

Internet Of Things Wireless Sensor Networks

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Wireless Sensor Networks and the Internet of ThingsFuture Directions and ApplicationsApple Academic Press Incorporated
From IoT to AIoT CRC Press

Wireless Sensor Networks and the Internet of Things: Future Directions and Applications explores a wide range of important and real-time issues and applications in this ever-advancing field. Different types of WSN and IoT technologies are discussed in order to provide a strong framework of reference, and the volume places an emphasis on solutions to the challenges of protection, conservation, evaluation, and implementation of WSN and IoT that lead to low-cost products, energy savings, low carbon usage, higher quality, and global competitiveness. The volume is divided into four sections that cover: Wireless sensor networks and their relevant applications Smart monitoring and control systems with the Internet of Things Attacks, threats, vulnerabilities, and defensive measures for smart systems Research challenges and opportunities This collection of chapters on an important and diverse range of issues presents case studies and applications of cutting-edge technologies of WSN and IoT that will be valuable for academic communities in computer science, information technology, and electronics, including cyber security, monitoring, and data collection. The informative material presented here can be applied to many sectors, including agriculture, energy and power, resource management, biomedical and health care, business management, and others.

Middleware Solutions for the Internet of Things Wireless Sensor Networks and the Internet of ThingsFuture Directions and Applications

Wireless Sensor Networks presents the latest practical solutions to the design issues presented in wireless-sensor-network-based systems. Novel features of the text, distributed throughout, include workable solutions, demonstration systems and case studies of the design and application of wireless sensor networks (WSNs) based on the first-hand research and development experience of the author, and the chapters on real applications: building fire safety protection; smart home automation; and logistics resource management. Case studies and applications illustrate the practical perspectives of: · sensor node design; · embedded software design; · routing algorithms; · sink node positioning; · co-existence with other wireless systems; · data fusion; · security; · indoor location tracking; · integrating with radio-frequency identification; and · Internet of things Wireless Sensor Networks brings together multiple strands of research in the design of WSNs, mainly from software engineering, electronic engineering, and wireless communication perspectives, into an over-arching examination of the subject, benefiting students, field engineers, system developers and IT professionals. The contents have been well used as the teaching material of a

course taught at postgraduate level in several universities making it suitable as an advanced text book and a reference book for final-year undergraduate and postgraduate students. *Smart Wireless Sensing* Springer Science & Business Media Internet of Things (IoT) enabled technology is evolving healthcare from conventional hub-based systems to more personalized eHealth systems, enabling faster and safer preventive care, lower overall cost, improved patient-centric practice and enhanced sustainability. Efficient IoT-enabled eHealth systems can be realized by providing highly customized access to rich medical information and efficient clinical decisions to each individual with unobtrusive monitoring. Wireless medical sensor networks (WMSNs) are at the heart of this concept, and their development is a key issue if such a concept is to achieve its potential.

Wireless Sensor Networks and the Internet of Things Springer

The energy efficiency paradigm is a major bottleneck for the development of wireless sensor networks (WSNs) and Internet of Things (IoT) architectures and technologies. This edited book presents comprehensive coverage of energy harvesting sources and techniques that can be used for WSN and IoT systems.

Internet of Things and Access Control IET

This book presents the design and development of an access control architecture for the Internet of Things (IoT) systems. It considers the significant authentication and authorization issues for large-scale IoT systems, in particular, the need for access control, identity management, delegation of access rights and the provision of trust within such systems. It introduces a policy-based access control approach for the IoT that provides fine-grained access for authorized users to services while protecting valuable resources from unauthorized access. Further, the book discusses an identity-less, asynchronous and decentralized delegation model for the IoT leveraging the advantage of blockchain technology. It also presents an approach of attribute-based identity and examines the notion of trust in an IoT context by considering the uncertainty that exists in such systems. Fully explaining all the techniques used, the book is of interest to engineers, researchers and scientists working in the field of the wireless sensor networks, IoT systems and their access control management.

Handbook of Research on Advanced Wireless Sensor Network Applications, Protocols, and Architectures Springer Nature

The Internet of Things (IoT) has attracted much attention from society, industry and academia as a promising technology that can enhance day to day activities, and the creation of new business models, products and services, and serve as a broad source of research topics and ideas. A future digital society is envisioned, composed of numerous wireless connected sensors and devices. Driven by huge demand, the massive IoT (mIoT) or massive machine type communication (mMTC) has been identified as one of the three main communication scenarios for 5G. In addition to connectivity, computing and storage and data management are also long-standing issues for low-cost devices

and sensors. The book is a collection of outstanding technical research and industrial papers covering new research results, with a wide range of features within the 5G-and-beyond framework. It provides a range of discussions of the major research challenges and achievements within this topic.

