Radio Engineering For Wireless Communication And Sensor Applications Artech House Mobile Communications Series

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Introduction to Wireless Sensor Networks - Anna Forster 2016-07-12
Explores real-world wireless sensor network development, deployment, and applications Presents state-of-the-art protocols and algorithms Includes end-of-chapter summaries, exercises, and references For students, there are hardware overviews, reading links, programming examples, and tests available at [website] For Instructors, there are PowerPoint slides and solutions available at [website]
Proceedings of Ninth International Conference on Wireless Communication and Sensor Networks - Radhakrishna Maringanti 2014-04-22
Wireless communication and sensor networks would form the backbone to create pervasive and ubiquitous environments that would have profound influence on the society and thus are important to the society. The wireless communication technologies and wireless sensor networks would encompass a wide range of domains such as HW devices such as motes, sensors and associated instrumentation, actuators, transmitters, receivers, antennas, etc., sensor network aspects such as topologies, routing algorithms, integration of heterogeneous network elements and topologies, designing RF devices and systems for energy efficiency and reliability etc. These sensor networks would provide opportunity to continuously and in a distributed manner monitor the environment and generate the necessary warnings and actions. However most of the developments have been demonstrated only in controlled and laboratory environments. So we are yet to see those powerful, ubiquitous applications for the benefit of the society. The conference and consequentially the proceedings would provide opportunity to the researchers to interact with other researchers and share their researches covering all the above areas. The proceedings of the conference thus covers the research work of different authors in the area of wireless sensor networks, wireless communications, devices, tools and techniques for WSN, and applications of wireless sensor networks. This book is beneficial for those researchers who are working in the area of wireless sensor networks, wireless communication, and developing applications of Wireless sensor networks.
Intelligent Automation and Computer Engineering - Oscar Castillo 2010-07-17
A large international conference in Intelligent Automation and Computer Engineering was held in Hong Kong, March 18-20, 2009, under the auspices of the International MultiConference of Engineers and Computer Scientists (IMECS 2009). The IMECS is organized by the International Association of Engineers (IAENG). Intelligent Automation and Computer Engineering contains 37 revised and extended research articles written by prominent researchers participating in the conference. Topics covered include artificial intelligence, decision supporting systems, automated planning, automation systems, control engineering, systems identification, modelling and simulation, communication systems, signal processing, and industrial applications. Intelligent Automation and Computer Engineering offers the state of the art of tremendous advances in intelligent automation and computer engineering and also serves as an excellent reference text for researchers and graduate students, working on intelligent automation and computer engineering.
Software-Defined Radio for Engineers - Alexander M. Wyglinski 2018-04-30
Based on the popular Artech House classic, Digital Communication Systems Engineering with Software-Defined Radio, this book provides a practical approach to quickly learning the software-defined radio (SDR) concepts needed for work in the field. This up-to-date volume guides readers on how to quickly prototype wireless designs using SDR for real-world testing and experimentation. This book explores advanced wireless communication techniques such as OFDM, LTE, WLA, and hardware targeting. Readers will gain an understanding of the core concepts behind wireless hardware, such as the radio frequency front-end, analog-to-digital and digital-to-analog converters, as well as various processing technologies. Moreover, this volume includes chapters on timing estimation, matched filtering, frame synchronization message decoding, and source coding. The orthogonal frequency division multiplexing is explained and details about HDL code generation and deployment are provided. The book concludes with coverage of the WLAN toolbox with OFDM beacon reception and the LTE toolbox with downlink reception. Multiple case studies are provided throughout the book. Both MATLAB and Simulink source code are included to assist readers with their projects in the field.
Short-range Wireless Communication - Alan Bensky 2019-06-15
Short-range Wireless Communication, Third Edition describes radio theory and applications for wireless communication with ranges of centimeters to hundreds of meters. Topics covered include radio wave propagation, the theory of antennas and transmission lines, architectures of transmitters, and radio system design guidelines as a function of basic communication parameters, such as sensitivity, noise and bandwidth. Topics new to this edition include MIMO, metamaterials, inductance coupling for loop antennas, very high throughput Wi-Fi specifications, Bluetooth Low Energy, expanded coverage of RFID, wireless security, location awareness, wireless sensor networks, Internet of Things, millimeter wave and optical short-range communications, body area networks, energy harvesting, and more. Engineers, programmers, technicians and sales management personnel who support short-range wireless products will find the book a comprehensive and highly readable source to boost on-the-job performance and satisfaction. Presents comprehensive, up-to-date coverage of short-range wireless technologies Provides an in-depth explanation of wave propagation and antennas Describes communication system components and specifications, including transmitters, receivers, frequency synthesizers, sensitivity, noise, distortion, and more Includes an introduction to error detection and correction
Wireless Communications - Saad Z. Asif 2007
Provides a comprehensive treatment of the evolution of wireless communications to help practitioners keep pace with the developments in their field. This book offers guidance on various critical topics, including inter-networking of 3G CDMA (code division multiple access), broadband wireless, CDMA wireless local loop and wireless LAN, and more.
Wireless Information Networks - Kaveh Pahlavan 2005-11-07
Towards location aware mobile ad hoc sensors A Systems Engineering Approach to Wireless Information Networks The Second Edition of this internationally respected textbook brings readers fully up to date with the myriad of developments in wireless communications. When first published in 1995, wireless communications was synonymous with cellular telephones. Now wireless information networks are the most important technology in all branches of telecommunications. Readers can learn about the latest applications in such areas as ad hoc sensor networks, home networking, and wireless positioning. Wireless Information Networks takes a systems engineering approach: technical topics are presented in the context of how they fit into the ongoing development of new systems and services, as well as the recent developments in national and international spectrum allocations and standards. The authors have organized the myriad of current and emerging wireless technologies into logical categories: * Introduction to Wireless Networks presents an up-to-the-moment discussion of the evolution of the cellular industry from analog cellular technology to 2G,

