internet of things wireless sensor networks

#Internet of Things #Wireless Sensor Networks #IoT Sensor Technology #Connected Devices #Real-time Data Monitoring

Explore how Internet of Things (IoT) converges with Wireless Sensor Networks (WSN) to create intelligent, interconnected environments. These IoT sensor networks leverage connected devices for efficient real-time data monitoring, enabling a myriad of smart applications from industrial automation to environmental sensing.

Wireless Sensor Networks

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.

INTERNET of THINGS and WIRELESS SENSOR NETWORK

This book is ideal for networking designers and engineers who want to fully exploit the IoT with Sensor Network who are concerned about design, integrate and implement the IoT with Sensor Network. It helps reader to discover the emerging field of low-cost standards-based sensors that promise a high order of spatial and temporal resolution and accuracy in an ever-increasing universe of applications. This book is a broad introduction of all the major technology, standards, protocol and application topics related to IoT and WSN. The state-of-the-art protocol for WSN protocol stack is explored for transport, routing, data link and physical layers. Moreover, the open research issues are discussed for each of the

protocol layers. Furthermore, the synchronization and localization problems in WSNs are investigated along with the existing solutions and open research issues. Finally, the existing evaluation approaches for WSNs including physical testbeds and software simulation environments are overviewed. It contains everything readers need to know to enter in this emerging field, including architecture, protocol, communication, design, integration, and implementation for IoT and Wireless Sensor Networks. It is appropriate for use as a coursebook for higher-level undergraduates and postgraduate students.

Wireless Sensor Networks and the Internet of Things

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.

Internet of Things

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.

Energy Harvesting in Wireless Sensor Networks and Internet of Things

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 Medical Sensor Networks for IoT-based eHealth

"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 Sensor Network-based Approaches to Digital Image Processing in the IoT

The book covers a variety of topics in Information and Communications Technology (ICT) and their impact on innovation and business. The authors discuss various innovations, business and industrial motivations, and impact on humans and the interplay between those factors in terms of finance, demand, and competition. Topics discussed include the convergence of Machine to Machine (M2M), Internet of Things (IoT), Social, and Big Data. They also discuss AI and its integration into technologies from machine learning, predictive analytics, security software, to intelligent agents, and many more. Contributions come from academics and professionals around the world. Covers the most recent practices in ICT related topics pertaining to technological growth, innovation, and business; Presents a survey on the most recent technological areas revolutionizing how humans communicate and interact; Features four sections: IoT, Wireless Ad Hoc & Sensor Networks, Fog Computing, and Big Data Analytics.

Recent Trends and Advances in Wireless and IoT-enabled Networks

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 Sensors Networks in 5G Wireless Communications

This book exploits the benefits of integration of wireless sensor networks (WSN) and Internet of Things (IoT) for smart cities. The authors discuss WSN and IoT in tackling complex computing tasks and challenges in the fields of disaster relief, security, and weather forecasting (among many others). This book highlights the challenges in the field of quality of service metrics (QoS) in the WSN based IoT applications. Topics include IoT Applications for eHealth, smart environments, intelligent transportation systems, delay tolerant models for IoT applications, protocols and architectures for industrial IoT, energy efficient protocols, and much more. Readers will get to know the solutions of these problems for development of smart city applications with the integration of WSN with IoT.

Integration of WSN and IoT for Smart Cities

Advancement in sensor technology, smart instrumentation, wireless sensor networks, miniaturization, RFID and information processing is helping towards the realization of Internet of Things (IoT). IoTs are finding applications in various area applications including environmental monitoring, intelligent buildings, smart grids and so on. This book provides design challenges of IoT, theory, various protocols, implementation issues and a few case study. The book will be very useful for postgraduate students and researchers to know from basics to implementation of IoT.

Internet of Things

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.

