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KEY=AND - HERRING HAMMOND

LTE-Advanced Relay Technology and Standardization

Springer Science & Business Media [LTE-Advanced relay technology and standardization provides a timely reference work for relay technology with the finalizing of LTE Release 10 specifications. LTE-Advanced is quickly becoming the global standard for 4G cellular communications. The relay technology, as one of the key features in LTE-Advanced, helps not only to improve the system coverage and capacity, but also to save the costs of laying wireline backhaul. As a leading researcher in the field of LTE-Advanced standards, the author provides an in-depth description of LTE-A relay technology, and explains in detail the standard specification and design principles. Readers from both academic and industrial fields can find sections of interest to them: Sections 2 & 4 could benefit researchers in academia and those who are engaged in exploratory work, while Sections 3 & 4 are more useful to engineers. Dr. Yifei Yuan is the Technical Director at the Standards Department of ZTE Inc.](#)

Evaluation of Lte-Advanced Networks

LAP Lambert Academic Publishing [As a next-generation 3GPP standard, LTE-Advanced exclusively takes the relay technology into account. This book focuses the relay technologies for the LTE-Advanced systems and evaluates the performance of the relay-enhanced LTE-Advanced network. The approach for this work is to design several environments for LTE-Advanced networks involving relays. Incorporating the channel model from the Wireless World Initiative New Radio \(WINNER\) project, four environments were designed among which one environment considers no relay at all and the rest of the environments considered relay deployments. And the performances of all the environments are evaluated in terms of Symbol Error Rate \(SER\) versus the Signal to Noise Ratio \(SNR\), under several different scenarios defined in WINNER project. As an outcome, the simulation results from the simulator show that relay technologies can effectively improve service performance.](#)

4G: LTE/LTE-Advanced for Mobile Broadband

Academic Press [This book focuses on LTE with full updates including LTE-Advanced \(Release-11\) to provide a complete picture of the LTE system. Detailed explanations are given for the latest LTE standards for radio interface architecture, the physical layer, access procedures, broadcast, relaying, spectrum and RF characteristics, and system performance. Key technologies presented include multi-carrier transmission, advanced single-carrier transmission, advanced receivers, OFDM, MIMO and adaptive antenna solutions, radio resource management and protocols, and different radio network architectures. Their role and use in the context of mobile broadband access in general is explained, giving both a high-level overview and more detailed step-by-step explanations. This book is a must-have resource for engineers and other professionals in the telecommunications industry, working with cellular or wireless broadband technologies, giving an understanding of how to utilize the new technology in order to stay ahead of the competition. New to this edition: In-depth description of CoMP and enhanced multi-antenna transmission including new reference-signal structures and feedback mechanisms Detailed description of the support for heterogeneous deployments provided by the latest 3GPP release Detailed description of new enhanced downlink control-channel structure \(EPDDCH\) New RF configurations including operation in non-contiguous spectrum, multi-bands base stations and new frequency bands Overview of 5G as a set of well-integrated radio-access technologies, including support for higher frequency bands and flexible spectrum management, massive antenna configurations, and ultra-dense deployments Covers a complete update to the latest 3GPP Release-11 Two new chapters on HetNet, covering small cells/heterogeneous deployments, and CoMP, including Inter-site coordination Overview of current status of LTE release 12 including further enhancements of local-area, CoMP and multi-antenna transmission, Machine-type-communication, Device-to-device communication](#)

Advances in Information and Communication Technology and Systems

Springer Nature [This book highlights the most important research areas in Information and Communication Technologies as well as Radio Electronics, in particular contains publications on theory, applications, and design methods of Processing and Control in Information and Communication Systems. The respective chapters share in-depth and extended results in these areas with a view to resolving practically relevant and challenging issues including: 1. Infocommunications: IT, Cloud and Big Data technologies, E-society, Internet of Things and its implementation, Information and communication systems, security, etc.; 2. Telecommunications: Communication systems and networks, theoretical foundations of information processing and transmission in communication systems, SDN and SDR, etc.; 3. Radio Engineering: Theory of circuits, signals and processes in radio engineering and electronics, Circuit engineering, antennas, Microwave technology, Microwave and THz electronics, etc.; 4. Electronics: Electronic materials, Electronic devices, Nanoelectronics and Nanotechnology, etc. These results can be used in the implementation of novel systems and to promote the exchange of information in e-societies. Given its scope the book offers a valuable resource for scientists, lecturers, specialists working at enterprises, graduate and undergraduate students who engage with problems in Information and Communication Technologies as well as Radio Electronics](#)

LTE-Advanced Air Interface Technology

CRC Press [Opportunities are at hand for professionals eager to learn and apply the latest theories and practices in air interface technologies. Written by experienced researchers and professionals, LTE-Advanced Air Interface Technology thoroughly covers the performance targets and technology components studied by 3GPP for LTE-Advanced. Besides being an explanatory text about LTE-Advanced air interface technology, this book exploits the technical details in the 3GPP specification, and explains the motivation and implication behind the specifications. After a general description of wireless cellular technology evolution and the performance targets and major technical features of LTE-Advanced, LTE-Advanced Air Interface Technology discusses various innovative technical features in detail, including Innovative concepts in carrier aggregation techniques Collaborative multipoint \(CoMP\) theory and performance analysis Enhanced multiantenna solutions or multiple-input, multiple-output \(MIMO\) technology, in particular, multiuser and multilayer MIMO Relaying issues Self-organizing and heterogeneous networks Interference suppression and enhanced intercell interference coordination \(eICIC\) technology This book opens the door of LTE-A technology for practitioners in any stage of wireless communications. Beginning with basic communication principles, the book demonstrates how a complete wireless theory is built. Readers can work independently on original case studies and simulation programming examples, with an emphasis on technology and performance. Designed for professionals interested in gaining an upper hand, this book is the ideal educational and informative resource in the emerging field of air interface technology.](#)