3G, and 4G, as well as the emergence of WLAN and WPAN as broadband ad hoc networks * Characteristics of Radio Propagation includes new coverage of channel modeling for space-time, MIMO, and UWB communications and wireless geolocation networks * Modem Design offers new descriptions of space-time coding, MIMO antenna systems, UWB communications, and multi-user detection and interference cancellation techniques used in CDMA networks * Network Access and System Aspects incorporates new chapters on UWB systems and RF geolocations, with a thorough revision of wireless access techniques and wireless systems and standards Exercises that focus on real-world problems are provided at the end of each chapter. The mix of assignments, which includes computer projects and questionnaires in addition to traditional problem sets, helps readers focus on key issues and develop the skills they need to solve actual engineering problems. Extensive references are provided for those readers who would like to explore particular topics in greater depth. With its emphasis on knowledge-building to solve problems, this is an excellent graduate-level textbook. Like the previous edition, this latest edition will also be a standard reference for the telecommunications industry.

Advances in Mobile Radio Access Networks - Y. Jay Guo 2004

As the demand for and the variety of 3G services increase, more advanced hardware and software technologies will be needed to enhance the mobile radio communications infrastructure. This forward-looking book delivers a comprehensive overview of the advanced technologies driving the evolution of mobile radio access networks, focusing on high-level architectural issues and system engineering. The book highlights the advantages and drawbacks of these advanced technologies and helps you make strategic decisions on R&D planning and system deployment.

Wireless Networking Based Control - Sudip K. Mazumder 2014-11-26

This book will have a broad appeal in the area of Wireless Networking-Based Control. Various engineering disciplines, control and communication science organizations will be interested in purchasing the book with a new, emerging, and important theme. Also, industry such as Honeywell and those (e.g. power industry, automotive industry, aerospace industry) interested in implementing wireless network control to express interest in purchasing this book.

RF and Wireless Technologies: Know It All - Bruce A. Fette 2007-09-26

The Newnes Know It All Series takes the best of what our authors have written to create hard-working desk references that will be an engineer's first port of call for key information, design techniques and rules of thumb. Guaranteed not to gather dust on a shelf! RF (radio frequency) and wireless technologies drive communication today. This technology and its applications enable wireless phones, portable device roaming, and short-range industrial and commercial application communication such as the supply chain management wonder, RFID. Up-to-date information regarding software defined RF, using frequencies smarter, and using more of the spectrum, with ultrawideband technology is detailed. A 360-degree view from best-selling authors including Roberto Aiello, Bruce Fette, and Praphul Chandra Hot topics covered including ultrawideband and cognitive radio technologies The ultimate hard-working desk reference: all the essential information, techniques, and tricks of the trade in one volume