Wireless Sensor Networks (WSN)

Master's Thesis from the year 2018 in the subject Engineering - Computer Engineering, grade: 3.71, Cyprus International University, language: English, abstract: In this thesis, three Wireless Sensor Networks – Ad-hoc On-Demand Distance Vector, Dynamic Source routing protocol and Optimized Link State routing protocol have been simulated and compared in typical IoT scenarios. Their performance was evaluated using three performance metrics and then they were compared; the performance metrics are Routing Overhead, Average End to End Delay and Throughput. Different number of nodes with different percentages of mobile nodes were analyzed. Specifically, number of nodes analyzed were 20, 40, 60 and 70 with the number of mobile nodes 10, 15 and 20 using OPNET while with NS 3 20, 60 and 100 nodes were analyzed. For each of the number of nodes, all the number of mobile nodes were evaluated. The routing protocols were analyzed using the OPNET Simulation Software and NS-3and the environment size for the simulation was 1000m by 1000m. IoT has continue to grow bigger since from its inception. Many mobile devices are now available, the internet and its application have only grown bigger and better. As IoT is continually growing, so also is the complexity, as a result issues pertaining routing have also increased. Many researches have been made in attempt to proffer solutions that will either minimize or eliminate these routing issues. Different routing protocols have been designed with different specifications for different applications of the IoT. Also, attempts have been made to implement routing protocols of other types of networks in the IoT.

Wireless sensor networks protocols in IoT. A performance evaluation and comparison

This book presents methods for advancing green IoT sensor networks and IoT devices. Three main methods presented are: a standalone system to support IoT devices that is informed by the amount of energy the solar array system can produce; a model of securing a building's main power supply against unauthorized use; and security of the IoT devices and their networks. For each, the authors outline the methods, presents security and privacy issues, and their solutions. The work suggests a layered approach to expose security issues and challenges at each layer of the IoT architecture and proposes techniques used to mitigate these challenges. Finally, perspectives are drawn and discussed for future directions in securing IoT sensor networks, covering evolving areas such as artificial intelligence, blockchain technology, sensor Internet of People, context-aware sensing, cloud infrastructure, security and privacy, and the Internet of Everything.

Green Internet of Things Sensor Networks

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.

Integration of WSNs into Internet of Things

Wireless Sensor Networks is an essential guide for anyone interested in wireless communications for sensor networks, home networking, or device hacking. It covers a large number of topics encountered in the architecture, application, and recent advancements of a wireless sensor network, including hardware and software architectures, the Internet of Things, routing and security, MANETs, MEMS, Zigbee, TDMA, securing networks for WiFi, ubiquitous sensor networks, underwater, mobile, and multimedia wireless networks. Features: • Includes a wide range of applications to industry, science, transportation, civil infrastructure, and security • Covers the Internet of Things (IoT), MEMS, Zigbee, TDMA, mobile wireless networks, and more • Features article on securing networks for WiFi by the United States Department of Homeland Security (DHS) Cybersecurity Engineering

Wireless Sensor Networks

This book presents Wireless sensor networks (WSNs) refer to networks of spatially dispersed and dedicated sensors that monitor and record the physical conditions of the environment and forward the collected data to a central location. WSNs can measure environmental conditions such as temperature, sound, pollution levels, humidity and wind.It is an outcome of expensive research carried over many years towards addressing energy problems in wireless sensor network. With the increasing inclination towards adoption of wireless sensor network, the research community consistently struggles for overcoming energy problems within the sensor node. After reviewing enough research articles, I found that problems towards energy-efficient routing is still unsolved and no robust or benchmarked technique or algorithm exists that can take this claim. I have studied this problem and developed a very novel framework for ensuring enhanced network lifetime in sensor network.

Wireless Sensor Network and IoT

After a brief introduction and contextualization on the Internet of Things (IoT) and Web of Things (WoT) paradigms, this timely new book describes one of the first research initiatives aimed at tackling the several challenges involved in building a middleware-layer infrastructure capable of realizing the WoT vision: the SmartSensor infrastructure. It is based on current standardization efforts and designed to manage a specific type of physical devices, those organized to shape a Wireless Sensor Network (WSN), where sensors work collaboratively, extracting data and transmitting it to external networks to be further analysed and processed. Middleware Solutions for the Internet of Things describes this infrastructure and its RESTful-based programming model that allows developers create applications without having specific knowledge about physical devices or networking environments. It is also shown, step by step, how to create a Web Mashup application using SmartSensor.