INTERNET of THINGS and WIRELESS SENSOR NETWORK John Wiley & Sons

The Internet has gone from an Internet of people to an Internet of Things (IoT). This has brought forth strong levels of complexity in handling interoperability that involves the integrating of wireless sensor networks (WSNs) into IoT. This book offers insights into the evolution, usage, challenges, and proposed countermeasures associated with the integration. Focusing on the integration of WSNs into IoT and shedding further light on the subtleties of such integration, this book aims to highlight the encountered problems and provide suitable solutions. It throws light on the various types of threats that can attack both WSNs and IoT along with the recent approaches to counter them. This book is designed to be the first choice of reference at research and development centers, academic institutions, university libraries, and any institution interested in the integration of WSNs into IoT.

Undergraduate and postgraduate students, Ph.D. scholars, industry technologists, young entrepreneurs, and researchers working in the field of security and privacy in IoT are the primary audience of this book.

IGI Global

"This book examines digital image processing in the internet of things and addresses the challenges of transmitting image data over the bandwidth constraints of wireless sensor networks"--

Wireless Medical Sensor Networks for IoT-based eHealth John Wiley & Sons

LEARN MORE ABOUT FOUNDATIONAL AND ADVANCED TOPICS IN INTERNET OF THINGS TECHNOLOGY WITH THIS ALL-IN-ONE GUIDE *Enabling the Internet of Things: Fundamentals, Design, and Applications* delivers a comprehensive starting point for anyone hoping to understand the fundamentals and design of Internet of Things (IoT) systems. The book's distinguished academics and authors offer readers an opportunity to understand IoT concepts via programming in an abstract way. Readers will learn about IoT fundamentals, hardware and software components, IoT protocol stacks, security, IoT applications and implementations, as well as the challenges, and potential solutions, that lie ahead. Readers will learn about the social aspects of IoT systems, as well as receive an introduction to the Blockly Programming Language, IoT Microcontrollers, IoT Microprocessors, systems on a chip and IoT Gateway Architecture. The book also provides implementation of simple code examples in Packet Tracer, increasing the usefulness and practicality of the book. *Enabling the Internet of Things* examines a wide variety of other essential topics, including: The fundamentals of IoT, including its evolution, distinctions, definitions, vision, enabling technologies, and building blocks An elaboration of the sensing principles of IoT and the essentials of wireless sensor networks A detailed examination of the IoT protocol stack for communications An analysis of the security challenges and threats faced by users of IoT devices, as well as the countermeasures that can be used to fight them, from the perception layer to the application layer Perfect as a supplementary text for undergraduate students taking computer science or electrical engineering courses, *Enabling the Internet of Things* also belongs on the bookshelves of industry professionals and researchers who regularly work with and on the Internet of Things and who seek a better understanding of its foundational and advanced topics.

Wireless Sensor Networks and the Internet of Things John Wiley & Sons

The current world of technology faces massive advancements that influence different sectors such as transport, health care system, and education, amongst others. The telecommunication and information industry has become significant over time and has experienced considerable development. This trend is likely to extend into the future, both in terms of hardware and software. The industry plans to make modern advancements in the next five years to change their current modes of operation. Some of the significant changes that are forecast for the industry include technological advances such as 5G, Artificial Intelligence (AI), Machine Learning (ML), IoT, wireless sensor networks, and cross-industry alliances. 5G mobile connectivity is expected to bring advanced technical improvements helping employment as well as growth in GDP. In the fusion of these technologies, the potential of IoT and Wireless Sensor Networks (WSN) would be witnessed through various applications such as connected consumer, home monitoring system, predictive maintenance, factory monitoring, and so on. A Wireless Sensor Network (WSN) is a term used for a network of devices that can gather information and then communicate it through any wireless link. The data collected is then transferred using different nodes and multiple gateways. With the evolution of technology, some new criteria have been introduced to check and balance the environmental conditions for reliable and fast response operations for a quick response and service under different scenarios and situations. There has been an increased use of smart wireless sensor objects in the current world by various organizations. The growth of the Internet of Things (IoT), industrial IoT, and wireless sensor networks have shaped different technologies and enables faster, reliable, and sufficient production of goods and services. Although there are limitations and challenges such as storage capacity, processing power, communication range, and battery life, WSN significantly affects IoT technology development. Learning about the standards and specifications of WSNs is vital to understanding their general functionality and how they are in close interaction with the Internet of Things, with many massive billions of device connectivity. Future developments should focus on building a self-adaptive spectrum management middleware for the wireless sensor networks. The telecom industry will continue to face regulatory challenges it faces currently. Various new regulations are likely to come up soon, and these will also have financial implications for the companies. The need to ensure consumer privacy is a critical issue that will be of prime concern to the telecoms in the next few years. Various aspects, such as the standards and the architectures, need to be considered to ensure the security and operational consistency of these wireless sensor networks; therefore, industry players should keep up with the changing trends and adapt accordingly. In this book there are twelve chapters which cover wireless networking sensors evolution and technologies advancement. We are very pleased that the technology, academic, and industry communities are discussing this important and fast growing industry and we are certain that the content of this book will shed some light on this subject. The chapters presented in this book discuss technologies, design, implementation and applications of various short and long range wireless sensors networking. The challenges and issues faced in providing applications and services to meet user experiences ubiquitously and securely are presented. *Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems* IGI Global 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.