Informatics Engineering and Information Science, Part III

International Conference, ICIEIS 2011, Kuala Lumpur, Malaysia, November 12-14, 2011. Proceedings

Springer Science & Business Media This 4-Volume-Set, CCIS 0251 - CCIS 0254, constitutes the refereed proceedings of the International Conference on Informatics Engineering and Information Science, ICIEIS 2011, held in Kuala Lumpur, Malaysia, in November 2011. The 210 revised full papers presented together with invited papers in the 4 volumes were carefully reviewed and selected from numerous submissions. The papers are organized in topical sections on e-learning, information security, software engineering, image processing, algorithms, artificial intelligence and soft computing, e-commerce, data mining, neural networks, social networks, grid computing, biometric technologies, networks, distributed and parallel computing, wireless networks, information and data management, web applications and software systems, multimedia, ad hoc networks, mobile computing, as well as miscellaneous topics in digital information and communications.

Public Safety Networks from LTE to 5G

John Wiley & Sons This timely book provides an overview of technologies for Public Safety Networks (PSNs). Including real-life examples of network application and services, it introduces readers to the many public safety network technologies and covers the historical developments as well as emerging trends in PSNs such as today's 4G and tomorrow's 5G cellular network related solutions. Public Safety Networks from LTE to 5G explores the gradual changes and transformation in the PSNs from the traditional approaches in communications, and examines the new technologies that have permeated this realm, as well as their advantages. It gives readers a look at the challenges public safety networks face by developing solutions for data rates such as introducing broadband data services into safer communication. Topics covered include: TETRA and TETRAPOL; Digital Mobile Radio (DMR), Next-Generation Digital Narrowband (NXDN), Digital Private Mobile Radio (dPMR); and Professional Digital Trunking (PDT). The book also presents information on FirstNet, ESN, and Safenet; Satellite Communications in EMS (Emergency Management) and Public Protection and Disaster Relief (PPDR); Wi-Fi in Ambulances; Technology in Patrol Communications; and more.

Wireless Public Safety Networks 2

A Systematic Approach

Elsevier Wireless Public Safety Networks, Volume Two: A Systematic Approach presents the latest advances in the wireless Public Safety Networks (PSNs) field, the networks established by authorities to either prepare the population for an eminent catastrophe, or those used for support during crisis and normalization phases. Maintaining communication capabilities in a disaster scenario is crucial for avoiding loss of lives and damages to property. This book examines past communication failures that have directly contributed to the loss of lives, giving readers in-depth discussions of the public networks that impact emergency management, covering social media, crowdsourcing techniques, wearable wireless sensors, moving-cells scenarios, mobility management protocols, 5G networks, broadband networks, data dissemination, and the resources of the frequency spectrum. Provides a focus on specific enabling technologies which can help the most on the deployment and usage of PSNs in real world scenarios Proposes a general framework that has the capability to fulfill the public safety requirements and dynamically adapt to different public safety situations Investigates the problem of data dissemination over PSNs, presenting a review of the state-of-the-art of different information and communication technologies

Modeling and Simulation of Computer Networks and Systems

Methodologies and Applications

Morgan Kaufmann Modeling and Simulation of Computer Networks and Systems: Methodologies and Applications introduces you to a broad array of modeling and simulation issues related to computer networks and systems. It focuses on the theories, tools, applications and uses of modeling and simulation in order to effectively optimize networks. It describes methodologies for modeling and simulation of new generations of wireless and mobiles networks and cloud and grid computing systems. Drawing upon years of practical experience and using numerous examples and illustrative applications recognized experts in both academia and industry, discuss: Important and emerging topics in computer networks and systems including but not limited to: modeling, simulation, analysis and security of wireless and mobiles networks especially as they relate to next generation wireless networks Methodologies, strategies and tools, and strategies needed to build computer networks and systems modeling and simulation from the bottom up Different network performance metrics including, mobility, congestion, quality of service, security and more... Modeling and Simulation of Computer Networks and Systems is a must have resource for network architects, engineers and researchers who want to gain insight into optimizing network performance through the use of modeling and simulation. Discusses important and emerging topics in computer networks and Systems including but not limited to: modeling, simulation, analysis and security of wireless and mobiles networks especially as they relate to next generation wireless networks Provides the necessary methodologies, strategies and tools needed to build computer networks and systems modeling and simulation from the bottom up Includes comprehensive review and evaluation of simulation tools and methodologies and different network performance metrics including mobility, congestion, quality of service, security and more

Cooperative Communications and Networking

Technologies and System Design

Springer Science & Business Media Cooperative and relay communications have recently become the most widely explored topics in communications, whereby users cooperate in transmitting their messages to the destination, instead of conventional networks which operate independently and compete among each other for channel resources. As the field has progressed, cooperative communications have become a design concept rather than a specific transmission technology. This concept has revolutionized the design of wireless networks, allowing increased coverage, throughput, and transmission reliability even as conventional transmission techniques gradually reach their limits. Cooperative and relay technologies have also made their way toward next generation wireless standards, such as IEEE802.16 (WiMAX) or LTE, and have been incorporated into many modern wireless applications, such as cognitive radio and secret communications. Cooperative Communications and Networking: Technologies and System Design provides a systematic introduction to the fundamental concepts of cooperative communications and relays technology to enable engineers, researchers or graduate students to conduct advanced research and development in this area. Cooperative Communications and Networking: Technologies and System Design provides researchers, graduate students, and practical engineers with sufficient knowledge of both the background of cooperative communications and networking, and potential research directions.

