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For more than 20 years, Network World has been the premier provider of information, intelligence and insight for network and IT executives responsible for the digital nervous systems of large organizations. Readers are responsible for designing, implementing and managing the voice, data and video systems their companies use to support everything from business critical applications to employee collaboration and electronic commerce.

An international panel of experts provide major research issues and a self-contained, rapid introduction to the theory and application of UWB This book delivers end-to-end coverage of recent advances in both the theory and practical design of ultra wideband (UWB) communication networks. Contributions offer a worldwide perspective on new and emerging applications, including WPAN, sensor and ad hoc networks, wireless telemetry, and telemedicine. The book explores issues related to the physical layer, medium access layer, and networking layer. Following an introductory chapter, the book explores three core areas: * Analysis of physical layer and technology issues * System design elements, including channel modeling, coexistence, and interference mitigation and control * Review of MAC and network layer issues, up to the application Case studies present examples such as network and transceiver design, assisting the reader in understanding the application of theory to real-world tasks. Ultra Wideband Wireless Communication enables technical professionals, graduate students, engineers, scientists, and academic and professional researchers in mobile and wireless communications to become conversant with the latest theory and applications by offering a survey of all important topics in the field. It also serves as an advanced mathematical treatise; however, the book is organized to allow non-technical readers to bypass the mathematical treatments and still gain an excellent understanding of both theory and practice.

This handbook introduces the basic principles and fundamentals of cyber security towards establishing an understanding of how to protect computers from hackers and adversaries. The highly informative subject matter of this handbook, includes various concepts, models, and terminologies along with examples and illustrations to demonstrate substantial technical details of the field. It motivates the readers to exercise better protection and defense mechanisms to deal with attackers and mitigate the situation. This handbook also outlines some of the exciting areas of future research where the existing approaches can be implemented. Exponential increase in the use of computers as a means of storing and retrieving security-intensive information, requires placement of adequate security measures to safeguard the entire computing and communication scenario. With the advent of Internet and its underlying technologies, information security aspects are becoming a prime concern towards protecting the networks and the cyber ecosystem from variety of threats, which is illustrated in this handbook. This handbook primarily targets professionals in security, privacy and trust to use and improve the reliability of businesses in a distributed manner, as well as computer scientists and software developers, who are seeking to carry out research and develop software in information and cyber security. Researchers and advanced-level students in computer science will also benefit from this reference.

This SpringerBrief presents adaptive resource allocation schemes for secondary users for dynamic spectrum access (DSA) in cognitive radio networks (CRNs) by considering Quality-of-Service requirements, admission control, power/rate control, interference constraints, and the impact of spectrum sensing or primary user interruptions. It presents the challenges, motivations, and applications of the different schemes. The authors discuss cloud-assisted geolocation-aware adaptive resource allocation in CRNs by outsourcing computationally intensive processing to the cloud. Game theoretic approaches are presented to solve resource allocation problems in CRNs. Numerical results are presented to evaluate the performance of the proposed methods. Adaptive Resource Allocation in Cognitive Radio Networks is designed for professionals and researchers working in the area of wireless networks. Advanced-level students in electrical engineering and computer science, especially those focused on wireless networks, will find this information helpful.

Radio Network Planning and Optimisation for UMTS, Second Edition, is a comprehensive and fully updated introduction to WCDMA radio access technology used in UMTS, featuring new content on key developments. Written by leading experts at Nokia, the first edition quickly established itself as a best-selling and highly respected book on how to dimension, plan and optimise UMTS networks. This valuable text examines current and future radio network management issues and their impact on network performance as well as the relevant capacity and coverage enhancement methods. In addition to coverage of WCDMA radio access technology used in UMTS, and the planning and optimisation of such a system, the service control and management concept in WCDMA and GPRS networks are also introduced. This is an excellent source of information for those considering future cellular networks where Quality of Service (QoS) is of paramount importance. Key features of the Second Edition include: High-Speed Downlink Packet Access (HSDPA) – physical layer, dimensioning and radio resource management Quality of Service (QoS) mechanisms in network for service differentiation Multiple Input – Multiple Output (MIMO) technology Practical network optimisation examples Service optimisation for UMTS and GPRS/EDGE capacity optimisation The ‘hot topic’ of service control and management in WCDMA and GPRS networks, that has evolved since the first edition Companion website includes: Figures Static radio network simulator implemented in MATLAB® This text will have instant appeal to wireless operators and network and terminal manufacturers. It will also be essential reading for undergraduate and postgraduate students, frequency regulation bodies and all those interested in radio network planning and optimisation, particularly RF network systems engineering professionals.