Fundamentals, Design and Applications World Scientific

CLOUD AND IOT-BASED VEHICULAR AD HOC NETWORKS This book details the architecture behind smart cars being fitted and connected with vehicular cloud computing, IoT and VANET as part of the intelligent transport system (ITS). As technology continues to weave itself more tightly into everyday life, socioeconomic development has become intricately tied to ever-evolving innovations. An example of this is the technology being developed to address the massive increase in the number of vehicles on the road, which has resulted in more traffic congestion and road accidents. This challenge is being addressed by developing new technologies to optimize traffic management operations. This book describes the state-of-the-art of the recent developments of Internet of Things (IoT) and cloud computing-based concepts that have been introduced to improve Vehicular Ad-Hoc Networks (VANET) with advanced cellular networks such as 5G networks and vehicular cloud concepts. 5G cellular networks provide consistent, faster and more reliable connections within the vehicular mobile nodes. By 2030, 5G networks will deliver the virtual reality content in VANET which will support vehicle navigation with real time communications capabilities, improving road safety and enhanced passenger comfort. In particular, the reader will learn: A range of new concepts in VANETs, integration with cloud computing and IoT, emerging wireless networking and computing models New VANET architecture, technology gap, business opportunities, future applications, worldwide applicability, challenges and drawbacks Details of the significance of 5G Networks in VANET, vehicular cloud computing, edge (fog) computing based on VANET.

Audience The book will be widely used by researchers, automotive industry engineers, technology developers, system architects, IT specialists, policymakers and students.

Internet of Things and Data Analytics Handbook Institution of Engineering and Technology

This book focuses on RFID (Radio Frequency Identification), IoT (Internet of Things), and WSN (Wireless Sensor Network). It includes contributions that discuss the security and privacy issues as well as the opportunities and applications that are tightly linked to sensitive infrastructures and strategic services. This book addresses the complete functional framework and workflow in IoT-enabled RFID systems and explores basic and high-level concepts. It is based on the latest technologies and covers the major challenges, issues, and advances in the field. It presents data acquisition and case studies related to data-intensive technologies in RFID-based IoT and includes WSN-based systems and their security. It can serve as a manual for those in the industry while also helping beginners to understand both the basic and advanced aspects of IoT-based RFID-related issues. This book can be a premier interdisciplinary platform for researchers, practitioners, and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered, and find solutions that have been adopted in the fields of IoT and analytics.

Wireless sensor networks protocols in IoT. A performance evaluation and comparison John Wiley & Sons

The Internet has gone from an Internet of people to an Internet of Things (IoT). This has brought forth strong levels of complexity in handling interoperability that involves the integrating of wireless sensor networks (WSNs) into IoT. This book offers insights into

the evolution, usage, challenges, and proposed countermeasures associated with the integration. Focusing on the integration of WSNs into IoT and shedding further light on the subtleties of such integration, this book aims to highlight the encountered problems and provide suitable solutions. It throws light on the various types of threats that can attack both WSNs and IoT along with the recent approaches to counter them. This book is designed to be the first choice of reference at research and development centers, academic institutions, university libraries, and any institution interested in the integration of WSNs into IoT. Undergraduate and postgraduate students, Ph.D. scholars, industry technologists, young entrepreneurs, and researchers working in the field of security and privacy in IoT are the primary audience of this book.