Middleware Solutions for the Internet of Things

Wireless sensor networks have become an intricate and necessary addition to daily life by providing an energy efficient way to collect and monitor data while rerouting the information to a centralized location. As the application of these networks becomes more common, it becomes imperative to evaluate their effectiveness, as well as other opportunities for possible implementation in the future. The Handbook of Research on Wireless Sensor Network Trends, Technologies, and Applications provides inclusive coverage on the processing and applications of wireless communication, sensor networks, and mobile computing. Investigating emergent research and theoretical concepts in the area of wireless sensors and their applications to daily life, this handbook of research is a critical reference source for students, researchers, engineers, scientists, and working professionals.

Handbook of Research on Wireless Sensor Network Trends, Technologies, and Applications

The following topics are dealt with: Internet of Things; wireless sensor networks; data analysis; logistics; sea ports; production engineering computing; signalling protocols; radio networks; local area networks; telecommunication congestion control.

Sensors in the Age of the Internet of Things

Internet of Things: Connecting Objects puts forward the technologies and the networking architectures which make it possible to support the Internet of Things. Amongst these technologies, RFID, sensor and PLC technologies are described and a clear view on how they enable the Internet of Things is given. This book also provides a good overview of the main issues facing the Internet of Things such as the issues of privacy and security, application and usage, and standardization.

The Internet of Things

This book discusses and addresses the issues and challenges of wireless sensor networks (WSNs). It presents various problems and offers workable solutions for both academics and researchers. It includes three sections and five chapters that discuss different WSN models, the Internet of Things (IoT) and health monitoring, industrial IoT, wireless body area networks, energy management in WSNs, and more.

Emerging Trends in Wireless Sensor Networks

This informative text/reference presents a detailed review of the state of the art in industrial sensor and control networks. The book examines a broad range of applications, along with their design objectives and technical challenges. The coverage includes fieldbus technologies, wireless communication technologies, network architectures, and resource management and optimization for industrial networks. Discussions are also provided on industrial communication standards for both wired and wireless technologies, as well as for the Industrial Internet of Things (IIoT). Topics and features: describes the FlexRay, CAN, and Modbus fieldbus protocols for industrial control networks, as well as the MIL-STD-1553 standard; proposes a dual fieldbus approach, incorporating both CAN and ModBus fieldbus technologies, for a ship engine distributed control system; reviews a range of industrial wireless sensor network (IWSN) applications, from environmental sensing and condition monitoring, to process automation; examines the wireless networking performance, design requirements, and technical limitations of IWSN applications; presents a survey of IWSN commercial solutions and service providers, and summarizes the emerging trends in this area; discusses the latest technologies and open challenges in realizing the vision of the IIoT, highlighting various applications of the IIoT in industrial domains; introduces a logistics paradigm for adopting IIoT technology on the Physical Internet. This unique work will be of great value to all researchers involved in industrial sensor and control networks, wireless networking, and the Internet of Things.

Industrial Sensors and Controls in Communication Networks

This book explores various challenging problems and applications areas of wireless sensor networks (WSNs), and identifies the current issues and future research challenges. Discussing the latest developments and advances, it covers all aspects of in WSNs, from architecture to protocols design, and from algorithm development to synchronization issues. As such the book is an essential reference resource for undergraduate and postgraduate students as well as scholars and academics working in the field.

Handbook of Wireless Sensor Networks: Issues and Challenges in Current Scenario's

Security and Privacy Issues in IoT Devices and Sensor Networks investigates security breach issues in IoT and sensor networks, exploring various solutions. The book follows a two-fold approach, first focusing on the fundamentals and theory surrounding sensor networks and IoT security. It then explores practical solutions that can be implemented to develop security for these elements, providing case studies to enhance understanding. Machine learning techniques are covered, as well as other security paradigms, such as cloud security and cryptocurrency technologies. The book highlights how these techniques can be applied to identify attacks and vulnerabilities, preserve privacy, and enhance data security. This in-depth reference is ideal for industry professionals dealing with WSN and IoT systems who want to enhance the security of these systems. Additionally, researchers, material developers and technology specialists dealing with the multifarious aspects of data privacy and security enhancement will benefit from the book's comprehensive information. Provides insights into the latest research trends and theory in the field of sensor networks and IoT security Presents machine learning-based solutions for data security enhancement Discusses the challenges to implement various security techniques Informs on how analytics can be used in security and privacy

