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5G MOBILE COMMUNICATIONS

Smart Phone and Next Generation Mobile Computing

Mobile Design and Development

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Evolution and Standardization of Mobile Communications Technology IGI Global

5G is the upcoming generation of the wireless network that will be the advanced version of 4G LTE+ providing all the features of a 4G LTE network and connectivity for IoT devices with faster speed and lower latency. The 5G network is going to be a service-oriented network, connecting billions of IoT devices and mobile phones through the wireless network, and hence, it needs a special emphasis on security. Security is the necessary enabler for the continuity of the wireless network business, and in 5G, network security for IoT devices is the most important aspect. As IoT is gaining momentum, people can remotely operate or instruct their network devices. Therefore, there is a need for robust security mechanisms to prevent unauthorized access to the devices. Evolution of Software-Defined Networking Foundations for IoT and 5G Mobile Networks is a collection of innovative research on the security challenges and prevention mechanisms in high-speed mobile networks. The book explores the threats to 5G and IoT and how to implement effective security architecture for them. While highlighting topics including artificial intelligence, mobile technology, and ubiquitous computing, this book is ideally designed for cybersecurity experts, network providers, computer scientists, communication technologies experts, academicians, students, and researchers.

Wireless Network Evolution CRC Press

5G mobile networks use new concepts and technologies to provide current and future applications from high bit-rate smartphones to highly available Car-to-X and IoT applications. But not only technology is an issue. Also, the environmental impact is under discussion. These topics are presented here in a well-founded introduction, with the focus on innovative concepts and technologies, including standardization.

4G: LTE/LTE-Advanced for Mobile Broadband CRC Press

This book deals with the development of so-called fourth generation mobile communications or 4G. It covers all aspects of the technology in a form comprehensible to the general reader, a history of its implementation on a worldwide basis and information on how it will be used to improve business transactions. It is up-to-date, comprehensive, and is based upon information acquired from well over one thousand individual sources. All of the data are set up in a manner that simplifies comparisons between countries and service providers. Based on the extensive analysis of the different contexts and progress of 4G technology, future prospects for high-speed mobile communications are also presented.

Rolling Out 5G John Wiley & Sons

Starting from voice services with simple terminals, a mobile device today is nothing short of a small PC in the form of smart-phones. The result has been a huge increase in data-services, giving mobile communication access to critical aspects of human life. This has led to the standardization of System Architecture Evolution/Long Term Evolution (SAE/LTE) by 3GPP and IEEE 802.16e / WiMAX. Together with penetration of mobile

communications and new standardization come new security issues and, thus, the need for new security solutions. Security in Next Generation Mobile Networks provides a fresh look at those security aspects with the main focus on the latest security developments in 3GPP SAE/LTE and WiMAX. SAE/LTE is also known as Evolved Packet System (EPS). This book includes six chapters, the first three serving as introductory text, and the remaining three providing more in-depth discussions. Chapter One gives a background of Next Generation Mobile Networks (NGMN) activity and requirements. Following this explanation, Chapter Two provides an overview of security, telecommunication systems, and their requirements, and Chapter Three provides some background on standardization. Chapter Four discusses the EPS (or SAE/LTE) security architecture developed by 3GPP. In particular, this chapter covers the authentication and key agreement method for SAE/LTE together with newly defined key hierarchy. This chapter also addresses the challenging aspects of SAE/LTE interworking and mobility with UMTS together with the necessary key-exchange technologies. Chapter Five provides an in-depth discussion of the WiMAX security requirements, the authentication aspects of PKMv2, and the overall WiMAX network security aspects. In Chapter Six, the text briefly covers security for: -Home(evolved)NodeB, which is the Femto solution from 3GPP -Machine-to-Machine (M2M) -Multimedia Broadcast and Multicast Service (MBMS) and Group Key Management. The intended audience for this book is mobile network and device architects, designers, researchers, and students. The goal of the authors, who have a combined experience of more than 25 years in mobile security standardization, architecture, research, and education, is to provide readers with a fresh, up-to-date look at the architecture and challenges of EPS and WiMAX security.

5G Multimedia Communication "O'Reilly Media, Inc."