Wireless Communication - Prashant Ranjan 2022-08-10

This reference text will benefit readers in enhancing their understanding of the recent technologies, protocols, and challenges in various stages of development of wireless communication and networking. The text discusses the cellular concepts of 4G, 5G, and 6G along with their challenges. It covers topics related to vehicular technology, wherein vehicles communicate with the traffic and the environment around them using short-range wireless signals. The text comprehensively covers important topics including use of the Internet of Things (IoT) in wireless communication, architecture, and protocols. It further covers the role of smart antennas in emerging wireless technologies. The book Discusses advanced techniques used in the field of wireless communication. Covers technologies including network slicing, 5G wireless communication, and TV white space technology. Discusses practical applications including drone delivery systems, public safety, IoT, virtual reality, and smart cities. Covers radio theory and applications for wireless communication with ranges of centimeters to hundreds of meters. Discusses important topics including metamaterials, inductance coupling for loop antennas, bluetooth low energy, wireless security, and wireless sensor networks. Discussing latest technologies including 5G, 6G, IoT, vehicular technology and TV white space technology, this text will be useful for senior undergraduate, graduate students, and professionals in the fields of electrical engineering, and electronics and communication engineering.

Cognitive Radio, Mobile Communications and Wireless Networks - Mubashir Husain Rehmani 2018-07-30

This book provides an overview of the latest research and development of new technologies for cognitive radio, mobile communications, and wireless networks. The contributors discuss the research and requirement analysis and initial standardization work towards 5G cellular systems and the capacity problems it presents. They show how cognitive radio, with the capability to flexibly adapt its parameters, has been proposed as the enabling technology for unlicensed secondary users to dynamically access the licensed spectrum owned by legacy primary users on a negotiated or an opportunistic basis. They go on to show how cognitive radio is now perceived in a much broader paradigm that will contribute to solve the resource allocation problem that 5G requirements raise. The chapters represent hand-selected expanded papers from EAI sponsored and hosted conferences such as the 12th EAI International Conference on Mobile and Ubiquitous Systems, the 11th EAI International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness, the 10th International Conference on Cognitive Radio Oriented Wireless Networks, the 8th International Conference on Mobile Multimedia Communications, and the EAI International Conference on Software Defined Wireless Networks and Cognitive Technologies for IoT.

Propagation Engineering in Wireless Communications - Abdollah Ghasemi 2011-09-23

Propagation Engineering in Wireless Communications covers the basic principles needed for understanding of radiowaves propagation for common frequency bands used in radio-communications. This book includes descriptions of new achievements and new developements in propagation models for wireless communication. The book is intended to bridge the gap between the theoretical calculations and approaches to the applied procedures needed for radio links design in a proper manner. The authors intention is to emphasize propagation engineering by giving sufficient fundamental information and then going on to explain the use of basic principles together with technical achievements in this field.

Multigigabit Microwave and Millimeter-Wave Wireless Communications - Jonathan Wells 2010

For decades, microwave radios in the 6 to 50 GHz bands have been providing wireless communications. Recently, newer technologies at the 60 to 100 GHz mm-wave bands have taken advantage of new wireless regulations that are designed to enable ultra-high capacity communications. Exploring this exciting area in depth, this cutting-edge resource offers you the latest details on multigigabit wireless communications. The book places emphasis on practical use and applications, but also provides a thorough explanation of important technological underpinnings to give you a complete understanding of subject.You find clear guidance on system design and link planning, helping you to determine performance levels given the physical limitations of operating in these frequency bands. Supported with over 50 illustrations, the book covers a wide range of critical topics, from the high frequency electromagnetic spectrum and high data rate mm-wave radios, to wireless link margins and path profiling.

Wireless Communication and Sensor Network - Salah Bourennane 2016-06-29

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. Contents:Wireless CommunicationsNetwork TechnologiesServices and Application Readership: Researchers, academics, professionals and graduate students in neural networks/networking, electrical & electronic engineering, and condensed matter physics.

Green Radio Communication Networks - Ekram Hossain 2012-07-05

Presents state-of-the-art research on green radio communications and networking technology to researchers and professionals working in wireless communication.

