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What will the future of wireless communications look like? What drives mobile communications systems beyond 3G? In Next Generation Mobile Systems the authors answer these questions and others surrounding the new technologies. The book examines the current research issues driving the wireless world and provides an inclusive overview of how established technologies will evolve to suit next generation mobile systems. While the term '4G' already dominates research in industry and academia, there are still numerous hurdles to take before this ambitious concept can become reality. Acclaimed researchers from NTT-DoCoMo take up the debate of what type of mobile communications will emerge in the post-3G era. Next Generation Mobile Systems: Covers the evolution of IP-based systems and IP mobility. Gives a detailed overview of radio-access technologies and wireless LANs. Explains APIs for mobile systems and IP mobility. Addresses middleware and applications, including terminal platform technologies, multimedia, and wireless web services. Discusses security in future mobile networks, including sections on Cryptographic Algorithms and Protocols for XG, Authentication, Authorization, and Accounting, and Security Policy Enforcement for Downloaded Code. This valuable resource will provide communications engineers, telecommunications managers and researchers in industry and academia with a sound understanding of the future direction of mobile technology.

The mobile communication systems evolved considerably in the last few years. This fact encouraged the deployment of several systems or cellular networks in multi technological environment. The Quality of Service (QoS) offered to the mobile users improves from one system to another one. The systems of third generation (3G), like UMTS, offer a better quality of service compared to that offered by those of second generation (2G), like the GSM. For example, the systems of 3.5G (HSDPA) improve the throughput of the network of 3G in the downlink direction according to the requirements of the new services. Moreover, the networks of fourth generation (4G), like WiMax (IEEE802.16e), as for them, make it possible to widen the cover of the base station while offering a very important throughput in which supports the next generation applications or services already offered by the Internet in the downlink and uplink directions. This new evolution still improves accessibility with the services of the Internet. The migration of the services of the Internet towards the mobile networks, constitutes a major stake of research in telecommunications.

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 UMTS is not about Technology, it is about Services... The UMTS or 3G environment is the ultimate convergence of fixed and mobile, voice and data, content and delivery. The result will be the largest and most complex communications system that man has designed. If you want a challenge then this is the industry to be in. Services for UMTS (Universal Mobile Telecommunication System) or 3G (3rd Generation mobile networks) is a book about the near future, where UMTS allows mobile phones and other devices for communication, entertainment, personalised services, utility and fun to be used in new ways. While it is difficult to predict the potential of UMTS in the future in a precise way, broad categories and general service ideas are emerging. This book looks at over 200 of these possible applications and provides more detailed scenarios for over 100 of them. It explores these ideas in depth, with suggestions on how to create exciting and viable services for a new world. This book intends to answer many of the current UMTS service questions as well as introduce new ideas and concepts to enable operators to create a winning UMTS services strategy. * What should the focus of service creation be to ensure early time to profit in UMTS? * What are the key market segments that should be addressed with UMTS services? * Is there a killer application or applications that will revolutionise the industry? * What are the differentiating factors that will separate the leaders from the UMTS pack? * 15 aspects of the business analyzed by value chains and business models * The 5 M's of successful UMTS Service Definition Written for the non-technical reader and with a strong business focus, Services for UMTS is a "must-read" for anybody wanting to enter the UMTS environment, make money in it, or to understand it.

Information security practices are the backbone of smart factories, which dynamically coordinate and optimize production processes based on data produced and collected by the underlying cyber-physical systems, in terms of resource usage. Recent advances in the best practices, opportunities, challenges, and benefits of information security must be studied and considered for businesses across sectors to successfully utilize the practices in their internet of things, 5G, and next-generation wireless networks. Information Security Practices for the Internet of Things, 5G, and Next-Generation Wireless Networks highlights research on secure communication of 5G, internet of things, and next-generation wireless networks along with related areas to ensure secure and internet-compatible internet of things systems. The book also discusses the effects of the internet of things technologies on various situations in smart city design. Covering a range of topics such as secure communications and security evaluations, this reference work is ideal for industry professionals, business owners, engineers, researchers, scholars, practitioners, academicians, instructors, and students.