LTE-A Cellular Networks

Multi-hop Relay for Coverage, Capacity and Performance Enhancement

Springer In this book, three different methods are presented to enhance the capacity and coverage area in LTE-A cellular networks. The scope involves the evaluation of the effect of the RN location in terms of capacity and the determination of the optimum location of the relay that provides maximum achievable data rate for users with limited interference at the cell boundaries. This book presents a new model to enhance both capacity and coverage area in LTE-A cellular network by determining the optimum location for the RN with limited interference. The new model is designed to enhance the capacity of the relay link by employing two antennas in RN. This design enables the relay link to absorb more users at cell edge regions. An algorithm called the Balance Power Algorithm (BPA) is developed to reduce MR power consumption. The book pertains to postgraduate students and researchers in

wireless & mobile communications.

Advanced Electrical and Electronics Engineering

Volume 2

Springer Science & Business Media 2010 First International Conference on Electrical and Electronics Engineering was held in Wuhan, China December 4-5. Advanced Electrical and Electronics Engineering book contains 72 revised and extended research articles written by prominent researchers participating in the conference. Topics covered include, Power Engineering, Telecommunication, Control engineering, Signal processing, Integrated circuit, Electronic amplifier, Nano-technologies, Circuits and networks, Microelectronics, Analog circuits, Digital circuits, Nonlinear circuits, Mixed-mode circuits, Circuits design, Sensors, CAD tools, DNA computing, Superconductivity circuits. Electrical and Electronics Engineering will offer the state of art of tremendous advances in Electrical and Electronics Engineering and also serve as an excellent reference work for researchers and graduate students working with/on Electrical and Electronics Engineering.

Energy Management in Wireless Cellular and Ad-hoc Networks

Springer This book investigates energy management approaches for energy efficient or energy-centric system design and architecture and presents end-to-end energy management in the recent heterogeneous-type wireless network medium. It also considers energy management in wireless sensor and mesh networks by exploiting energy efficient transmission techniques and protocols, and explores energy management in emerging applications, services and engineering to be facilitated with 5G networks such as WBANs, VANETS and Cognitive networks. A special focus of the book is on the examination of the energy management practices in emerging wireless cellular and ad hoc networks. Considering the broad scope of energy management in wireless cellular and ad hoc networks, this book is organized into six sections covering range of Energy efficient systems and architectures; Energy efficient transmission and techniques; Energy efficient applications and services.

Mobile Communications Handbook

CRC Press With 26 entirely new and 5 extensively revised chapters out of the total of 39, the Mobile Communications Handbook, Third Edition presents an in-depth and up-to-date overview of the full range of wireless and mobile technologies that we rely on every day. This includes, but is not limited to, everything from digital cellular mobile radio and evolving personal communication systems to wireless data and wireless networks. Illustrating the extraordinary evolution of wireless communications and networks in the last 15 years, this book is divided into five sections: Basic Principles provides the essential underpinnings for the wide-ranging mobile communication technologies currently in use throughout the world. Wireless Standards contains technical details of the standards we use every day, as well as insights into their development. Source Compression and Quality Assessment covers the compression techniques used to represent voice and video for transmission over mobile communications systems as well as how the delivered voice and video quality are assessed. Wireless Networks examines the wide range of current and developing wireless networks and wireless methodologies. Emerging Applications explores newly developed areas of vehicular communications and 60 GHz wireless communications. Written by experts from industry and academia, this book provides a succinct overview of each topic, quickly bringing the reader up to date, but with sufficient detail and references to enable deeper investigations. Providing much more than a "just the facts" presentation, contributors use their experience in the field to provide insights into how each topic has emerged and to point toward forthcoming developments in mobile communications.

Cooperative Cellular Wireless Networks

Cambridge University Press A self-contained guide to the state-of-the-art in cooperative communications and networking techniques for next generation cellular wireless systems, this comprehensive book provides a succinct understanding of the theory, fundamentals and techniques involved in achieving efficient cooperative wireless communications in cellular wireless networks. It consolidates the essential information, addressing both theoretical and practical aspects of cooperative communications and networking in the context of cellular design. This one-stop resource covers the basics of cooperative communications techniques for cellular systems, advanced transceiver design, relay-based cellular networks, and game-theoretic and micro-economic models for protocol design in cooperative cellular wireless networks. Details of ongoing standardization activities are also included. With contributions from experts in the field divided into five distinct sections, this easy-to-follow book delivers the background needed to develop and implement cooperative mechanisms for cellular wireless networks.

Designing for Network and Service Continuity in Wireless Mesh Networks

Springer Science & Business Media "Designing for Network and Service Continuity in Wireless Mesh Networks" describes performance predictability of the new wireless mesh network paradigm, and describes considerations in designing networks from the perspective of survivability and service continuity metrics. The work provides design insights for network design researchers and industry professionals. It includes designs for new mesh networks and extensions of existing networks with predictable performance.