Military Communications in the Future Battlefield - Marko Suojanen 2018-07-31

Taking an applications-oriented view, this unique volume delivers a forward-looking roadmap to military communications. This hands-on reference offers military and security technology practitioners insights

into the key issues related to long-term development within the battlefield communications area. The book presents the technological alternatives for communication in the battlefield in unexpected situations and environments. This authoritative resource discusses unstructured formations of actors using a holistic approach that considers key capability requirements. Professionals and officers learn how to prepare for the unexpected and start building agile, adaptive and cognitive systems that are needed in future operating environments. From scenario-based capability planning...to situational and context awareness...to unmanned ground and aerial platforms, this easy-to-understand book covers the critical topics that practitioners need to master to achieve top performance in the battlefield.

Cognitive Radio Sensor Networks: Applications, Architectures, and Challenges - Rehmani, Mubashir Husain 2014-06-30

"This book examines how wireless sensor nodes with cognitive radio capabilities can address these network challenges and improve the spectrum utilization, presenting a broader picture on the applications, architecture, challenges, and open research directions in the area of WSN research"--Provided by publisher.

Wireless Sensor Networks - Jun Zheng 2009-09-28

Learn the fundamental concepts, major challenges, and effective solutions in wireless sensor networking This book provides a comprehensive and systematic introduction to the fundamental concepts, major challenges, and effective solutions in wireless sensor networking (WSN). Distinguished from other books, it focuses on the networking aspects of WSNs and covers the most important networking issues, including network architecture design, medium access control, routing and data dissemination, node clustering, node localization, query processing, data aggregation, transport and quality of service, time synchronization, network security, and sensor network standards. With contributions from internationally renowned researchers, Wireless Sensor Networks expertly strikes a balance between fundamental concepts and state-of-the-art technologies, providing readers with unprecedented insights into WSNs from a networking perspective. It is essential reading for a broad audience, including academic researchers, research engineers, and practitioners in industry. It is also suitable as a textbook or supplementary reading for electrical engineering, computer engineering, and computer science courses at the graduate level.

Backscattering and RF Sensing for Future Wireless Communication - Qammer H. Abbasi 2021-05-03

Backscattering and RF Sensing for Future Wireless Communication Discover what lies ahead in wireless communication networks with this insightful and forward-thinking book written by experts in the field Backscattering and RF Sensing for Future Wireless Communication delivers a concise and insightful picture of emerging and future trends in increasing the efficiency and performance of wireless communication networks. The book shows how the immense challenge of frequency saturation could be met via the deployment of intelligent planar electromagnetic structures. It provides an in-depth coverage of the fundamental physics behind these structures and assesses the enhancement of the performance of a communication network in challenging environments, like densely populated urban centers. The distinguished editors have included resources from a variety of leading voices in the field who discuss topics such as the engineering of metasurfaces at a large scale, the electromagnetic analysis of planar metasurfaces, and low-cost and reliable backscatter communication. All of the included works focus on the facilitation of the development of intelligent systems designed to enhance communication network performance. Readers will also benefit from the inclusion of: A thorough introduction to the evolution of wireless communication networks over the last thirty years, including the imminent saturation of the frequency spectrum An exploration of state-of-the-art techniques that next-generation wireless networks will likely incorporate, including software-controlled frameworks involving artificial intelligence An examination of the scattering of electromagnetic waves by metasurfaces, including how wave propagation differs from traditional bulk materials A treatment of the evolution of artificial intelligence in wireless communications Perfect for researchers in wireless communications, electromagnetics, and urban planning, Backscattering and RF Sensing for Future Wireless Communication will also earn a place in the libraries of government policy makers, technologists, and telecom industry stakeholders who wish to get a head start on understanding the technologies that will enable tomorrow’s wireless communications.