Next Generation Wireless Systems and Networks offers an expert view of cutting edge Beyond 3rd Generation (B3G) wireless applications. This self-contained reference combines the basics of wireless communications, such as 3G wireless standards, spread spectrum and CDMA systems, with a more advanced level research-oriented approach to B3G communications, eliminating the need to refer to other material. This book will provide readers with the most up-to-date technological developments in wireless communication systems/networks and introduces the major 3G standards, such as W-CDMA, CDMA2000 and TD-SCDMA. It also includes a focus on cognitive radio technology and 3GPP E-UTRA technology; areas which have not been well covered elsewhere. Covers many hot topics in the area of next generation wireless from the authors' own research, including: Bluetooth, all-IP wireless networking, power-efficient and bandwidth-efficient air-link technologies, and multi-user signal processing in B3G wireless Clear, step-by-step progression throughout the book will provide the reader with a thorough grounding in the basic topics before moving on to more advanced material Addresses various important topics on wireless communication systems and networks that have emerged only very recently, such as Super-3G technology, 4G wireless, UWB, OFDMA and MIMO Includes a wealth of explanatory tables and illustrations This essential reference will prove invaluable to senior undergraduate and postgraduate students, academics and researchers. It will also be of interest to telecommunications engineers wishing to further their knowledge in this field.

Extensively updated evaluation of current and future network technologies, applications and devices This book follows on from its successful predecessor with an introduction to next generation network technologies, mobile devices, voice and multimedia services and the mobile web 2.0. Giving a sound technical introduction to 3GPP wireless systems, this book explains the decisions taken during standardization of the most popular wireless network standards today, LTE, LTE-Advanced and HSPA+. It discusses how these elements strongly influence each other and how network capabilities, available bandwidth, mobile device capabilities and new application concepts will shape the way we communicate in the future. This Second Edition presents a comprehensive and broad-reaching examination of a fast-moving technology which will be a welcome update for researchers and professionals alike. Key features: Fully updated and expanded to include new sections including VoLTE, the evolution to 4G, mobile Internet access, LTE-Advanced, Wi-Fi security and backhaul for wireless networks Describes the successful commercialization of Web 2.0 services such as Facebook, and the emergence of app stores, tablets and smartphones Examines the evolution of mobile devices and operating systems, including ARM and x86 architecture and their application to voice-optimized and multimedia devices

M-health can be defined as the 'emerging mobile communications and network technologies for healthcare systems.' This book paves the path toward understanding the future of m-health technologies and services and also introducing the impact of mobility on existing e-health and commercial telemedical systems. M-Health: Emerging Mobile Health Systems presents a new and forward-looking source of information that explores the present and future trends in the applications of current and emerging wireless communication and network technologies for different healthcare scenarios. It also provides a discovery path on the synergies between the 2.5G and 3G systems and other relevant computing and information technologies and how they prescribe the way for the next generation of m-health services. The book contains 47 chapters, arranged in five thematic sections: Introduction to Mobile M-health Systems, Smart Mobile Applications for Health Professionals, Signal, Image, and Video Compression for M-health Applications, Emergency Health Care Systems and Services, Echography Systems and Services, and Remote and Home Monitoring. This book is intended for all those working in the field of information technologies in biomedicine, as well as for people working in future applications of wireless communications and wireless telemedical systems. It provides different levels of material to researchers, computing engineers, and medical practitioners interested in emerging e-health systems. This book will be a useful reference for all the readers in this important and growing field of research, and will contribute to the roadmap of future m-health systems and improve the development of effective healthcare delivery systems.

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

In international comparisons the Nordic countries tend to stand out as major producers and users of information and communication technology (ICT), especially in the field of mobile telecommunications. There is a common understanding the Nordic countries were particularly well-placed to enter the booming telecommunications industry of the 1980s due to a combination of advanced demand, institutional and societal set-ups that characterize these countries. But this e-book suggests that the technological and business setting of the Nordic mobile communications is undergoing fundamental changes wit.