Ofdm Based Relay Systems for Future Wireless Communications

CRC Press Relay systems have become a subject of intensive research interest over the recent years, as it is recognized that they can improve performances and extend the coverage area of wireless communication systems. Special attention has been dedicated to them since the proposal appeared for their implementation in mobile cellular systems. Numerous researches conducted after that proposal have enabled incorporation of OFDM based relay systems in both accepted standards for IMT-Advanced systems. Nowadays, researches are ongoing with the aim to define new solutions for performance improvement of the standardized OFDM relay systems for cellular networks and one of the interesting solutions is implementation of subcarrier permutation (SCP) at the relay (R) station. The book OFDM based relay systems for future wireless communications presents a comprehensive research results in analyzing behavior and performance of the OFDM based relay systems with SCP. Dual-hop relay scenario with three communication terminals, and no direct link between the source (S) and the destination (D) has been analyzed, as it is compliant with the accepted solutions for IMT-Advanced systems. The book includes performance analysis and performance comparison of OFDM based: • amplify-and-forward (AF) relay systems with fixed gain (FG), • amplify-and-forward (AF) relay systems with variable gain (VG), • decode-and-forward (DF) relay systems, each including two SCP schemes, known to maximize the system capacity and/or improve the bit error rate (BER) performances. Performance comparisons have enabled definition of optimal solutions for the future wireless communication systems in a given conditions, and for the given optimality criteria. OFDM based relay systems for future wireless communications contains recent research results in this area and is ideal for the academic staff and master/research students in area of mobile communication systems, as well as for the personnel in communication industry.

Advances on Computational Intelligence in Energy

The Applications of Nature-Inspired Metaheuristic Algorithms in Energy

Springer Addressing the applications of computational intelligence algorithms in energy, this book presents a systematic procedure that illustrates the practical steps required for applying bio-inspired, meta-heuristic algorithms in energy, such as the prediction of oil consumption and other energy products. Contributions include research findings, projects, surveying work and industrial experiences that describe significant advances in the applications of computational intelligence algorithms in energy. For easy understanding, the text provides practical simulation results, convergence and learning curves as well as illustrations and tables. Providing a valuable resource for undergraduate and postgraduate students alike, it is also intended for researchers in the fields of computational intelligence and energy.

Networks of the Future Architectures, Technologies, and Implementations

CRC Press With the ubiquitous diffusion of the IoT, Cloud Computing, 5G and other evolved wireless technologies into our daily lives, the world will see the Internet of the future expand ever more quickly. Driving the progress of communications and connectivity are mobile and wireless technologies, including traditional WLANs technologies and low, ultra-power, short and long-range technologies. These technologies facilitate the communication among the growing number of connected devices, leading to the generation of huge volumes of data. Processing and analysis of such "big data" brings about many opportunities, as well as many challenges, such as those relating to efficient power consumptions, security, privacy, management, and quality of service. This book is about the technologies, opportunities and challenges that can drive and shape the networks of the future. Written by established international researchers and experts, Networks of the Future answers fundamental and pressing research challenges in the field, including architectural shifts, concepts, mitigation solutions and techniques, and key technologies in the areas of networking. The book starts with a discussion on Cognitive Radio (CR) technologies as promising solutions for improving spectrum utilization, and also highlights the advances in CR spectrum sensing techniques and resource management methods. The second part of the book presents the latest developments and research in the areas of 5G technologies and Software Defined Networks (SDN). Solutions to the most pressing challenges facing the adoption of 5G technologies are also covered, and the new paradigm known as Fog Computing is examined in the context of 5G networks. The focus next shifts to efficient solutions for future heterogeneous networks. It consists of a collection of chapters that discuss self-healing solutions, dealing with Network Virtualization, QoS in heterogeneous networks, and energy efficient techniques for Passive Optical Networks and Wireless Sensor Networks. Finally, the areas of IoT and Big Data are discussed, including the latest developments and future perspectives of Big Data and the IoT paradigms.

Mobile Ad Hoc Networking

Cutting Edge Directions

John Wiley & Sons "An excellent book for those who are interested in learning the current status of research and development . . . [and] who want to get a comprehensive overview of the current state-of-the-art." —E-Streams This book provides up-to-date information on research and development in the rapidly growing area of networks based on the multihop ad hoc networking paradigm. It reviews all classes of networks that have successfully adopted this paradigm, pointing out how they penetrated the mass market and sparked breakthrough research. Covering both physical issues and applications, Mobile Ad Hoc Networking: Cutting Edge Directions offers useful tools for professionals and researchers in diverse areas wishing to learn about the latest trends in sensor, actuator, and robot networking, mesh networks, delay tolerant and opportunistic networking, and vehicular networks. Chapter coverage includes: Multihop ad hoc networking Enabling technologies and standards for mobile multihop wireless networking Resource optimization in multiradio multichannel wireless mesh networks QoS in mesh networks Routing and data dissemination in opportunistic networks Task farming in crowd computing Mobility models, topology, and simulations in VANET MAC protocols for VANET Wireless sensor networks with energy harvesting nodes Robot-assisted wireless sensor networks: recent applications and future challenges Advances in underwater acoustic networking Security in wireless ad hoc networks Mobile Ad Hoc Networking will appeal to researchers, developers, and students interested in computer science, electrical engineering, and telecommunications.