With the steady stream of new web based information technologies being introduced to organizations, the need for network and communication technologies to provide an easy integration of knowledge and information sharing is essential. Network and Communication Technology Innovations for Web and IT Advancement presents studies on

trends, developments, and methods on information technology advancements through network and communication technology. This collection brings together integrated approaches for communication technology and usage for web and IT advancements.

Provides a comprehensive and updated account of WDM optical network systems Optical networking has advanced considerably since 2010. A host of new technologies and applications has brought a significant change in optical networks, migrating it towards an all-optical network. This book places great emphasis on the network concepts, technology, and methodologies that will stand the test of time and also help in understanding and developing advanced optical network systems. The first part of *Optical WDM Networks: From Static to Elastic Networks* provides a qualitative foundation for what follows—presenting an overview of optical networking, the different network architectures, basic concepts, and a high-level view of the different network structures considered in subsequent chapters. It offers a survey of enabling technologies and the hardware devices in the physical layer, followed by a more detailed picture of the network in the remaining chapters. The next sections give an in-depth study of the three basic network structures: the static broadcast networks, wavelength routed networks, and the electronic/optical logically routed networks, covering the characteristics of the optical networks in the access, metropolitan area, and long-haul reach. It discusses the networking picture; network control and management, impairment management and survivability. The last section of the book covers the upcoming technologies of flex-grid and software defined optical networking. Provides concise, updated, and comprehensive coverage of WDM optical networks Features numerous examples and exercise problems for the student to practice Covers, in detail, important topics, such as, access, local area, metropolitan, wide area all-optical and elastic networks Includes protocols, design, and analysis along with the control and management of the networks Offers exclusive chapters on advance topics to cover the present and future technological trends, such as, software defined optical networking and the flexible grid optical networks *Optical WDM Networks: From Static to Elastic Networks* is an excellent book for under and post graduate students in electrical/communication engineering. It will also be very useful to practicing professionals in communications, networking, and optical systems.

Information and its Role in Hunter-Gatherer Bands explores the question of how information, broadly conceived, is acquired, stored, circulated, and utilized in small-scale hunter-gatherer societies, or bands. Given the nature of this question, the volume brings together a group of scholars from multiple disciplines, including archaeology, ethnography, linguistics, and evolutionary ecology. Each of these specialties deals with the question of information in different ways and with different sets of data given different primacy. The fundamental goal of the volume is to bridge disciplines and subdisciplines, open discussion, and see if some common ground—either theoretical perspectives, general principles, or methodologies—can be developed upon which to build future research on the role of information in hunter-gatherer bands. With transfer speeds up to 11 Mbps the 802.11 wireless network standard is set to revolutionize wireless LANs. Matthew Gast's definitive guide to the standard is aimed at administrators, architects and security professionals.

This book constitutes the refereed proceedings of the 18th International Conference on Engineering Applications of Neural Networks, EANN 2017, held in Athens, Greece, in August 2017. The 40 revised full papers and 5 revised short papers presented were carefully reviewed and selected from 83 submissions. The papers cover the topics of deep learning, convolutional neural networks, image processing, pattern recognition, recommendation systems, machine learning, and applications of Artificial Neural Networks (ANN) applications in engineering, 5G telecommunication networks, and audio signal processing. The volume also includes papers presented at the 6th Mining Humanistic Data Workshop (MHDW 2017) and the 2nd Workshop on 5G-Putting Intelligence to the Network Edge (5G-PINE).

