Rechargeable Sensor Networks Technology Theory And Application Introduce Energy Harvesting To Sensor Networks

MARITZA ALISSON

Wireless Sensor Networks CRC Press
"This book focuses on wireless sensor networks and their operation, covering topics including routing, energy efficiency and management"--
Data Management, Analytics and Innovation World Scientific
Security issues in distributed systems and network systems are extremely important. This edited book provides a comprehensive treatment on security issues in these systems, ranging from attacks to all kinds of solutions from prevention to detection approaches. The books includes security studies in a range of systems including peer-to-peer networks, distributed systems, Internet, wireless networks, Internet service, e-commerce, mobile and pervasive computing. Security issues in these systems include attacks, malicious node detection, access control, authentication, intrusion detection, privacy and anonymity, security architectures and protocols, security theory and tools, secrecy and integrity, and trust models. This volume provides an excellent reference for students, faculty, researchers and people in the industry related to these fields.
Security in Distributed and Networking Systems World Scientific
Because they provide practical machine-to-machine communication at a very low cost, the popularity of wireless sensor networks is expected to skyrocket in the next few years, duplicating the recent explosion of wireless LANs. Wireless Sensor Networks: Architectures and Protocols describes how to build these networks, from the layers of the
Distributed Computing and Internet Technology World Scientific Publishing Company Incorporated
Motor monitoring, incipient fault detection, and diagnosis are important and difficult topics in the engineering field. These topics deal with motors ranging from small DC motors used in intensive care units to the huge motors used in nuclear power plants. With proper machine monitoring and fault detection schemes, improved safety and reliability can be achieved for different engineering system operations. The importance of incipient fault detection can be found in the cost saving which can be obtained by detecting potential machine failures before they occur. Non-invasive, inexpensive, and reliable fault detection techniques are often preferred by many engineers. A large number of techniques, such as expert system approaches and vibration analysis, have been developed for motor fault detection purposes. Those techniques have achieved a certain degree of success. However, due to the complexity and importance of the systems, there is a need to further improve existing fault detection techniques.A major key to the success in fault detection is the ability to use appropriate technology to effectively fuse the relevant information to provide accurate and reliable results. The advance in technology will provide opportunities for improving existing fault detection schemes. With the maturing technology of artificial neural network and fuzzy logic, the motor fault detection problem can be solved using an innovative approach based on measurements that are easily accessible, without the need for rigorous mathematical models. This approach can identify and aggregate the relevant information for accurate and reliable motor fault detection. This book will introduce the neccessary concepts of neural network and fuzzy logic, describe the advantages and challenges of using these technologies to solve motor fault detection problems, and discuss several design considerations and methodologies in applying these techniques to motor incipient fault detection.
Wireless Rechargeable Sensor Networks 2019 CRC Press
This book provides a comprehensive account of the glowworm swarm optimization (GSO) algorithm, including details of the underlying ideas, theoretical foundations, algorithm development, various applications, and MATLAB programs for the basic GSO algorithm. It also discusses several research problems at different levels of sophistication that can be attempted by interested researchers. The generality of the GSO algorithm is evident in its application to diverse problems ranging from optimization to robotics. Examples include computation of multiple optima, annual crop planning, cooperative exploration, distributed search, multiple source localization, contaminant boundary mapping, wireless sensor networks, clustering, knapsack, numerical integration, solving fixed point equations, solving systems of nonlinear equations, and engineering design optimization. The book is a valuable resource for researchers as well as graduate and undergraduate students in the area of swarm intelligence and computational intelligence and working on these topics.
Information Processing and Routing in Wireless Sensor Networks World Scientific
This book constitutes the refereed proceedings of the 14th China Conference on Wireless Sensor Networks, CWSN 2020 held in Dunhuang, China, in September 2020. The 20 full papers were carefully reviewed and selected from 85 submissions. The papers are organized in topical sections on wireless sensor network theory and technology, basic theory and application of internet of things, internet of things security and privacy protection, and perception and positioning.
Methodologies Of Using Neural Network And Fuzzy Logic Technologies For Motor Incipient Fault Detection Springer Science & Business Media
This book constitutes the refereed conference proceedings of the 9th International Conference on Mobile Wireless Middleware, Operating Systems and Applications, MOBILWARE 2020, held in Hohhot, China, in July 2020. Due to COVID-19 pandemic the conference was held virtually. The 21 revised full papers were reviewed and selected from 69 submissions and are organized in tracks on MobilWare; Big data, data mining and artificial intelligence workshop; Blockchain and internet of things workshop.
Security in Ad Hoc and Sensor Networks Springer Nature
Information technology is the enabling foundation for all of human activity at the beginning of the 21st century, and advances in this area are crucial to all of us. These advances are taking place all over the world and can only be followed and perceived when researchers from all over the world assemble, and exchange their ideas in conferences such as the one presented in this proceedings volume regarding the 26th International Symposium on Computer and Information Systems, held at the Royal Society in London on 26th to 28th September 2011. Computer and Information Sciences II contains novel advances in the state of the art covering applied research in electrical and computer engineering and computer science, across the broad area of information technology. It provides access to the main innovative activities in research across the world, and points to the results obtained recently by some of the most active teams in both Europe and Asia.
Computer and Information Sciences II Springer Nature
The harvesting of energy from ambient energy sources to power electronic devices has been recognized as a promising solution to the issue of powering the ever-growing number of mobile devices around us.Key technologies in the rapidly growing field of energy harvesting focus on developing solutions to capture ambient energy surrounding the mobile devices and convert it into usable electrical energy for the purpose of recharging said devices. Achieving a sustainable network lifetime via battery-aware designs brings forth a new frontier for energy optimization techniques. These techniques had, in their early stages, resulted in the development of low-power hardware designs. Today, they have evolved into power-aware designs and even battery-aware designs.This