Security and Privacy Issues in IoT Devices and Sensor Networks

The Internet of Things (IoT) is the next big challenge for the research community. The IPv6 over low power wireless personal area network (6LoWPAN) protocol stack is considered a key part of the IoT. In 6LoWPAN networks, heavy network traffic causes congestion which significantly degrades network performance and impacts on quality of service aspects. This book presents a concrete, solid and logically ordered work on congestion control for 6LoWPAN networks as a step toward successful implementation of the IoT and supporting the IoT application requirements. The book addresses the congestion control issue in 6LoWPAN networks and presents a comprehensive literature review on con-

gestion control for WSNs and 6LoWPAN networks. An extensive congestion analysis and assessment for 6LoWPAN networks is explored through analytical modelling, simulations and real experiments. A number of congestion control mechanisms and algorithms are proposed to mitigate and solve the congestion problem in 6LoWPAN networks by using and utilizing the non-cooperative game theory, multi-attribute decision making and network utility maximization framework. The proposed algorithms are aware of node priorities and application priorities to support the IoT application requirements and improve network performance in terms of throughput, end-to-end delay, energy consumption, number of lost packets and weighted fairness index.

Congestion Control for 6LoWPAN Wireless Sensor Networks: Toward the Internet of Things

The book aims to provide a broad overview of various topics of Internet of Things from the research, innovation and development priorities to enabling technologies, nanoelectronics, cyber physical systems, architecture, interoperability and industrial applications. It is intended to be a standalone book in a series that covers the Internet of Things activities of the IERC – Internet of Things European Research Cluster from technology to international cooperation and the global state of play.The book builds on the ideas put forward by the European research Cluster on the Internet of Things Strategic Research Agenda and presents global views and state of the art results.

Internet of Things Applications - From Research and Innovation to Market Deployment

The Internet of Things (IoT) is the emerging technology that interconnects smart objects using wireless communications. After having been extensively studied in academic labs, the IoT is now widely applied in the industrial world (e.g. domestic automation, smart metering, and smart cities). Internet of Things and M2M Communications presents the key concepts used in the IoT. In particular, machine to machine (M2M) communications have to be energy efficient so that all the smart objects may operate for years on a single battery. Besides, whilst constructing an efficient global digital world that combines personal/private and external/general data, security and privacy issues also have to be adequately covered.

Internet of Things and M2M Communications

Artificial Intelligence Techniques in IoT Sensor Networks is a technical book which can be read by researchers, academicians, students and professionals interested in artificial intelligence (AI), sensor networks and Internet of Things (IoT). This book is intended to develop a shared understanding of applications of AI techniques in the present and near term. The book maps the technical impacts of AI technologies, applications and their implications on the design of solutions for sensor networks. This text introduces researchers and aspiring academicians to the latest developments and trends in AI applications for sensor networks in a clear and well-organized manner. It is mainly useful for research scholars in sensor networks and AI techniques. In addition, professionals and practitioners working on the design of real-time applications for sensor networks may benefit directly from this book. Moreover, graduate and master’s students of any departments related to AI, IoT and sensor networks can find this book fascinating for developing expert systems or real-time applications. This book is written in a simple and easy language, discussing the fundamentals, which relieves the requirement of having early backgrounds in the field. From this expectation and experience, many libraries will be interested in owning copies of this work.

Artificial Intelligence Techniques in IoT Sensor Networks

This book gives an overview of best effort data and real-time multipath routing protocols in WMSN. It provides results of recent research in design issues affecting the development of strategic multipath routing protocols that support multimedia data traffic in WMSN from an IoT perspective, plus detailed analysis on the appropriate traffic models.

Multimedia-enabled Sensors in IoT

This book focuses on the suitable methods to solve optimization problems in wireless network system utilizing digital sensors like Wireless Sensor Network. This kind of system has been emerging as the cornerstone technology for all new smart devices and its direct application in many fields in life.