This book is for any telecommunications-convergence professional who needs to understand the structure of the industry, the structure of telephony networks and services, and the equipment involved. With the growing variety of networks and technologies now on offer it is inevitable that some convergence will take place between different networks, services and products. New VOIP (voice over internet protocol) networks must interwork with traditional networks. For instance, mobile phones can offer data services; wireless broadband connections to laptops will allow VOIP phone calls away from base; users could have the option of 'convergent phones' that can be used on a land-line when at home or business, but which can be used as a mobile when on the move, and so on.

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

Anyone who has ever shopped for a new smart phone, laptop, or other tech gadget knows that staying connected is crucial. There is a lot of discussion over which service provider offers the best coverage—enabling devices to work anywhere and at any time—with 4G and LTE becoming a pervasive part of our everyday language. The Handbook of Research on Next Generation Mobile Communica-

tion Systems offers solutions for optimal connection of mobile devices. From satellite signals to cloud technologies, this handbook focuses on the ways communication is being revolutionized, providing a crucial reference source for consumers, researchers, and business professionals who want to be on the frontline of the next big development in wireless technologies. This publication features a wide variety of research-based articles that discuss the future of topics such as bandwidth, energy-efficient power, device-to-device communication, network security and privacy, predictions for 5G communication systems, spectrum sharing and connectivity, and many other relevant issues that will influence our everyday use of technology.

Future wireless communication systems should be operating mainly, if not completely, on burst data services carrying multimedia traffic. The need to support high-speed burst traffic has already posed a great challenge to all currently available air-link technologies based either on TDMA or CDMA. The first generation CDMA technology has been used in both 2G and 3G mobile cellular standards and it has been suggested that it is not suitable for high-speed burst-type traffic. There are many problems with the first generation CDMA technology, such as its low spreading efficiency, interference-limited capacity and the need for precision power control, etc... 'The Next Generation Technologies' will offer first-hand information on how to make use of various innovative technologies to implement the next generation CDMA technology. As an all-in-one reference for telecommunications engineers, advanced R & D personnels, undergraduate and postgraduate students, this book is must-read material. Addresses various important issues about the next generation CDMA technologies as the major air-link technology for beyond 3G wireless applications. Covers topics from next generation CDMA system modelling to analytical methodology, starting with the basics and progressing to advanced research topics. Contains many new and previously unpublished research results. Introduces many innovative CDMA technologies such as DS/CC-CDMA, OS/CC-CDMA, space-time complementary coding CDMA, M-ary CDMA, optical complementary coded CDMA, etc.

Excellent reference with expert insight into the future evolution of mobile communications: 4G IP for 4G examines the concept of 4G, providing an in-depth background to the key technologies and developments shaping the new generation of mobile services, including Wireless Local Area Networks (WLANs), Worldwide Interoperability for Microwave Access (WiMAX), IP developments (SIP and Media Independent Handover), Internet Multimedia Subsystem (IMS), and 3G (HSDPA and LTE). The book addresses these key technological drivers in light of commercial propositions such as generating extra revenue and reducing costs, and offers an up-to-date briefing on the future of mobile communications in the coming years. Key features: Presents and analyses the key technological drivers of 4G, including WLANs, WiMAX, convergence and IMS Examines the rationale for IP for 4G by bringing together technologies, global developments and economic arguments in one single volume Describes and puts in context the developments in the IEEE 802.21 Media Independent Handover group, in particular the options for network/terminal controlled handover and the likely mechanisms for seamless handover – including application adaptation Written for readability as well as depth – with access to detailed descriptions of technologies but also quick overviews Contains scenario descriptions to motivate the need for seamless handover and benefits for the user (single sign-on access to networks, single billing) Contains hundreds of original diagrams – carefully drawn to illustrate the complex technology and quickly provide a summary of the main issues. Accompanying website supports the book with additional diagrams, figures and references for further reading IP for 4G is an invaluable reference for professionals in mobile/fixed telecoms and ICT industries, practicing telecommunications and network engineers, system designers and developers. Graduate level students studying MSc and higher-level courses on networking will also find this book of interest.