This book will help readers comprehend technical and policy elements of telecommunication particularly in the context of 5G. It first presents an overview of the current research and standardization practices and lays down the global frequency spectrum allocation process. It further lists solutions to accommodate 5G spectrum requirements. The readers will find a considerable amount of information on 4G (LTE-Advanced), LTE-Advance Pro, 5G NR (New Radio); transport network technologies, 5G NGC (Next Generation Core), OSS (Operations Support Systems), network deployment and end-to-end 5G network architecture. Some details on multiple network elements (end products) such as 5G base station/small cells and the role of semiconductors in telecommunication are also provided. Keeping trends in mind, service delivery mechanisms along with state-of-the-art services such as MFS (mobile financial services), mHealth (mobile health) and IoT (Internet-of-Things) are covered at length. At the end, telecom sector's burning challenges and best practices are explained which may be looked into for today's and tomorrow's networks. The book concludes with certain high level suggestions for the growth of telecommunication, particularly on the importance of basic research, departure from ten-year evolution cycle and having a 20-30 year plan. Explains the conceivable six phases of mobile telecommunication's ecosystem that includes R&D, standardization, product/network/device & application development, and burning challenges and best practices Provides an overview of research and standardization on 5G Discusses solutions to address 5G spectrum requirements while describing the global frequency spectrum allocation process Presents various case studies and policies Provides details on multiple network elements and the role of semiconductors in telecommunication Presents service delivery mechanisms with special focus on IoT

Towards Cognitive Autonomous Networks CRC Press

This book presents a comprehensive overview of the latest technology developments in the field of Mobile Communications. It focuses on the fundamentals of mobile communications technology and systems, including the history and service evolution of mobile communications and environments. Further to this, CDMA technology including spread spectrum, orthogonal and PN codes are introduced. Other important aspects are included.

Green Mobile Networks John Wiley & Sons

This book sheds light on the cyber security challenges associated with nextgeneration computing technologies, emphasizing the serious threats posed to individuals, businesses, and nations. With everything becoming increasingly interconnected via the Internet, data security becomes paramount. As technology advances, people need to secure their data communication processes. Personal data security, including data integrity and confidentiality, is particularly vulnerable. Therefore, the concept of cyber security forensics emerges to ensure data security for everyone, addressing issues such as data control, hijacking, and threats to personal devices such as mobile phones, laptops, and other smart technologies. This book covers key topics related to cyber security in next-generation computing technologies, ultimately enhancing the quality of life for citizens, facilitating interaction with smart governments, and promoting secure communication processes. KEY FEATURES Highlights innovative principles and practices using next generation computing technologies based cybersecurity Presents an introduction to recent trends regarding the convergence of AI/ML in cybersecurity Offers an overview of theoretical, practical, simulation concepts of cybersecurity

Fundamentals of Network Planning and Optimisation 2G/3G/4G IGI Global

Explore mobile communications and discover how the technology has evolved to 5G This hands-on textbook lays out the foundations of mobile communications—from architecture to function—with a special focus on 5G services, networks, and applications. Written by a stellar team of academics and mobile networking practitioners, End-to-End Mobile Communications: Evolution to 5G clearly explains the latest capabilities, standards, and practices along with background and examples. The book contains a primer on the vast topic of mobile technology security and offers a look toward future trends and emerging technologies. Coverage includes: An introduction to mobile communications Background on mobile network services Evolution of mobile technologies 5G services and applications 5G radio access network architecture 5G core network architecture Security Future evolution of mobile systems

Fundamentals of LTE John Wiley & Sons

In response to a request from the Defense Advanced Research Projects Agency, the committee studied a range of issues to help identify what strategies the Department of Defense might follow to meet its need for flexible, rapidly deployable communications systems. Taking into account the military's particular requirements for security, interoperability, and other capabilities as well as the extent to which commercial technology development can be expected to support these and related needs, the book recommends systems and component research as well as organizational changes to help the DOD field state-of-the-art, cost-effective untethered communications systems. In addition to advising DARPA on where its

investment in information technology for mobile wireless communications systems can have the greatest impact, the book explores the evolution of wireless technology, the often fruitful synergy between commercial and military research and development efforts, and the technical challenges still to be overcome in making the dream of "anytime, anywhere" communications a reality.