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. New digital image processing and recognition methods, implementation techniques and advanced applications (television, remote sensing, biomedicine, traffic, inspection, robotics, etc.) are presented in this volume. Novel approaches (i.e. digital filters, source coding, neural networks etc.) for solving 2-D and 3-D problems are described. Many papers focus on the motion estimation and tracking recognition of moving objects. The increasingly important field of Cultural Heritage is also covered. Some papers are more theoretical or of review nature, while others contain new implementations and applications. Generally the book presents - for the above outlined area - the state of the art (theory, implementation, applications) with future trends. This book will be of interest not only to researchers, professors and

students in university departments of engineering, communications, computers and automatic control, but also to engineers and managers of industries concerned with computer vision, manufacturing, automation, robotics and quality control.

An ideal starting point for anyone wanting to learn about nextgeneration wireless networks Gives important insights into the design of wireless IPnetworks Illustrates the standards and network architectures defined byleading standards bodies (including MWIF, 3GPP and 3GPP2) Discusses protocols in four key areas: signaling, mobility,quality of service, and security The authors have a good deal of experience in this field, andhave many patents pending in the area of wireless networking

The first and only up-to-date guide offering complete coverage of HetNets—written by top researchers and engineers in the field Small Cell Networks: Deployment, Management, and Optimization addresses key problems of the cellular network evolution towards HetNets. It focuses on the latest developments in heterogeneous and small cell networks, as well as their deployment, operation, and maintenance. It also covers the full spectrum of the topic, from academic, research, and business to the practice of HetNets in a coherent manner. Additionally, it provides complete and practical guidelines to vendors and operators interested in deploying small cells. The first comprehensive book written by well-known researchers and engineers from Nokia Bell Labs, Small Cell Networks begins with an introduction to the subject—offering chapters on capacity scaling and key requirements of future networks. It then moves on to sections on coverage and capacity optimization, and interference management. From there, the book covers mobility management, energy efficiency, and small cell deployment, ending with a section devoted to future trends and applications. The book also contains: The latest review of research outcomes on HetNets based on both theoretical analyses and network simulations Over 200 sources from 3GPP, the Small Cell Forum, journals and conference proceedings, and all prominent topics in HetNet An overview of indoor coverage techniques such as metrocells, picocells and femtocells, and their deployment and optimization Real case studies as well as innovative research results based on both simulation and measurements Detailed information on simulating heterogeneous networks as used in the examples throughout the book Given the importance of HetNets for future wireless communications, Small Cell Networks: Deployment, Management, and Optimization is sure to help decision makers as they consider the migration of services to HetNets. It will also appeal to anyone involved in information and communication technology.

This book allows readers to gain an in-depth understanding of resource allocation problems in wireless networks and the techniques used to solve them.

Written in a unique style, this book is a valuable resource for faculty, graduate students, and researchers in the communications and networking area whose work interfaces with optimization. It teaches you how various optimization methods can be applied to solve complex problems in wireless networks. Each chapter reviews a specific optimization method and then demonstrates how to apply the theory in practice through a detailed case study taken from state-of-the-art research. You will learn various tips and step-by-step instructions for developing optimization models, reformulations, and transformations, particularly in the context of cross-layer optimization problems in wireless networks involving flow routing (network layer), scheduling (link layer), and power control (physical layer). Throughout, a combination of techniques from both operations research and computer science disciplines provides a holistic treatment of optimization methods and their applications. Each chapter includes homework exercises, with PowerPoint slides and a solutions manual for instructors available online.