Handbook of RF and Wireless Technologies - Farid Dowla 2003-11-20

Expert contributors drawn from the ranks of academia and industry have authored chapters in such areas as third-generation wireless, wireless sensor networks, RF power amplifiers, spread spectrum modulation, signal propagation, antennas, and other key subjects that engineers working in RF and wireless need to be familiar with. This is far more than just a tutorial or reference guide—it is a "guided tour" through the world of cutting-edge RF and wireless design, combining theory, applications, and philosophies behind the RF/wireless design process. The multiple and sometimes overlapping chapters reiterate and emphasize the fundamentals in the context of different types of wireless applications. Here are just a few benefits that readers will gain from reading this book: *A refresher and update of wireless principles and techniques. *Information about the latest (and forthcoming) RF and wireless circuits, products and systems. *Guidelines, approaches, and techniques to RF/wireless design. *Examples of typical applications with an emphasis on real-world situations including existing and forthcoming new components and integrated circuits. *Coverage of new and emerging wireless topics heretofore not widely covered in print (e.g. UWB, RFID, IR, etc.) * A comprehensive survey of current RF and wireless engineering practice * Heavy emphasis on practical applications and design guidelines * Multiple contributors assure a wide range of perspectives and avoids individual bias

Sensing Techniques for Next Generation Cognitive Radio Networks - Bagwari, Ashish 2018-08-30

The inadequate use of wireless spectrum resources has recently motivated researchers and practitioners to look for new ways to improve resource efficiency. As a result, new cognitive radio technologies have been proposed as an effective solution. Sensing Techniques for Next Generation Cognitive Radio Networks is a pivotal reference source that provides vital research on the application of spectrum sensing techniques. While highlighting topics such as radio identification, compressive sensing, and wavelet transform, this publication explores the standards and the methods of cognitive radio network architecture. This book is ideally designed for IT and network engineers, practitioners, and researchers seeking current research on radio scene analysis for cognitive radios and networks.

A Complete Guide to Wireless Sensor Networks - Ankur Dumka 2019-05-31

This book provides comprehensive coverage of the major aspects in designing, implementing, and deploying wireless sensor networks by discussing present research on WSNs and their applications in various disciplines. It familiarizes readers with the current state of WSNs and how such networks can be improved to achieve effectiveness and efficiency. It starts with a detailed introduction of wireless sensor networks and their applications and proceeds with layered architecture of WSNs. It also addresses prominent issues such as mobility, heterogeneity, fault-tolerance, intermittent connectivity, and cross layer optimization along with a number of existing solutions to stimulate future research.

Radio Engineering for Wireless Communication and Sensor Applications - Antti V. R¨ais¨anen 2003

Covering a wide range of application areas, from wireless communications and navigation, to sensors and radar, this practical resource offers you the first comprehensive, multidisciplinary overview of radio engineering. You learn important techniques to help you with the generation, control, detection and utilization of radio waves, and find detailed guidance in radio link, amplifier, and antenna design. The book approaches relevant problems from both electromagnetic theory based on MaxwellOCOs equations and circuit theory based on KirchoffOCOs and OhmOCOs laws, including brief introductions to each theory."

New Directions in Wireless Communications Systems - Athanasios G. Kanatas 2017-10-16

Beyond 2020, wireless communication systems will have to support more than 1,000 times the traffic volume of today's systems. This extremely high traffic load is a major issue faced by 5G designers and researchers. This challenge will be met by a combination of parallel techniques that will use more spectrum more flexibly, realize higher spectral efficiency, and densify cells. Novel techniques and paradigms must be developed to meet these goals. The book addresses diverse key-point issues of next-generation wireless communications systems and identifies promising solutions. The book's core is concentrated to techniques and methods belonging to what is generally called radio access network.

Globalization of Mobile and Wireless Communications - Ramjee Prasad 2010-11-30

Globalization of Mobile and Wireless Communications is a collection of

cutting-edge research in mobile and wireless communications with impact on developments as far forward as 2020 and beyond. The book draws upon the insights and performed research work of leading experts in the field. Topics of discussion are related but not limited to spectrum-efficient radio interface technologies, enabling technologies for reconfigurability, wireless sensor networks, cognitive networks, coherent wireless transmission, algorithmic design, middleware for novel services and applications. The material has been edited to provide a vision for the future of mobile and wireless, towards a dynamic communication system that breaks down the barriers between communications means; and evolves and integrates business models and culture to match the technological evolution. In addition, strategies on how to overcome the technological challenges for achieving that vision are also outlined.