The Changing World of Mobile Communications McGraw Hill Professional

The expected future evolution of mobile and wireless communication technologies will enable a whole new generation of mass-market-scale ubiquitous services and applications. The challenge now is to research and develop applications and services addressing the true needs of the end-users, and to provide engaging and sustaining added value to them. Enabling Technologies for Mobile Services takes a comprehensive approach on these challenges and provides practical guidelines on building new, innovative applications and services. It shares knowledge gained from a collaborative research project where the methods and technologies were applied and utilised. This book is ideal for professionals working with enabling technologies and service architecture in companies. It will also be of interest to academics and students studying applications/services, enabling technologies and service architectures at the universities and to anyone interested in the general issues surrounding mobile technology. Key features: Covers key topics in the B3G area including applications and services from the users, key enabling technologies, regulatory and business models, end-user evaluations and applications/services creation points of view Explains the results of major collaborative (industry-academia-SMEs) MobiLife research project Builds on previous and parallel interaction with the Wireless World Research Forum Explores pioneering legal/regulatory analysis of the challenges related to new, advanced application/service solutions including personalisation and DRM Presents qualitative evaluations and field studies of more than 250 end-users in Italy and Finland Additional material available on companion website

Mobile Evolution John Wiley & Sons

In bringing to the readers the book 5G Multimedia Communication: Technology, Multiservices and Deployment, the aim is to present current work and direction on the challenging subject of multimedia communications, with theoretical and practical roots. The past two decades have witnessed an extremely fast evolution of mobile cellular network technology. The fifth generation of mobile wireless systems has achieved the first milestone toward finalization and deployment by 2020. This is vital to the development of future multimedia communications. Also, it is necessary to consider 5G technology from the performance point of view by analyzing network capabilities to the operator and to the end user in terms of data rate, capacity, coverage, energy efficiency, connectivity and latency. The book is divided into three major parts with each part containing four to seven chapters: • Critical enabling technology • Multiservices network • Deployment scenarios The first part discusses enabling technologies, such as green communication, channel modeling, massive and distributed MIMO and ML-based networks. In the second part, different methodologies and standards for multiservices have been discussed. Exclusive chapters have been dedicated to each of the open research challenges such as multimedia operating in 5G environment, network slicing optimization, mobile edge computing, mobile video multicast/broadcast, integrated satellite and drone communication. The third part paved the way to deployment scenarios for different innovative services including integration of a multienergy system in smart cities, intelligent transportation systems, 5G connectivity in the transport sector, healthcare services, 5G edge-based video surveillance and challenges of connectivity for massive IoT in 5G and beyond systems. The book is written by experts in the field who introduced scientific and engineering concepts, covering the 5G multimedia communication areas. The book can be read cover-to-cover or selectively in the areas of interest for the readers. Generally, the book is intended for novel readers who could benefit from understanding general concepts, practitioners who seek guidance into the field and senior-level as well as graduate-level engineering students in understanding the process of today's wireless multimedia communications.

Fundamentals of Cellular Network Planning and Optimisation Springer Science & Business Media

Updated new edition covering all aspects of network planning and optimization This welcome new edition provides comprehensive coverage of all aspects of network planning in all the technologies, from 2G to 5G, in radio, transmission and core aspects. Written by leading experts in the field, it serves as a handbook for anyone engaged in the study, design, deployment and business of cellular networks. It increases basic understanding of the currently deployed, and emerging, technologies, and helps to make evolution plans for future networks. The book also provides an overview of the forthcoming technologies that are expected to make an impact in the future, such as 5G. Fundamentals of Cellular Network Planning and Optimization, Second Edition encompasses all the technologies as well as the planning and implementation details that go with them. It covers 2G (GSM, EGPRS), 3G (WCDMA) and 4G (LTE) networks and introduces 5G. The book also looks at all the sub-systems of the network, focusing on both the practical and theoretical issues. Provides comprehensive coverage of the planning aspects of the full range of today's mobile network systems, covering radio access network, circuit and packet switching, signaling, control, and backhaul/Core transmission networks New elements in book include HSPA, Ethernet, 4G/LTE and 5G Covers areas such as Virtualization, IoT, Artificial Intelligence, Spectrum Management and Cloud By bringing all these concepts under one cover, Fundamentals of Cellular Network Planning and Optimization becomes essential reading for network design engineers working with cellular service vendors or operators, experts/scientists working on end-to-end issues, and undergraduate/post-graduate students.