Shaping Future 6G Networks Discover the societal and technology drivers contributing to build the next generation of wireless telecommunication networks Shaping Future 6G Networks: Needs, Impacts, and Technologies is a holistic snapshot on the evolution of 5G technologies towards 6G. With contributions from international key players in industry and academia, the book presents the hype versus the realistic capabilities of 6G technologies, and delivers cutting-edge business and technological insights into the future wireless telecommunications landscape. You'll learn about: Forthcoming demand for post 5G networks, including new requirements coming from small and large businesses, manufacturing, logistics, and automotive industry Societal implications of 6G, including digital sustainability, strategies for increasing energy efficiency, as well as future open networking ecosystems Impacts of integrating non-terrestrial networks to build the 6G architecture Opportunities for emerging THz radio access technologies in future integrated communications, positioning, and sensing capabilities in 6G Design of highly modular and distributed 6G core networks driven by the ongoing RAN-Core integration and the benefits of AI/ML-based control and management Disruptive architectural considerations influenced by the Post-Shannon Theory The insights in Shaping Future 6G Networks will greatly benefit IT engineers and managers focused on the future of networking, as well as undergraduate and graduate engineering students focusing on the design, implementation, and management of mobile networks and applications. Cooperative Cognitive Radio Networks: The Complete Spectrum Cycle provides a solid understanding of the foundations of cognitive radio technology, from spectrum sensing, access, and handoff to routing, trading, and security. Written in a tutorial style with several illustrative examples, this comprehensive book: Gives an overview of cognitive radio systems and explains the different components of the spectrum cycle Features step-by-step analyses of the different algorithms and systems, supported by extensive computer simulations, figures, tables, and references Fulfills the need for a single source of information on all aspects of the spectrum cycle, including the physical, link, medium access, network, and application layers Offering a unifying view of the various approaches and methodologies, Cooperative Cognitive Radio Networks: The Complete Spectrum Cycle presents the state of the art of cognitive radio technology, addressing all phases of the spectrum access cycle.

This authoritative book provides a thorough understanding of the fundamental concepts of satellite communications (SATCOM) network design and performance assessments. You find discussions on a wide class of SATCOM networks using satellites as core components, as well as coverage key applications in the field. This in-depth resource presents a broad range of critical topics, from geosynchronous Earth orbiting (GEO) satellites and direct broadcast satellite systems, to low Earth orbiting (LEO) satellites, radio standards and protocols. This invaluable reference explains the many specific uses of satellite networks, including small-terminal wireless and mobile communications systems. Moreover, this book presents advanced topics such as satellite RF link analyses, optimum transponder loading, on-board processing, antenna characteristics, protected systems, information assurance, and spread spectrums. You are introduced to current and future SATCOM systems and find details on their performance

supportabilities. This cutting-edge book also presents trends in multimedia satellite applications and IP services over satellites. A timely overview of a complete spectrum of technologies specifically designed for public safety communications as well as their deployment as management In our increasingly disaster-prone world, the need to upgrade and better coordinate our public safety networks combined with successful communications is more critical than ever. *Fundamentals of Public Safety Networks and Critical Communications Systems* fills a gap in the literature by providing a book that reviews a comprehensive set of technologies, from most popular to the most advanced communications technologies that can be applied to public safety networks and mission-critical communications systems. The book explores the technical and economic feasibility, design, application, and sustainable operation management of these vital networks and systems. Written by a noted expert in the field, the book provides extensive coverage of systems, services, end-user devices, and applications of public-safety services and technologies. The author explores the potential for advanced public safety systems, and this comprehensive text covers all aspects of the public safety and critical communications network field. This important book: Provides an introduction to and discussion of the common characteristics of our critical communications systems Presents a review of narrowband technologies such as Project 25, TETRA, and DMR as well as the broadband technologies such as the LTE technology Focuses on the emerging technologies that can be adopted to improve our vital communications systems Discusses deployment of such technologies, including economics and finance, planning and project management Provides, in detail, the issues and solutions related to the management of such communications networks Offers a complete list of standards documents Written for professionals in the industry, academics, and government and regulatory agencies, *Fundamentals of Public Safety Networks and Critical Communications Systems* offers a review of the most significant safety technologies, explores the application for advanced technologies, and examines the most current research. This book constitutes the refereed proceedings of the 11th International Conference on Ad Hoc Networks, ADHOCNETS 2019, held in Queenstown, New Zealand, in November 2019. The 28 full papers were selected from 64 submissions and cover a variety of network paradigms including mobile ad hoc networks, sensor networks, vehicular networks, underwater networks, airborne networks, underground networks, personal area networks, device-to-device (D2D) communications in 5G cellular networks, and home networks. The papers present a wide range of applications in civilian, commercial, and military areas.