Internet of Things: Novel Advances and Envisioned Applications

Springer This book focuses on a combination of theoretical advances in the Internet of Things, cloud computing and its real-life applications to serve society. The book discusses technological innovations, authentication, mobility support and security, group rekeying schemes and a range of concrete applications. The Internet has restructured not only global interrelations, but also an unbelievable number of personal characteristics. Machines are increasingly able to control innumerable autonomous gadgets via the Internet, creating the Internet of Things, which facilitates intelligent communication between humans and things, and among things. The Internet of Things is an active area of current research, and technological advances have been supported by real-life applications to establish their soundness. The material in this book includes concepts, figures, graphs, and tables to guide researchers through the Internet of Things and its applications for society.

AeroMACS

An IEEE 802.16 Standard-Based Technology for the Next Generation of Air Transportation Systems

John Wiley & Sons This is a pioneering textbook on the comprehensive description of AeroMACS technology. It also presents the process of developing a new technology based on an established standard, in this case IEEE 802.16 standards suite. The text introduces readers to the field of airport surface communications systems and provides them with comprehensive coverage of one of the key components of the Next Generation Air Transportation System (NextGen); i.e., AeroMACS. It begins with a critical review of the legacy aeronautical communications system and a discussion of the impetus behind its replacement with network-centric digital technologies. It then describes wireless mobile channel characteristics in general, and focuses on the airport surface channel over the 5GHz band. This is followed by an extensive coverage of major features of IEEE 802.16-2009 Physical Layer (PHY) and Medium Access Control (MAC) Sublayer. The text then provides a comprehensive coverage of the AeroMACS standardization process, from technology selection to network deployment. AeroMACS is then explored as a short-range high-data-throughput broadband wireless communications system, with concentration on the AeroMACS PHY layer and MAC sublayer main features, followed by making a strong case in favor of the IEEE 802.16j Amendment as the foundational standard for AeroMACS networks. AeroMACS: An IEEE 802.16 Standard-Based Technology for the Next Generation of Air Transportation Systems covers topics such as Orthogonal Frequency Division Multiple Access (OFDMA), coded OFDMA, scalable OFDMA, Adaptive Modulation-Coding (AMC), Multiple-Input Multiple-Output (MIMO) systems, Error Control Coding (ECC) and Automatic Repeat Request (ARQ) techniques, Time Division Duplexing (TDD), Inter-Application Interference (IAI), and so on. It also looks at future trends and developments of AeroMACS networks as they are deployed across the world, focusing on concepts that may be applied to improve the future capacity. In addition, this text: Discusses the challenges posed by complexities of airport radio channels as well as those pertaining to broadband transmissions Examines physical layer (PHY) and Media Access Control (MAC) sublayer protocols and signal processing techniques of AeroMACS inherited from IEEE 802.16 standard and WiMAX networks Compares AeroMACS and how it relates to IEEE 802.16 Standard-Based WiMAX AeroMACS: An IEEE 802.16 Standard-Based Technology for the Next Generation of Air Transportation Systems will appeal to engineers and technical professionals involved in the research and development of AeroMACS, technical staffs of government agencies in aviation sectors, and graduate students interested in standard-based wireless networking analysis, design, and development.

Future Information Technology

Springer Science & Business The new multimedia standards (for example, MPEG-21) facilitate the seamless integration of multiple modalities into interoperable multimedia frameworks, transforming the way people work and interact with multimedia data. These key technologies and multimedia solutions interact and collaborate with each other in increasingly effective ways, contributing to the multimedia revolution and having a significant impact across a wide spectrum of consumer, business, healthcare, education and governmental domains. This book aims to provide a complete coverage of the areas outlined and to bring together the researchers from academic and industry as well as practitioners to share ideas, challenges and solutions relating to the multifaceted aspects of this field.

Key Technologies for 5G Wireless Systems

Cambridge University Press Gain a detailed understanding of the protocols, network architectures and techniques being considered for 5G wireless networks with this authoritative guide to the state of the art. • Get up to speed with key topics such as cloud radio access networks, mobile edge computing, full duplexing, massive MIMO, mmWave, NOMA, Internet of things, M2M communications, D2D communications, mobile data offloading, interference mitigation techniques, radio resource management, visible light communications, and smart data pricing. • Learn from leading researchers in

academia and industry about the most recent theoretical developments in the field. • Discover how each potential technology can increase the capacity, spectral efficiency, and energy efficiency of wireless systems. Providing the most comprehensive overview of 5G technologies to date, this is an essential reference for researchers, practicing engineers and graduate students working in wireless communications and networking.

Recent Advances in Cellular D2D Communications

MDPI This book is a printed edition of the Special Issue "Recent Advances in Cellular D2D Communications" that was published in Future Internet