Achieving Interoperability in Critical IT and Communication Systems - Robert I. Desourdis 2009

Supported by over 90 illustrations, this unique book provides a detailed examination of the subject, focusing on the use of voice, data, and video systems for public safety and emergency response. This practical resource makes in-depth recommendations spanning technical, planning, and procedural approaches to provide efficient public safety response performance. You find covered the many approaches used to achieve interoperability, including a synopsis of the enabling technologies and systems intended to provide radio interoperability. Featuring specific examples nationwide, the book takes you from strategy to proper implementation, using enterprise architecture, systems engineering, and systems integration planning.

Fundamentals of Wireless Communication Engineering Technologies - K. Daniel Wong 2011-12-20

A broad introduction to the fundamentals of wirelesscommunication engineering technologies Covering both theory and practical topics, Fundamentals ofWireless Communication Engineering Technologies offers a soundsurvey of the major industry-relevant aspects of wirelesscommunication engineering technologies. Divided into four mainsections, the book examines RF, antennas, and propagation; wirelessaccess technologies; network and service architectures; and othertopics, such as network management and security, policies andregulations, and facilities infrastructure. Helpfulcross-references are placed throughout the text, offeringadditional information where needed. The book provides: Coverage that is closely aligned to the IEEE's WirelessCommunication Engineering Technologies (WCET) certification programsyllabus, reflecting the author's direct involvement in the development of theprogram A special emphasis on wireless cellular and wireless LANsystems An excellent foundation for expanding existing knowledge in thewireless field by covering industry-relevant aspects of wirelesscommunication Information on how common theories are applied in real-worldwireless systems With a holistic and well-organized overview of wirelesscommunications, Fundamentals of Wireless CommunicationEngineering Technologies is an invaluable resource for anyoneinterested in taking the WCET exam, as well as practicingengineers, professors, and students seeking to increase theirknowledge of wireless communication engineering technologies.

Wireless Networking: Know It All - Praphul Chandra 2007-09-14

The Newnes Know It All Series takes the best of what our authors have written to create hard-working desk references that will be an engineer's first port of call for key information, design techniques and rules of thumb. Guaranteed not to gather dust on a shelf! Wireless Networking: Know It All delivers readers from the basics of a wireless system such as antennas and transmitters to current hot topic wireless systems and technologies. The backbone to technologies and applications such as mobile, untethered Internet access, Internet telephony, and high quality multimedia content via the Web is completely covered in this reference. Chapter 1. Basics of Wireless Communications Chapter 2. Basics of Wireless Local Area Networks Chapter 3. Radio Transmitters and Receivers Chapter 4. Radio Propagation Chapter 5. Antennas and Transmission Lines Chapter 6. Communication Protocols and Modulation Chapter 7. High-Speed Wireless Data: System Types, Standards-Based and Proprietary Solutions Chapter 8. Propagation Modeling and Measuring Chapter 9. Indoor Networks Chapter 10. Security in Wireless Local Area Networks Chapter 11. Voice Over Wi-Fi and Other Wireless Technologies Chapter 12. Mobile Ad Hoc Networks Chapter 13. Wireless Sensor Networks Chapter 14. Reliable Wireless Networks for Industrial Applications Chapter 15. Applications and Technologies Chapter 16. System Planning *A comprehensive overview from best-selling authors including Daniel Dobkin, Ron Olexa, and Alan Bensky *Explains the theory, concepts, design, and implementation of 802.11, 802.16, and 802.20 wireless networks – the three most popular types *Includes discussion of indoor networks, signal propagation, network security, and other topics essential for designing robust, secure wireless networks

Cognitive Networks - Jaime Lloret Mauri 2014-12-09

A cognitive network makes use of the information gathered from the network in order to sense the environment, plan actions according to the input, and make appropriate decisions using a reasoning engine. The ability of cognitive networks to learn from the past and use that knowledge to improve future decisions makes them a key area of interest for anyone whose work involves wireless networks and communications. Cognitive Networks: Applications and Deployments examines recent developments in cognitive networks from the perspective of cutting-edge applications and deployments. Presenting the contributions of internationally renowned experts, it supplies complete and balanced treatment of the fundamentals of both cognitive radio communications and cognitive networks—together with implementation details. The book includes case studies and detailed descriptions of cognitive radio platforms and testbeds that demonstrate how to build real-world cognitive radio systems and network architectures. It begins with an introduction to efficient spectrum management and presents a survey on joint routing and dynamic spectrum access in cognitive radio networks. Next, it examines radio spectrum sensing and network coding and design. It explores intelligent routing in graded cognitive networks and presents an energy-efficient routing protocol for cognitive radio ad hoc networks. The book concludes by considering dynamic radio spectrum access and examining vehicular cognitive networks and applications. Presenting the latest standards and spectrum policy developments, the book’s strong practical orientation provides you with the understanding you will need to participate in the development of compliant cognitive systems.