Soft Computing in Wireless Sensor Networks

Wireless sensors and sensor networks (WSNs) are nowadays becoming increasingly important due to their decisive advantages. Different trends towards the Internet of Things (IoT), Industry 4.0 and 5G Networks address massive sensing and admit to have wireless sensors delivering measurement data directly to the Web in a reliable and easy manner. These sensors can only be supported, if sufficient energy efficiency and flexible solutions are developed for energy-aware wireless sensor nodes. In the last years, different possibilities for energy harvesting have been investigated showing a high level of maturity. This book gives therefore an overview on fundamentals and techniques for energy harvesting and energy transfer from different points of view. Different techniques and methods for energy transfer, management and energy saving on network level are reported together with selected interesting applications. The book is interesting for researchers, developers and students in the field of sensors, wireless sensors, WSNs, IoT and manifold application fields using related technologies. The book is organized in four major parts. The first part of the book introduces essential fundamentals and methods, while the second part focusses on vibration converters and hybridization. The third part is dedicated to wireless energy transfer, including both RF and inductive energy transfer. Finally, the fourth part of the book treats energy saving and management strategies. The main contents are: Essential fundamentals and methods of wireless sensors Energy harvesting from vibration Hybrid vibration energy converters Electromagnetic transducers Piezoelectric transducers Magneto-electric transducers Non-linear broadband converters Energy transfer via magnetic fields RF energy transfer Energy saving techniques Energy management strategies Energy management on network level Applications in agriculture Applications in structural health monitoring Application in power grids Prof. Dr. Olfa Kanoun is professor for measurement and sensor technology at Chemnitz university of technology. She is specialist in the field of sensors and sensor systems design.

Energy Harvesting for Wireless Sensor Networks

As technology continues to expand and develop, the internet of things (IoT) is playing a progressive role in the infrastructure of electronics. The increasing amount of IoT devices, however, has led to the emergence of significant privacy and security challenges. Security and Privacy Issues in Sensor Networks and IoT is a collection of innovative research on the methods and applications of protection disputes in the internet of things and other computing structures. While highlighting topics that include cyber defense, digital forensics, and intrusion detection, this book is ideally designed for security analysts, IT specialists, software developers, computer engineers, industry professionals, academicians, students, and researchers seeking current research on defense concerns in cyber physical systems.

Security and Privacy Issues in Sensor Networks and IoT

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.

Internet of Things and Access Control

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.

Smart Wireless Sensing

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.

Data Security in Internet of Things Based RFID and WSN Systems Applications

This book gathers high-quality research articles and reviews that reflect the latest advances in the smart network-inspired paradigm and address current issues in IoT applications as well as other emerging areas. Featuring work from both academic and industry researchers, the book provides a concise overview of the current state of the art and highlights some of the most promising and exciting new ideas and techniques. Accordingly, it offers a valuable resource for senior undergraduate and graduate students, researchers, policymakers, and IT professionals and providers working in areas that call for state-of-the-art networks and IoT applications.

Smart Network Inspired Paradigm and Approaches in IoT Applications

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

Wireless Sensor and Actuator Networks for Smart Cities

This book constitutes the proceedings from the 20th Tyrrhenian Workshop on Digital Communications, held September 2009 in Pula, Sardinia, Italy and focused on the "Internet of Things."

The Internet of Things

This book mainly concentrates on protecting data security and privacy when participants communicate with each other in the Internet of Things (IoT). Technically, this book categorizes and introduces a collection of secure and privacy-preserving data communication schemes/protocols in three traditional scenarios of IoT: wireless sensor networks, smart grid and vehicular ad-hoc networks recently. This book presents three advantages which will appeal to readers. Firstly, it broadens reader’s horizon in IoT by touching on three interesting and complementary topics: data aggregation, privacy protection, and key agreement and management. Secondly, various cryptographic schemes/protocols used to protect data confidentiality and integrity is presented. Finally, this book will illustrate how to design practical systems to implement the algorithms in the context of IoT communication. In summary, readers can simply learn and directly apply the new technologies to communicate data in IoT after reading this book.

Secure and Privacy-Preserving Data Communication in Internet of Things