Cooperative Communications

Hardware, Channel and PHY

John Wiley & Sons Facilitating Cooperation for Wireless Systems Cooperative Communications: Hardware, Channel & PHY focuses on issues pertaining to the PHY layer of wireless communication networks, offering a rigorous taxonomy of this dispersed field, along with a range of application scenarios for cooperative and distributed schemes, demonstrating how these techniques can be employed. The authors discuss hardware, complexity and power consumption issues, which are vital for understanding what can be realized at the PHY layer, showing how wireless channel models differ from more traditional models, and highlighting the reliance of PHY algorithm performance on the underlying channel models. Numerous transparent and regenerative relaying protocols are described in detail for a variety of transparent and regenerative cooperative schemes. Key Features: Introduces background, concepts, applications, milestones and thorough taxonomy Identifies the potential in this emerging technology applied to e.g. LTE/WiMAX, WSN Discusses latest wireless channel models for transparent and regenerative protocols Addresses the fundamentals as well as latest emerging PHY protocols Introduces transparent distributed STBC, STTC, multiplexing and beamforming protocols Quantifies regenerative distributed space-time, channel and network coding protocols Explores system optimization, such as distributed power allocation and relay selection Introduces and compares analog and digital hardware architectures Quantifies complexity, memory and power consumption of 3G UMTS & 4G LTE/WiMAX relay Highlights future research challenges within the cooperative communications field This book is an invaluable guide for professionals and researchers in communications fields. It will also be of interest to graduates of communications and electronic engineering courses. It forms part of an entire series dedicated to cooperative wireless systems.

Novel 3D Media Technologies

Springer This book describes recent innovations in 3D media and technologies, with coverage of 3D media capturing, processing, encoding, and adaptation, networking aspects for 3D Media, and quality of user experience (QoE). The contributions are based on the results of the FP7 European Project ROMEO, which focuses on new methods for the compression and delivery of 3D multi-view video and spatial audio, as well as the optimization of networking and compression jointly across the future Internet. The delivery of 3D media to individual users remains a highly challenging problem due to the large amount of data involved, diverse network characteristics and user terminal requirements, as well as the user's context such as their preferences and location. As the number of visual views increases, current systems will struggle to meet the demanding requirements in terms of delivery of consistent video quality to fixed and mobile users. ROMEO will present hybrid networking solutions that combine the DVB-T2 and DVB-NGH broadcast access network technologies together with a QoE aware Peer-to-Peer (P2P) distribution system that operates over wired and wireless links. Live streaming 3D media needs to be received by collaborating users at the same time or with imperceptible delay to enable them to watch together while exchanging comments as if they were all in the same location. This book is the second of a series of three annual volumes devoted to the latest results of the FP7 European Project ROMEO. The present volume provides state-of-the-art information on immersive media, 3D multi-view video, spatial audio, cloud-based media, networking protocols for 3D media, P2P 3D media streaming, and 3D Media delivery across heterogeneous wireless networks among other topics. Graduate students and professionals in electrical engineering and computer science with an interest in 3D Future Internet Media will find this volume to be essential reading. Describes the latest innovations in 3D technologies and Future Internet Media Focuses on research to facilitate application scenarios such as social TV and high-quality, real-time collaboration Discusses QoE for 3D Represents the last of a series of three volumes devoted to contributions from FP7 projects in the area of 3D and networked media

LTE-Advanced

A Practical Systems Approach to Understanding 3GPP LTE Releases 10 and 11 Radio Access Technologies

Academic Press This book is an in-depth, systematic and structured technical reference on 3GPP's LTE-Advanced (Releases 10 and 11), covering theory, technology and implementation, written by an author who has been involved in the inception and development of these technologies for over 20 years. The book not only describes the operation of individual components, but also shows how they fit into the overall system and operate from a systems perspective. Uniquely, this book gives in-depth information on upper protocol layers, implementation and deployment issues, and services, making it suitable for engineers who are implementing the technology into future products and services. Reflecting the author's 25 plus years of experience in signal processing and communication system design, this book is ideal for professional engineers, researchers, and graduate students working in cellular communication systems, radio air-interface technologies, cellular communications protocols, advanced radio access technologies for beyond 4G systems, and broadband cellular standards. An end-to-end description of LTE/LTE-Advanced technologies using a top-down systems approach, providing an in-depth understanding of how the overall system works Detailed algorithmic descriptions of the individual components' operation and inter-connection Strong emphasis on implementation and deployment scenarios, making this a very practical book An in-depth coverage of theoretical and practical aspects of LTE Releases 10 and 11 Clear and concise descriptions of the underlying principles and theoretical concepts to provide a better understanding of the operation of the system's components Covers all essential system functionalities, features, and their inter-connections based on a clear protocol structure, including detailed signal flow graphs and block diagrams Includes methodologies and results related to link-level and system-level evaluations of LTE-Advanced Provides understanding and insight into the advanced underlying technologies in LTE-Advanced up to and including Release 11: multi-antenna signal processing, OFDM, carrier aggregation, coordinated multi-point transmission and reception, eICIC, multi-radio coexistence, E-MBMS, positioning methods, real-time and non-real-time wireless multimedia applications

LTE-Advanced and Next Generation Wireless Networks

Channel Modelling and Propagation

John Wiley & Sons LTE- A and Next Generation Wireless Networks: Channel Modeling and Performance describes recent advances in propagation and channel modeling necessary for simulating next generation wireless systems. Due to the radio spectrum scarcity, two fundamental changes are anticipated compared to the current status. Firstly, the strict reservation of a specific band for a unique standard could evolve toward a priority policy allowing the co-existence of secondary users in a band allocated to a primary system. Secondly, a huge increase of the number of cells is expected by combining outdoor base stations with smaller cells such as pico/femto cells and relays. This evolution is accompanied with the emergence of cognitive radio that becomes a reality intermingled together with the development of self-organization capabilities and distributed cooperative behaviors. The book is divided into three parts: Part I addresses the fundamentals (e.g. technologies, channel modeling principles etc.) Part II addresses propagation and modeling discussing topics such as indoor propagation, outdoor propagation, etc. Part III explores system performance and applications (e.g. MIMO Over-the-air testing, electromagnetic safety, etc).