Applied Optimization Methods for Wireless Networks Cambridge University Press

This book constitutes the thoroughly refereed post-conference proceedings of the 8th Pacific Rim Symposium on Image and Video Technology, PSIVT 2017, held in Wuhan, China, in November 2017. The total of 39 revised papers was carefully reviewed and selected from 91 submissions. The Pacific-Rim Symposium on Image and Video Technology (PSIVT) is a high-quality series of symposia that aim at providing a forum for researchers and practitioners who are being involved, or are contributing to theoretical advances or practical implementations in image and video technology.

Technological advances have helped to enhance disaster resilience through better risk reduction, response, mitigation, rehabilitation and reconstruction. In former times, it was local and traditional knowledge that was mainly relied upon for disaster risk reduction. Much of this local knowledge is still valid in today's world, even though possibly in different forms and contexts, and local knowledge remains a shared part of life within the communities. In contrast, with the advent of science and technology, scientists and engineers have become owners of advanced technologies, which have contributed significantly to reducing disaster risks across the globe. This book analyses emerging technologies and their effects in enhancing disaster resilience. It also evaluates the gaps, challenges, capacities required and the way forward for future disaster management. A wide variety of technologies are addressed, focusing specifically on new technologies such as cyber physical systems, geotechnology, drone, and virtual reality (VR)/ augmented reality (AR). Other sets of emerging advanced technologies including an early warning system and a decision support system are also reported on. Moreover, the book provides a variety of discussions regarding information management, communication, and community resilience at the time of a disaster. This book's coverage of different aspects of new technologies makes it a valuable resource for students, researchers, academics, policymakers, and development practitioners.

The Industrial Internet of Things (Industrial IoT—IIoT) has emerged as the core construct behind the various cyber-physical systems constituting a principal dimension of the fourth Industrial Revolution. While initially born as the concept behind specific industrial applications of generic IoT technologies, for the optimization of operational efficiency in automation and control, it quickly enabled the achievement of the total convergence of Operational (OT) and Information Technologies (IT). The IIoT has now surpassed the traditional borders of automation and control functions in the process and manufacturing industry, shifting towards a wider domain of functions and industries, embraced under the dominant global initiatives and architectural frameworks of Industry 4.0 (or Industrie 4.0) in Germany, Industrial Internet in the US, Society 5.0 in Japan, and Made-in-China 2025 in China. As real-time embedded systems are quickly achieving ubiquity in everyday life and in industrial environments, and many processes already depend on real-time cyber-physical systems and embedded sensors, the integration of IoT with cognitive computing and real-time data exchange is essential for real-time analytics and realization of digital twins in smart environments and services under the various frameworks' provisions. In this context, real-time sensor networks and systems for the Industrial IoT encompass multiple technologies and raise significant design, optimization, integration and exploitation challenges. The ten articles in this Special Issue describe advances in real-time sensor networks and systems that are significant enablers of the Industrial IoT paradigm. In the relevant landscape, the domain of wireless networking technologies is centrally positioned, as expected.