The GSM Evolution Palgrave Macmillan

5G Outlook - Innovations and Applications is a collection of the recent research and development in the area of the Fifth Generation Mobile Technology (5G), the future of wireless communications. Plenty of novel ideas and knowledge of the 5G are presented in this book as well as divers applications from health science to business modeling. The authors of different chapters contributed from various countries and organizations. The chapters have also been presented at the 5th IEEE 5G Summit held in Aalborg on July 1, 2016. The book starts with a comprehensive introduction on 5G and its need and requirement. Then millimeter waves as a promising spectrum to 5G technology is discussed. The book continues with the novel and inspiring ideas for the future wireless communication usage and network. Further, some technical issues in signal processing and network design for 5G are presented. Finally, the book ends up with different applications of 5G in distinct areas. Topics widely covered in this book are: • 5G technology from past to present to the future • Millimeter- waves and their characteristics • Signal processing and network design issues for 5G • Applications, business modeling and several novel ideas for the future of 5G

Fourth Generation Mobile Communication CRC Press

Der Autor erklärt Ihnen die Entwicklung von GSM/GPRS-Netzen zu GSM/EDGE Radio Access Networks (GERAN) und erläutert den GERAN-Standard. - GSM (Global System for Mobile Communications) ist das verbreitetste digitale zellulare Netzwerk weltweit; GSM-Netzwerke bieten einen Datenübertragungsdienst mit begrenzter Datenrate (9,6 kbit/s) - GPRS (General Packet Radio Service) ermöglicht effiziente Internet-Dienste mit einer Übertragungsrate von bis zu 115 kbit/s, wobei mehrere Funkkanäle einem oder mehreren Benutzern zugewiesen werden können - GERAN (GSM EDGE Radio Access Network), eine weiterentwickelte Version von EDGE (Enhanced Data Rates for Global Evolution), bietet Datenraten bis zu 473 kbit/s - das Buch bespricht die Grundlagen von GPRS und EGPRS (Funkschnittstelle sowie System- und Protokollarchitektur) - beschreibt ausführlich GPRS-, EDGE-, und GERAN-Netzwerke (einschließlich Modulations- und Codierungstechniken) - diskutiert die Leistungsfähigkeit von GSM/GPRS und GERAN

5G Outlook - Innovations and Applications Elsevier

Information and communication technologies (ICT) are a vital component of successful business models. As new technologies emerge, organizations must adapt quickly and strategically to these changes or risk falling behind. Evolution and Standardization of Mobile Communications Technology examines methods of developing and regulating compatibility standards in the ICT industry, assisting organizations in their application of the latest communications technologies in their business practices. Organizations maintain competitive advantage by implementing cutting-edge technologies as soon as they appear. This book serves as a compendium of the most recent research and development in this arena, providing readers with the insight necessary to take full advantage of a wide range of ICT solutions. This book is part of the Advances in IT Standards and Standardization Research series collection.