book covers recent results in the field of rechargeable sensor networks, including technologies and protocol designs to enable harvesting energy from alternative energy sources such as vibrations, temperature variations, wind, solar, and biochemical energy and passive human power.

Wireless Communication And Sensor Network - Proceedings Of The International Conference (Wcsn 2015) World Scientific

This in-depth technical guide is an essential resource for anyone involved in the development of "smart mobile wireless technology, including devices, infrastructure, and applications. Written by researchers active in both academic and industry settings, it offers both a big-picture introduction to the topic and detailed insights into the technical details underlying all of the key trends. Smart Phone and Next-Generation Mobile Computing shows you how the field has evolved, its real and potential current capabilities, and the issues affecting its future direction. It lays a solid foundation for the decisions you face in your work, whether you're a manager, engineer, designer, or entrepreneur. - Covers the convergence of phone and PDA functionality on the terminal side, and the integration of different network types on the infrastructure side - Compares existing and anticipated wireless technologies, focusing on 3G cellular networks and wireless LANs - Evaluates terminal-side operating systems/programming environments, including Microsoft Windows Mobile, Palm OS, Symbian, J2ME, and Linux - Considers the limitations of existing terminal designs and several pressing application design issues - Explores challenges and possible solutions relating to the next phase of smart phone development, as it relates to services, devices, and networks - Surveys a collection of promising applications, in areas ranging from gaming to law enforcement to financial processing

Wireless Sensor Networks and Energy Efficiency: Protocols, Routing and Management World Scientific

This book presents the latest findings in the areas of data management and smart computing, big data management, artificial intelligence and data analytics, along with advances in network technologies. It addresses state-of-the-art topics and discusses challenges and solutions for future development. Gathering original, unpublished contributions by scientists from around the globe, the book is mainly intended for a professional audience of researchers and practitioners in academia and industry.

Glowworm Swarm Optimization World Scientific

The collaborative nature of industrial wireless sensor networks (IWSNs) brings several advantages over traditional wired industrial monitoring and control systems, including self-organization, rapid deployment, flexibility, and inherent intelligent processing. In this regard, IWSNs play a vital role in creating more reliable, efficient, and productive industrial systems, thus improving companies' competitiveness in the marketplace. Industrial Wireless Sensor Networks: Applications, Protocols, and Standards examines the current state of the art in industrial wireless sensor networks and outlines future directions for research. What Are the Main Challenges in Developing IWSN Systems? Featuring contributions by researchers around the world, this book explores the software and hardware platforms, protocols, and standards that are needed to address the unique challenges posed by IWSN systems. It offers an in-depth review of emerging and already deployed IWSN applications and technologies, and outlines technical issues and design objectives. In particular, the book covers radio technologies, energy harvesting techniques, and network and resource management. It also discusses issues critical to industrial applications, such as latency, fault tolerance, synchronization, real-time constraints, network security, and cross-layer design. A chapter on standards highlights the need for specific wireless communication standards for industrial applications. A Starting Point for Further Research Delving into wireless sensor networks from an industrial perspective, this comprehensive work provides readers with a better understanding of the potential advantages and research challenges of IWSN applications. A contemporary reference for anyone working at the cutting edge of industrial automation, communication systems, and networks, it will inspire further exploration in this promising research area.

