments).

John Wiley & Sons

Edited by a panel of experts, this book fills a gap in the existing literature by comprehensively covering system, processing, and application aspects of biometrics, based on a wide variety of biometric traits. The book provides an extensive survey of biometrics theory, methods,and applications, making it an indispensable source of information for researchers, security experts, policy makers, engineers, practitioners, and graduate students. The book's wide and in-depth coverage of biometrics enables readers to build a strong, fundamental understanding of theory and methods, and provides a foundation for solutions to many of today ' s most interesting and challenging biometric problems. Biometric traits covered: Face, Fingerprint, Iris, Gait, Hand Geometry, Signature, Electrocardiogram (ECG), Electroencephalogram (EEG), physiological biometrics. Theory, Methods and Applications covered: Multilinear Discriminant Analysis, Neural Networks for biometrics, classifier design, biometric fusion, Event-Related Potentials, person-specific characteristic feature selection, image and video-based face, recognition/verification, near-infrared face recognition, elastic graph matching, super-resolution of facial images, multimodal solutions, 3D approaches to biometrics, facial aging models for recognition, information theory approaches to biometrics, biologically-inspired methods, biometric encryption, decision-making support in biometric systems, privacy in biometrics.

**Performance, Interconnection and Security with IEEE 802.15.4** Springer Nature

Wireless Body Area Network

*Transactions on Computational Science XXXIII* Springer

Estimation of unknown parameters is considered as one of the major research areas in statistical signal processing. In the most recent decades, approaches in estimation theory have become more and more attractive in practical applications. Examples of such applications may include, but are not limited to, positioning using various measurable radio signals in indoor environments, self-navigation for autonomous cars, image processing, radar tracking and so on. One issue that is usually encountered when solving an estimation problem is to identify a good system model, which may have great impacts on the estimation performance. In this thesis, we are interested in studying estimation problems particularly in inferring the unknown positions from noisy radio signal measurements. In addition, the modeling of the system is studied by investigating the relationship between positions and radio signal strength measurements. One of the main contributions of this thesis is to propose a novel indoor positioning framework based on proximity measurements, which are obtained by quantizing the received signal strength measurements. Sequential Monte Carlo methods, to be more specific particle filter and smoother, are utilized for estimating unknown positions from proximity measurements. The Cram é r-Rao bounds for proximity-based positioning are further derived as a benchmark for the positioning accuracy in this framework. Secondly, to improve the estimation performance, Bayesian non-parametric modeling, namely Gaussian processes, have been adopted to provide more accurate and flexible models for both dynamic motions and radio signal strength measurements. Then, the Cram é r-Rao bounds for Gaussian process based system models are derived and evaluated in an indoor positioning scenario. In addition, we estimate the positions of stationary devices by comparing the individual signal strength measurements with a pre-constructed fingerprinting database. The positioning accuracy is further compared to the case where a moving device is positioned using a time series of radio signal strength measurements. Moreover, Gaussian processes have been applied to sports analytics, where trajectory modeling for athletes is studied. The proposed framework can be further utilized to carry out, for instance, performance prediction and analysis, health condition monitoring, etc. Finally, a grey-box modeling is proposed to analyze the forces, particularly in cross-country skiing races, by combining a deterministic kinetic model with Gaussian process.