Technologies and Applications Springer Nature

This book is a printed edition of the Special Issue "Wireless Sensor and Actuator Networks for Smart Cities" that was published in JSAN

Recent Advances and Challenges Springer

This book includes high-quality research papers presented at the 1st International Conference on Wireless Sensor Networks, Ubiquitous Computing and Applications (ICWSNUCA, 2021), which is held at Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, India, during 26–27 February, 2021. This volume focuses on the applications, use-cases, architectures, deployments, and recent advances of wireless sensor networks as well as ubiquitous computing. Different research topics are illustrated in this book, like wireless sensor networks for the Internet of Things; IoT applications for eHealth; smart cities; architectures for WSNs and IoT, WSNs hardware and new devices; low-power wireless technologies; wireless ad hoc sensor networks; routing and data transfer in WSNs; multicast communication in WSNs; security management in WSNs and in IoT systems; and power consumption optimization in WSNs.

Principles, Design and Applications CRC Press

This book provides essential future directions for IoT and Big Data research. Thanks to rapid advances in sensors and wireless technology, Internet of Things (IoT)-related applications are attracting more and more attention. As more devices are connected, they become potential components for smart applications. Thus, there is a new global interest in these applications in various domains such as health, agriculture, energy, security and retail. The main objective of this book is to reflect the multifaceted nature of IoT and Big Data in a single source. Accordingly, each chapter addresses a specific domain that is now being significantly impacted by the spread of soft computing

AI, IoT, and 5G Information Science Reference

Perception of human beings has evolved from natural biosensor to powerful sensors and sensor networks. In sensor networks, trillions of devices are interconnected and sense a broad spectrum of contexts for human beings, laying the foundation of Internet of Things (IoT). However, sensor technologies have several limitations relating to deployment cost and usability, which render them unacceptable for practical use. Consequently, the pursuit of convenience in human perception necessitates a wireless, sensorless and contactless sensing paradigm. Recent decades have witnessed rapid developments in wireless sensing technologies, in which sensors detect wireless signals (such as acoustic, light, and radio frequency) originally designed for data transmission or lighting. By analyzing the signal measurements on the receiver end, channel characteristics can be obtained to convey the sensing results. Currently, significant effort is being devoted to employing the ambient Wi-Fi, RFID, Bluetooth, ZigBee, and television signals for smart wireless sensing, eliminating the

need for dedicated sensors and promoting the prospect of the Artificial Intelligence of Things (AIoT). This book provides a comprehensive and in-depth discussion of wireless sensing technologies. Specifically, with a particular focus on Wi-Fi-based sensing for understanding human behavior, it adopts a top-down approach to introduce three key topics: human detection, localization, and activity recognition. Presenting the latest advances in smart wireless sensing based on an extensive review of state-of-the-art research, it promotes the further development of this area and also contributes to interdisciplinary research. *Wireless Sensor and Actuator Networks for Smart Cities* CRC Press

The emerging internet of things (IoT) is all about connecting machines and systems together through sensors and actuators. The meaningful information collected from the sensors can be processed timely and possible actions can be taken either by the actuator or human to enhance productivity, efficiency, and reliability. We will see IoT devices and embedded systems become more and more prevalent in our daily lives. One such area is the power generation industry. Not surprisingly, the power generation industry has been one of the early adopters of IoT. The expensive electricity generator is embedded with massive internet-connected sensors for its operation condition monitor to prevent potential catastrophic failure. This dissertation presents the development of a low-cost, easy-to-deploy, self-powered

wireless sensor nodes and integrates them with existing solutions into wireless sensor networks to monitor temperature and vibration information of the instruments in a power plant (e.g., motor, pump, etc.). Each sensor node includes: (a) energy harvesting components (which convert the vibrational motion of the instruments into electricity) made by a piezoelectric material; (b) a power management application-specific integrated circuit (ASIC) for AC to DC, DC to DC and voltage regulation; (c) the multi-physical sensor components, including temperature and vibration sensors; (d) an ultralow-power wireless communication unit using ZigBee protocol. We design a customer-specific printed circuit board (PCB) to integrate the sensor node components and a robust package to protect the sensor node for field deployment and harsh environment applications. The sensors communicate with a powered gateway unit intermittently while constantly harvesting and storing energy, maintaining always-on operation without external energy input. Attribute reporting allows the system to transmit data in a more intelligent and energy-efficient way. These sensor nodes can be installed by the end-users (requiring no professional training) in a non-intrusive way by retrofitting or mounting onto an equipment's surface using strong magnetic tape. The proposed wireless sensors can be implemented in any industrial power plant and require minimal maintenance while providing continuous, long-term monitoring of equipment with the real-time readout of temperature and vibration, and possibly other parameters of interest.