Mobile Lightweight Wireless Systems

Second International ICST Conference, Mobilight 2010, May 10-12, 2010, Barcelona, Spain, Revised Selected Papers

Springer Science & Business Media Following the success of the First MOBILIGHT 2009 in Athens, Greece, the Second International Conference on Mobile Lightweight Systems (MOBILIGHT) was held in Barcelona, Spain on May 10-12, 2010. It was not an easy decision to carry on organizing a scientific event on wireless communications, where competition is really enormous. This decision was motivated by discussion with many colleagues about the current unprecedented demand for lightweight, wireless communication devices with high usability and performance able to support added-value services in a highly mobile environment. Such devices follow the users everywhere they go (at work, at home, while travelling, in a classroom, etc.) and result in exciting research, development and business opportunities. Such scenarios clearly demand significant upgrades to the existing communication paradigm in terms of infrastructure, devices and services to support the "anytime, anywhere, any device" philosophy, providing novel and fast-evolving requirements and expectations on search and development in the field of information and communication technologies. The core issue is to support wireless users' desire for 24/7 network availability and transparent access to "their own" services. In this context, we continue to envision an international forum where practitioners and researchers coming from the many areas involved in lightweight wireless systems' design and deployment would be able to interact and exchange experiences.

Transmission Techniques for Emergent Multicast and Broadcast Systems

CRC Press Describing efficient transmission schemes for broadband wireless systems, Transmission Techniques for Emergent Multicast and Broadcast Systems examines advances in transmission techniques and receiver designs capable of supporting the emergent wireless needs for multimedia broadcast and multicast service (MBMS) requirements. It summarizes the research

Advanced Optical and Wireless Communications Systems

Springer Nature The new edition of this popular textbook keeps its structure, introducing the advanced topics of: (i) wireless communications, (ii) free-space optical (FSO) communications, (iii) indoor optical wireless (IR) communications, and (iv) fiber-optics communications, but thoroughly updates the content for new technologies and practical applications. The author presents fundamental concepts, such as propagation principles, modulation formats, channel coding, diversity principles, MIMO signal processing, multicarrier modulation, equalization, adaptive modulation and coding, detection principles, and software defined transmission, first describing them and then following up with a detailed look at each particular system. The book is self-contained and structured to provide straightforward guidance to readers looking to capture fundamentals and gain theoretical and practical knowledge about wireless communications, free-space optical communications, and fiber-optics communications, all which can be readily applied in studies, research, and practical applications. The textbook is intended for an upper undergraduate or graduate level courses in fiber-optics communication, wireless communication, and free-space optical communication problems, an appendix with all background material needed, and homework problems. In the second edition, in addition to the existing chapters being updated and problems being inserted, one new chapter has been added, related to the physical-layer security thus covering both security and reliability issues. New material on 5G and 6G technologies has been added in corresponding chapters.

Radio Protocols for LTE and LTE-Advanced

John Wiley & Sons Provides a unique focus on radio protocols for LTE and LTE-Advanced (LTE-A). Giving readers a valuable understanding of LTE radio protocols, this book covers LTE (Long-Term Evolution) Layer 2/3 radio protocols as well as new features including LTE-Advanced. It is divided into two sections to differentiate between the two technologies' characteristics. The authors systematically explain the design principles and functions of LTE radio protocols during the development of mobile handsets. The book also provides essential knowledge on the interaction between mobile networks and mobile handsets. Among the first publications based on the 3GPP R10 specifications, which introduces LTE-A. Beginning with an overview of LTE, topics covered include: Idle Mode Procedure; Packet Data Convergence Protocol and Public Warning Systems. Presents the LTE radio interface protocol layers in a readable manner, to enhance the material in the standards publications. From an expert author team who have been directly working on the 3GPP standards. It is targeted at professionals working or intending to work in the area and can also serve as supplementary reading material for students who need to know how theory on the most extensively used mobile radio interface today is put into practice.

4G, LTE-Advanced Pro and The Road to 5G

Academic Press The upcoming 5G specifications from 3GPP, to be available in 2018, will include LTE-Advanced Pro as well as a new 5G radio-access technology. This practical and very successful book, written by engineers working closely with 3GPP, gives insight into the newest technologies and standards adopted by 3GPP, with detailed explanations of the specific solutions chosen and their implementation in LTE, LTE-Advanced, and LTE-Advanced Pro, as well as providing a detailed description of the path to 5G and the associated underlying technologies. This edition has been thoroughly revised and updated to reflect the large extensions to LTE as introduced in 3GPP Releases 12 and 13 and the role of LTE in the upcoming 5G era. New to this edition includes updated content on: 4G and 5G Radio Access Spectrum for 4G and 5G Machine-Type Communication Device-to-Device Communication License-assisted Access Full-dimension MIMO Small-cell enhancements, eIMTA, FDD+TDD aggregation, dual connectivity Requirements on and general structure of 5G wireless access, addressing the existing and new usage scenarios for 5G. Technical solutions for the new 5G radio-access technology. The authors of this book all work at Ericsson Research and have been deeply involved in 3G and 4G development and standardization. They are leading experts in the field and are today actively contributing to the standardization of 4G and 5G within 3GPP. The leading book on 3GPP specifications for LTE, LTE-Advanced, and LTE-Advanced Pro covering up to and including Release 13, written by Ericsson engineers who are heavily involved in the development of 3GPP specifications. Ten new chapters and coverage of all major features introduced with Release 12 and 13. Two completely new chapters on 5G wireless access including a detailed description of the key technology components under development by 3GPP.