Game Theory for Wireless Communications and Networking - Yan Zhang 2011-06-21

Used to explain complicated economic behavior for decades, game theory is quickly becoming a tool of choice for those serious about optimizing next generation wireless systems. Illustrating how game theory can effectively address a wide range of issues that until now remained unresolved, Game Theory for Wireless Communications and Networking provides a systematic introduction to the application of this powerful and dynamic tool. This comprehensive technical guide explains game theory basics, architectures, protocols, security, models, open research issues, and cutting-edge advances and applications. It describes how to employ game theory in infrastructure-based wireless networks and multihop networks to reduce power consumption—while improving system capacity, decreasing packet loss, and enhancing network resilience. Providing for complete cross-referencing, the text is organized into four parts: Fundamentals—introduces the fundamental issues and solutions in applying different games in different wireless domains, including wireless sensor networks, vehicular networks, and OFDM-based wireless systems Power Control Games—considers issues and solutions in power control games Economic Approaches—reviews applications of different economic approaches, including bargaining and auction-based approaches Resource Management—explores how to use the game theoretic approach to address radio resource management issues The book explains how to apply the game theoretic model to address specific issues, including resource allocation, congestion control, attacks, routing, energy management, packet forwarding, and MAC. Facilitating quick and easy reference to related optimization and algorithm methodologies, it supplies you with the background and tools required to use game theory to drive the improvement and development of next generation wireless systems.

Wireless Power Transmission for Sustainable Electronics - Nuno Borges Carvalho 2020-02-19

Provides a collection of works produced by COST Action IC1301 with the goal of achieving significant advances in the field of wireless power transmission This book constitutes together information from COST Action IC1301, a group of academic and industry experts seeking to align research efforts in the field of wireless power transmission (WPT). It begins with a discussion of backscatter as a solution for Internet of Things (IoT) devices and goes on to describe ambient backscattering sensors that use FM broadcasting for low cost and low power wireless applications. The book also explores localization of passive RFID tags and augmented tags using nonlinearities of RFID chips. It concludes with a review of methods of electromagnetic characterization of textile materials for the development of wearable antennas. Wireless Power Transmission for Sustainable Electronics: COST WiPE - IC1301 covers

textile-supported wireless energy transfer, and reviews methods for the electromagnetic characterization of textile materials for the development of wearable antennas. It also looks at: backscatter RFID sensor systems for remote health monitoring; simultaneous localization (of robots and objects) and mapping (SLAM); autonomous system of wireless power distribution for static and moving nodes of wireless sensor networks; and more. Presents techniques for smart beam-forming for "on demand" wireless power transmission (WPT) Discusses RF and microwave energy harvesting for space applications Describes miniaturized RFID transponders for object identification and sensing Wireless Power Transmission for Sustainable Electronics: COST WiPE - IC1301 is an excellent book for both graduate students and industry engineers involved in wireless communications and power transfer, and sustainable materials for those fields.

Compressive Sensing for Wireless Communications - Radha Sankararajan 2022-09-01

Compressed Sensing (CS) is a promising method that recovers the sparse and compressible signals from severely under-sampled measurements. CS can be applied to wireless communication to enhance its capabilities. As this technology is proliferating, it is possible to explore its need and benefits for emerging applicationsCompressive Sensing for Wireless Communication provides:• A clear insight into the basics of compressed sensing• A thorough exploration of applying CS to audio, image and computer vision• Different dimensions of applying CS in Cognitive radio networks• CS in wireless sensor network for spatial compression and projection• Real world problems/projects that can be implemented and tested• Efficient methods to sample and reconstruct the images in resource constrained WMSN environmentThis book provides the details of CS and its associated applications in a thorough manner. It lays a direction for students and new engineers and prepares them for developing new tasks within the field of CS. It is an indispensable companion for practicing engineers who wish to learn about the emerging areas of interest.