Sensor Technology: Concepts, Methodologies, Tools, and Applications World Scientific

This proceedings volume collects the most up-to-date, comprehensive and state-of-the-art knowledge on wireless communication, sensor network, network technologies, services and application.Written by world renowned researchers, each chapter is original in content, featuring high-impact presentations and late-breaking contributions.Researchers and practitioners will find this edition a useful resource material and an inspirational read.

Energy Management in Wireless Sensor Networks Springer Nature

Provides unique coverage of wireless sensor system applications in space, underwater, underground, and extreme industrial environments in one volume This book covers the challenging aspects of wireless sensor systems and the problems and conditions encountered when applying them in outer space, under the water, below the ground, and in extreme industrial environments. It explores the unique aspects of designs and solutions that address those problems and challenges, and illuminates the connections, similarities, and differences between the challenges and solutions in those various environments. The creation of Wireless Sensor Systems for Extreme Environments is a response to the spread of wireless sensor technology into fields of health, safety, manufacturing, space, environmental, smart cities, advanced robotics, surveillance, and agriculture. It is the first of its kind to present, in a single reference, the unique aspects of wireless sensor system design, development, and deployment in such extreme environments—and to explore the similarities and possible synergies between them. The application of wireless sensor systems in these varied environments has been lagging dramatically behind their application in more conventional environments, making this an especially relevant book for investigators and practitioners in all of these areas. Wireless Sensor Systems for Extreme Environments is presented in five parts that cover: Wireless Sensor Systems for Extreme Environments—Generic Solutions Space WSS Solutions and Applications Underwater and Submerged WSS Solutions Underground and Confined Environments WSS Solutions Industrial and Other WSS Solutions This book is a welcome guide for researchers, post-graduate students, engineers and scientists who design and build operational and environmental control systems, emergency response systems, and situational awareness systems for unconventional environments.

Industrial Wireless Sensor Networks IGI Global

Security issues in ad hoc and sensor networks have become extremely important. This edited book provides a comprehensive treatment for security issues in these networks, ranging from attack mitigation to recovery after an attack has been successfully executed. Security issues addressed include (but are not limited to) attacks, malicious node detection, access control, authentication, intrusion detection, privacy and anonymity, key management, location verification, security architectures and protocols, secrecy and integrity, network resilience and survivability, and trust models. This complete book provides an excellent reference for students, researchers, and industry practitioners related to these areas.

Neural Networks for Intelligent Signal Processing CRC Press

Energy Management in Wireless Sensor Networks discusses this unavoidable issue in the application of Wireless Sensor Networks (WSN). To guarantee efficiency and durability in a network, the science must go beyond hardware solutions and seek alternative software solutions that allow for better data control from the source to delivery. Data transfer must obey different routing protocols, depending on the application type and network architecture. The correct protocol should allow for fluid information flow, as well as optimizing power consumption and resources – a challenge faced by dense networks. The topics covered in this book provide answers to these needs by introducing and exploring computer-based tools and protocol strategies for low power consumption and the implementation of routing mechanisms which include several levels of intervention, ranging from deployment to network operation. - Explores ways to manage energy consumption during the design and implementation of WSN - Helps users implement an increase in network longevity - Presents intrinsic characteristics of wireless sensor networks