Optical communications networks are becoming increasingly important as there is demand for high capacity links. Dense wavelength division multiplexing (DWDM) is widely deployed at the core networks to accommodate high capacity transport systems. Optical components such as optical amplifiers, tunable filters, transceivers, termination devices and add-drop multiplexers are becoming more reliable and affordable. Access and metropolitan area networks are increasingly built with optical technologies to overcome the electronic bottleneck at network edges. New components and subsystems for very high speed optical networks offer new design options. The proceedings of the First International Conference on Optical Communications and Networks present high quality recent research results in the areas of optical

communications, network components, architectures, protocols, planning, design, management and operation. Today's wireless services have come a long way since the roll out of the conventional voice-centric cellular systems. The demand for wireless access in voice and high rate data multi-media applications has been increasing. New generation wireless communication systems are aimed at accommodating this demand through better resource management and improved transmission technologies. The interest in increasing Spectrum Access and improving Spectrum Efficiency combined with both the introduction of Software Defined Radios and the realization that machine learning can be applied to radios has created new intriguing possibilities for wireless radio researchers. This book is aimed to discuss the cognitive radio, software defined radio (SDR), and adaptive radio concepts from several aspects. Cognitive radio and cognitive networks will be investigated from a broad aspect of wireless communication system enhancement while giving special emphasis on better spectrum utilization. Applications of cognitive radio, SDR and cognitive radio architectures, spectrum efficiency and soft spectrum usage, adaptive wireless system design, measurements and awareness of various parameters including interference temperature and geo-location information are some of the important topics that will be covered in this book. Cognitive Radio, Software Defined Radio, and Adaptive Wireless Systems is intended to be both an introductory technology survey/tutorial for beginners and an advanced mathematical overview intended for technical professionals in the communications industry, technical managers, and researchers in both academia and industry. An Introduction to LTE explains the technology used by 3GPP Long Term Evolution. The book covers the whole of LTE, both the techniques used for radio communication between the base station and the mobile phone, and the techniques used for signalling communication and data transport in the evolved packet core. It avoids unnecessary detail, focussing instead on conveying a sound understanding of the entire system. The book is aimed at mobile telecommunication professionals, who want to understand what LTE is and how it works. It is invaluable for engineers who are working on LTE, notably those who are transferring from other technologies such as UMTS and cdma2000, those who are experts in one part of LTE but who want to understand the system as a whole, and those who are new to mobile telecommunications altogether. It is also relevant to those working in non technical roles, such as project managers, marketing executives and intellectual property consultants. On completing the book, the reader will have a clear understanding of LTE, and will be able to tackle the more specialised books and the 3GPP specifications with confidence. Key features - Covers the latest developments in release 10 of the 3GPP specifications, including the new capabilities of LTE-Advanced Includes references to individual sections of the 3GPP specifications, to help readers understand the principles of each topic before going to the specifications for more detailed information Requires no previous knowledge of mobile telecommunications, or of the mathematical techniques that LTE uses for radio transmission and reception

The two-volume set LNICST 236-237 constitutes the post-conference proceedings of the 12th EAI International Conference on Communications and Networking, ChinaCom 2017, held in Xi'an, China, in September 2017. The total of 112 contributions presented in these volumes are carefully reviewed and selected from 178 submissions. The papers are organized in topical sections on wireless communications and networking, satellite and space communications and networking, big data network track, multimedia communications and smart networking, signal processing and communications, network and information security, advances and trends of V2X networks.

Sensor networks have many interesting applications with great utility; however, their actual deployment and realization rely on continuous innovations and solutions to many challenging problems. Thus, sensor networks have recently attracted the attention of many researchers and practitioners. The compilation of the Handbook on Sensor Networks will meet the demand of the sensor network community for a comprehensive reference and summary of the current state of the area. The Handbook on Sensor Networks is a collection of approximately 40 chapters on sensor network theory and applications. The book spans a wide spectrum and includes topics in medium access control, routing, security and privacy, coverage and connectivity, modeling and simulations, multimedia, energy efficiency, localization and tracking, design and implementation, as well as sensor network applications.

This book constitutes the refereed proceedings of the 9th International Conference on Ad-Hoc, Mobile, and Wireless Networks, ADHOC-NOW 2010, held in Edmonton, Canada, in August 2010. The 16 revised full papers were carefully reviewed and selected from 43 submissions. The accepted papers cover topics in routing/broadcasting/multicasting protocols; energy efficiency; sensor coverage; scheduling algorithms; localization; mobility modeling; data collection and processing; and vehicular networks.

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