Wireless Sensor Networks - Shuang-Hua Yang 2013-10-23

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.

Handbook of Research on Progressive Trends in Wireless Communications and Networking - M. A. Matin 2013-12

Wireless communications and networks are developing at an accelerated rate. This rapid development has provided individuals with new opportunities for ubiquitous communication accessibility as well as enabled real-time multimedia technologies and their supporting applications. Handbook of Research on Progressive Trends in Wireless Communications and Networking brings together advanced research on diverse topics in wireless communications and networking, including the latest developments in broadband technologies, mobile communications, wireless sensor networks, network security, and cognitive radio networks. This book serves as a comprehensive reference for upper-level students, academicians, and industry professionals interested in uncovering recent advancements in wireless communications and networking.

Toward a Universal Radio Frequency System for Special Operations Forces - National Research Council 2009-09-28

The U.S. Special Operations Command (SOCOM) was formed in response to the failed rescue attempt in 1980 of American hostages held by Iran. Among its key responsibilities, SOCOM plans and synchronizes operations against terrorist networks. Special operations forces (SOF) often operate alone in austere environments with only the items they can carry, which makes equipment size, weight, and power needs especially important. Specialized radios and supporting equipment must be carried by the teams for their radio-frequency (RF) operations. As warfighting demands on SOCOM have intensified, SOCOM's needs for significantly improved radio-frequency (RF) systems have increased. Toward a Universal Radio Frequency System for Special Operations Forces examines the current state of the art for both handheld and manpackable platform-mounted RF systems, and determines which frequencies could be provided by handheld systems. The book also explores whether or not a system that fulfills SOF's unique requirements could be deployed in a reasonable time period. Several recommendations are included to address these and other issues.

Cognitive Radio in 4G/5G Wireless Communication Systems - Shahriar Shirvani Moghaddam 2018-12-05

The limitation of the radio spectrum and the rapid growth of communication applications make optimal usage of radio resources essential. Cognitive radio (CR) is an attractive research area for 4G/5G wireless communication systems, which enables unlicensed users to access the spectrum. Delivering higher spectral efficiency, supporting the higher number of users, and achieving higher coverage and throughput are the main advantages of CR-based networks compared to conventional ones. The main goal of this book is to provide highlights of current research topics in the field of CR-based systems. The book consists of six chapters in three sections focusing on primary and secondary users, spectrum sensing, spectrum sharing, CR-based IoT, emulation attack, and interference alignment.

Wireless Communications and Applications - Patrick Sénac 2012-03-29

This book constitutes the thoroughly refereed post-conference proceedings of the First International ICST Conference on Wireless Communications and Applications, ICWCA 2011, held in Sanya, China, in August 2011. The 43 revised full papers presented were carefully reviewed and selected from around 90 submissions and cover a wide range of topics as mobile ad hoc networks, sensor networks, network architectural design, network protocol design, local area networks, MAC, routing, and transport protocols, quality of service provisioning, reliability and fault tolerance issues, resource allocation and management, signal processing, medical imaging, data aggregation techniques, security and privacy issues, wireless computing and applications for wireless network as smart grid, agriculture, health care, smart home, conditional monitoring, etc.

Wireless Communications: Designs, Circuits and Optics - Rapheal Dagget 2016-06-02

Wireless communications are an integral part of modern telecommunication systems and engineering. They rely on radio frequencies, electromagnetic waves and signals for transmission of information. The aim of this book is to provide an understanding of the multiple aspects of wireless communications like designing and modeling of circuits, wireless sensor networks, electromagnetic wave transmission, etc. Those with an interest in wireless communications would find this book insightful.

Intelligent Transportation Systems - Ahmed Abdel-Rahim 2012-03-16

Intelligent Transportation Systems (ITS) have transformed surface transportation networks through the integration of advanced communications and computing technologies into the transportation infrastructure. ITS technologies have improved the safety and mobility of the transportation network through advanced applications such as electronic toll collection, in-vehicle navigation systems, collision avoidance systems, and advanced traffic management systems, and advanced traveler information systems. In this book that focuses on different ITS technologies and applications, authors from several countries have contributed chapters covering different ITS technologies, applications, and management practices with the expectation that the open exchange of scientific results and ideas presented in this book will lead to improved understanding of ITS technologies and their applications.