Applications of Neural Adaptive Control Technology John Wiley & Sons

This book is the definitive guide to the techniques and applications of position location, covering both terrestrial and satellite systems. It gives all the techniques, theoretical models, and algorithms that engineers need to improve their current location schemes and to develop future location algorithms and systems. Comprehensive coverage is given to system design trade-offs, complexity issues, and the design of efficient positioning algorithms to enable the creation of high-performance location positioning systems. Traditional methods are also reexamined in the context of the challenges posed by reconfigurable and multihop networks. Applications discussed include wireless networks (WiFi, ZigBee, UMTS, and DVB networks), cognitive radio, sensor networks and multihop networks. Features - Contains a complete guide to models, techniques, and applications of position location - Includes applications to wireless networks, demonstrating the relevance of location positioning to these "hot" areas in research and development - Covers system design trade-offs and the design of efficient positioning algorithms, enabling the creation of future location positioning systems - Provides a theoretical underpinning for understanding current position location algorithms, giving researchers a foundation to develop future algorithms David Muñoz is Director and César Vargas is a member of the Center for Electronics and Telecommunications, Tecnológico de Monterrey, Mexico. Frantz Bouchereau is a senior communications software developer at The MathWorks Inc. in Natick, MA. Rogerio Enríquez-Caldera is at Instituto Nacional de Atrofisica, Optica y Electronica (INAOE), Puebla, Mexico. - Contains a complete guide to models, techniques and applications of position location - Includes applications to wireless networks (WiFi, ZigBee, DVB networks), cognitive radio, sensor networks and reconfigurable and multi-hop networks, demonstrating the relevance of location positioning to these 'hot' areas in research and development - Covers system design trade-offs, and the design of efficient positioning algorithms enables the creation of future location positioning systems - Provides a theoretical underpinning for understanding current position location algorithms, giving researchers a foundation to develop future algorithms

Smart Environments CRC Press

Seven years have passed since the publication of the previous edition of this book. During that time, sensor technologies have made a remarkable leap forward. The sensitivity of the sensors became higher, the dimensions became smaller, the sel- tivity became better, and the prices became lower. What have not changed are the fundamental principles of the sensor design. They are still governed by the laws of Nature. Arguably one of the greatest geniuses who ever lived, Leonardo Da Vinci, had his own peculiar way of praying. He was saying, "Oh Lord, thanks for Thou do not violate your own laws. " It is comforting indeed that the laws of Nature do not change as time goes by; it is just our appreciation of them that is being re?ned. Thus, this new edition examines the same good old laws of Nature that are employed in the designs of various sensors. This has not changed much since the previous edition. Yet, the sections that describe the practical designs are revised substantially. Recent ideas and developments have been added, and less important and nonessential designs were dropped. Probably the most dramatic recent progress in the sensor technologies relates to wide use of MEMS and MEOMS (micro-electro-mechanical systems and micro-electro-opto-mechanical systems). These are examined in this new edition with greater detail. This book is about devices commonly called sensors. The invention of a - croprocessor has brought highly sophisticated instruments into our everyday lives.

Smart Phone and Next Generation Mobile Computing Elsevier

This book presents state-of-the-art cross-layer optimization techniques for energy-efficient information processing and routing in wireless sensor networks. Besides providing a survey on this important research area, three specific topics are discussed in detail OCo information processing in a collocated cluster, information transport over a tree substrate, and information routing for computationally intensive applications. The book covers several important system knobs for cross-layer optimization, including voltage scaling, rate adaptation, and tunable compression. By exploring tradeoffs of energy versus latency and computation versus communication using these knobs, significant energy conservation is achieved. Sample Chapter(s). Chapter 1: Introduction to Wireless Sensor Networks (421 KB). Contents: Introduction of Wireless Sensor Networks; Background; Energy Models; Information Processing within a Collocated Cluster; Information Transportation over a Tree Substrate; Information Routing with Tunable Compression. Readership: Researchers and graduate students in networking and electrical engineering."

Machine-to-Machine Communications World Scientific

With the number of machine-to-machine (M2M)–enabled devices projected to reach 20 to 50 billion by 2020, there is a critical need to understand the demands imposed by such systems. Machine-to-Machine Communications: Architectures, Technology, Standards, and Applications offers rigorous treatment of the many facets of M2M communication, including its integration with current technology. Presenting the work of a different group of international experts in each chapter, the book begins by supplying an overview of M2M technology. It considers proposed standards, cutting-edge applications, architectures, and traffic modeling and includes case studies that highlight the differences between traditional and M2M communications technology. Details a practical scheme for the forward error correction code design Investigates the effectiveness of the IEEE 802.15.4 low data rate wireless personal area network standard for use in M2M communications Identifies algorithms that will ensure functionality, performance, reliability, and security of M2M systems Illustrates the relationship between M2M systems and the smart power grid Presents techniques to ensure integration with and adaptation of existing communication systems to carry M2M traffic Providing authoritative insights into the technologies that enable M2M communications, the book discusses the challenges posed by the use of M2M communications in the smart grid from the aspect of security and proposes an efficient intrusion detection system to deal with a number of possible attacks. After reading this book, you will develop the understanding required to solve problems related to the design, deployment, and operation of M2M communications networks and systems.