5G Spectrum and Standards

Artech House This new resource provides key insight into future 5G radio systems and the technical and economic impact on industries, communities and end-users. The book offers a comprehensive understanding of the options available for teams tasked with bringing 5G products and services to market or developing supporting standards and regulatory frameworks. Readers find contemporary examples of millimeter band radio hardware including 60 GHz and V band and E Band point to point radio. This book demonstrates the profound progress with 4G radio signal processing and RF hardware to reveal its potential applicability to 5G radio systems. It shows how 5G systems are capable of delivering data rates that are ten to one hundred times faster than 4G systems. Developments in spatial processing and beam forming in local area radio networks are presented and the challenge of scaling these systems to wide area radio is explored. This book reviews military and space radio and automotive radar innovation with direct relevance to 5G radio design.

Future Information Technology

6th International Conference on Future Information Technology, FutureTech 2011, Crete, Greece, June 28-30, 2011. Proceedings

Springer Science & Business Media This two-volume-set constitutes the refereed proceedings of the 6th International Conference on Future Information Technology, FutureTech 2011, held in Crete, Greece, in June 2011. The 123 revised full papers presented in both volumes were carefully reviewed and selected from numerous submissions. The papers are organized in topical sections on future information technology, IT service and cloud computing; social computing, network, and services; forensics for future generation communication environments; intelligent transportation systems and applications; multimedia and semantic technologies; information science and technology.

Computational Science and Its Applications -- ICCSA 2013

13th International Conference, ICCSA 2013, Ho Chi Minh City, Vietnam, June 24-27, 2013, Proceedings, Part V

Springer The five-volume set LNCS 7971-7975 constitutes the refereed proceedings of the 13th International Conference on Computational Science and Its Applications, ICCSA 2013, held in Ho Chi Minh City, Vietnam in June 2013. The 248 revised papers presented in five tracks and 33 special sessions and workshops were carefully reviewed and selected. The 46 papers included in the five general tracks are organized in the following topical sections: computational methods, algorithms and scientific applications; high-performance computing and networks; geometric modeling, graphics and visualization; advanced and emerging applications; and information systems and technologies. The 202 papers presented in special sessions and workshops cover a wide range of topics in computational sciences ranging from computational science technologies to specific areas of computational sciences such as computer graphics and virtual reality.

IT Convergence and Security 2012

Springer Science & Business Media The proceedings approaches the subject matter with problems in technical convergence and convergences of security technology. This approach is new because we look at new issues that arise from techniques converging. The general scope of the proceedings content is convergence security and the latest information technology. The intended readership are societies, enterprises, and research institutes, and intended content level is mid- to highly educated personals. The most important features and benefits of the proceedings are the introduction of the most recent information technology and its related ideas, applications and problems related to technology convergence, and its case studies and finally an introduction of converging existing security techniques through convergence security. Overall, through the proceedings, authors will be able to understand the most state of the art information strategies and technologies of convergence security.

LTE Advanced

3GPP Solution for IMT-Advanced

John Wiley & Sons From the editors of the highly successful LTE for UMTS: Evolution to LTE-Advanced, this new book examines the main technical enhancements brought by LTE-Advanced, thoroughly covering 3GPP Release 10 specifications and the main items in Release 11. Using illustrations, graphs and real-life scenarios, the authors systematically lead readers through this cutting-edge topic to provide an outlook on existing technologies as well as possible future developments. The book is structured to follow the main technical areas that will be enhanced by the LTE-Advanced specifications. The main topics covered include: Carrier Aggregation; Multi-antenna MIMO Transmission, Heterogeneous Networks; Coordinated Multipoint Transmission (CoMP); Relay nodes; 3GPP milestones and IMT-Advanced process in ITU-R; and LTE-Advanced Performance Evaluation. Key features: Leading author and editor team bring their expertise to the next generation of LTE technology. Includes tables, figures and plots illustrating the concepts or simulation results, to aid understanding of the topic, and enabling readers to be ahead of the technological advances.

Cable and Wireless Networks

Theory and Practice

CRC Press Cable and Wireless Networks: Theory and Practice presents a comprehensive approach to networking, cable and wireless communications, and networking security. It describes the most important state-of-the-art fundamentals and system details in the field, as well as many key aspects concerning the development and understanding of current and emergent services. In this book, the author gathers in a single volume current and emergent cable and wireless network services and technologies. Unlike other books, which cover each one of these topics independently without establishing their natural relationships, this book allows students to quickly learn and improve their mastering of the covered topics with a deeper understanding of their interconnection. It also collects in a single source the latest developments in the area, typically only within reach of an active researcher. Each chapter illustrates the theory of cable and wireless communications with relevant examples, hands-on exercises, and review questions suitable for readers with a BSc degree or an MSc degree in computer science or electrical engineering. This approach makes the book well suited for higher education students in courses such as networking, telecommunications, mobile communications, and network security. This is an excellent reference book for academic, institutional, and industrial professionals with technical responsibilities in planning, design and development of networks, telecommunications and security systems, and mobile communications, as well as for Cisco CCNA and CCNP exam preparation.