5G Mobile Communications Springer Science & Business Media

Essential reference providing best practice of LTE-A, VoLTE, and IoT Design/deployment/Performance and evolution towards 5G This book is a practical guide to the design, deployment, and performance of LTE-A, VoLTE/IMS and IoT. A comprehensive practical performance analysis for VoLTE is conducted based on field measurement results from live LTE networks. Also, it provides a comprehensive introduction to IoT and 5G evolutions. Practical aspects and best practice of LTE-A/IMS/VoLTE/IoT are presented. Practical aspects of LTE-Advanced features are presented. In addition, LTE/LTE-A network capacity dimensioning and analysis are demonstrated based on live LTE/LTE-A networks KPIs. A comprehensive foundation for 5G technologies is provided including massive MIMO, eMBB, URLLC, mMTC, NGCN and network slicing, cloudification, virtualization and SDN. Practical Guide to LTE-A, VoLTE and IoT: Paving the Way Towards 5G can be used as a practical comprehensive guide for best practices in LTE/LTE-A/VoLTE/IoT design, deployment, performance analysis and network architecture and dimensioning. It offers tutorial introduction on LTE-A/IoT/5G networks, enabling the reader to use this advanced book without the need to refer to more introductory texts. Offers a complete overview of LTE and LTE-A, IMS, VoLTE and IoT and 5G Introduces readers to IP Multimedia Subsystems (IMS) Performs a comprehensive evaluation of VoLTE/CSFB Provides LTE/LTE-A network capacity and dimensioning Examines IoT and 5G evolutions towards a super connected world Introduce 3GPP NB-IoT evolution for low power wide area (LPWA) network Provide a comprehensive introduction for 5G evolution including eMBB, URLLC, mMTC, network slicing, cloudification, virtualization, SDN and orchestration Practical Guide to LTE-A, VoLTE and IoT will appeal to all deployment and service engineers, network designers, and planning and optimization engineers working in mobile communications. Also, it is a practical guide for R&D and standardization experts to evolve the LTE/LTE-A, VoLTE and IoT towards 5G evolution.

Practical Guide to LTE-A, VoLTE and IoT Icon Books Ltd

This book presents insights, interpretations, concepts, and interdependent views-in the landscape of mobile connectivity and service-that emphasize the significance of a harmonious interplay, cooperation, and coalescing of a variety of interdisciplinary domains of science and art. Mobile Evolution: Insights on Connectivity and Service explores the f

Fundamentals of 5G Mobile Networks Cambridge University Press

Presenting the history of the cellular phone from its beginnings in the 1940s to the present, this book explains the fundamental concepts involved in wireless communication along with the ramifications of cellular technology on the economy, U.S. and international law, human health, and society. The first two chapters deal with bandwidth and radio. Subsequent chapters look at precursors to the contemporary cellphone, including the surprisingly popular car phone of the 1970s, the analog cellphones of the 1980s and early 1990s, and the basic digital phones which preceded the feature-laden, multipurpose devices of today.

Next Generation Mobile River Publishers

Mobile phones are a ubiquitous technology with a fascinating history. There are now as many mobile phones in the world as there are people. We carry them around with us wherever we go. And while we used to just speak into them, now mobiles are used to do all kinds of tasks, from talking to twittering, from playing a game to paying a bill. Jon Agar takes the mobile to pieces, tracing what makes it work, and puts it together again, showing how it was shaped in different national contexts in the United States, Europe, the Far East and Africa. He tells the story from the early associations with cars and the privileged, through its immense popular success, to the rise of the smartphone. Few scientific revolutions affect us in such a day-to-day way as the development of the mobile phone. Jon Agar's deft history explains exactly how this revolution has come about - and where it may lead in the future.

Evolution of Air Interface Towards 5G National Academies Press

A highly practical guide rooted in theory to include the necessary background for taking the reader through the planning, implementation and management stages for each type of cellular network. Present day cellular networks are a mixture of the technologies like GSM, EGPRS and WCDMA. They even contain features of the technologies that will lead us to the fourth generation networks. Designing and optimising these complex networks requires much deeper understanding. Advanced Cellular Network Planning and Optimisation presents radio, transmission and core network planning and optimisation aspects for GSM, EGPRS and WCDMA networks with focus on practical aspects of the field. Experts from each of the domains have brought their experiences under one book making it an essential read for design practitioners, experts, scientists and students working in the cellular industry. Key Highlights Focus on radio, transmission and core network planning and optimisation Covers GSM, EGPRS, WCDMA network planning & optimisation Gives an introduction to the networks/technologies beyond WCDMA, and explores its current status and future potential Examines the full range of potential scenarios and problems faced by those who design cellular networks and provides advice and solutions all backed up with real-world examples This text will serve as a handbook to anyone engaged in the design, deployment, performance and business of Cellular Networks. "Efficient planning and optimization of mobile networks are key to guarantee superior quality of service and user experience. They also form the essential foundation for the success of future technology development, making this book a valuable read on the road towards 4G." —Tero Ojanperä, Chief Technology Officer, Nokia Networks