With the rapid evolution of multimedia communications, engineers and other professionals are generally forced to hoard a plethora of different texts and journals to maintain a solid grasp on essential ideas and techniques in the field. Wireless Multimedia Communications provides researchers and students with a primary reference to help readers take maximum advantage of current systems and uncover opportunities to propose new and novel protocols, applications, and services. Extract the Essentials of System Design, Analysis, Implementation A complete technical reference, the text condenses the essential topics of core wireless multimedia communication technologies, convergence, QoS, and security that apply to everything from networking to communications systems, signal processing, and security. From extensive existing literature, the authors distill the central tenets and primary methods of analysis, design, and implementation, to reflect the latest technologies and architectural concepts. The book addresses emerging challenges to inform the system standardization process and help engineers combat the high error rates and stringent delay constraints that remain a significant challenge to various applications and services. Keep Pace with Detailed Techniques to Optimize Technology The authors identify causes of information loss in point-to-point signal transmission through wireless channels, and then they discuss techniques to minimize that loss. They use examples that illustrate the differences in implementing various systems, ranging from cellular voice telephony to wireless Internet access. Each chapter has been carefully organized with the latest information to serve dual purposes as an easy-to-reference guide for professionals and as a principal text for senior-level university students.

This book constitutes the proceedings of the 12th International Conference on Green, Pervasive, and Cloud Computing, GPC 2017, held in Cetara, Italy, in May 2017 and the following colocated workshops: First International Workshop on Digital Knowledge Ecosystems 2017; and First Workshop on Cloud Security Modeling, Monitoring and Management, CS3M 2017. The 58 full papers included in this volume were carefully reviewed and selected from 169 initial submissions. They deal with cryptography, security and biometric techniques; advances network services, algorithms and optimization; mobile and pervasive computing; cybersecurity; parallel and distributed computing; ontologies and smart applications; and healthcare support systems.

Summarizes and surveys current LTE technical specifications and implementation options for engineers and newly qualified support staff Concentrating on three mobile communication technologies, GSM, 3G-WCDMA, and LTE—while majorly focusing on Radio Access Network (RAN) technology—this book describes principles of mobile radio technologies that are used in mobile phones and service providers' infrastructure supporting their operation. It introduces some basic concepts of mobile network engineering used in design and rollout of the mobile network. It then follows up with principles, design constraints, and more advanced insights into radio interface protocol stack, operation, and dimensioning for three major mobile network technologies: Global System Mobile (GSM) and third (3G) and fourth generation (4G) mobile technologies. The concluding sections of the book are concerned with further developments toward next generation of mobile network (5G). Those include some of the major features of 5G such as a New Radio, NG-RAN distributed architecture, and network slicing. The last section describes some key concepts that may bring significant enhancements in future technology and services experienced by customers. Introduction to Mobile Network Engineering: GSM, 3G-WCDMA, LTE and the Road to 5G covers the types of Mobile Network by Multiple Access Scheme; the cellular system; radio propagation; mobile radio channel; radio network planning; EG-PRS - GPRS/EDGE; Third Generation Network (3G), UMTS; High Speed Packet data access (HSPA); 4G-Long Term Evolution (LTE) system; LTE-A; and Release 15 for 5G. Focuses on Radio Access Network technologies which empower communications in current and emerging mobile network systems Presents a mix of introductory and advanced reading, with a generalist view on current mobile network technologies Written at a level that enables readers to understand principles of radio net-

work deployment and operation Based on the author's post-graduate lecture course on Wireless Engineering Fully illustrated with tables, figures, photographs, working examples with problems and solutions, and section summaries highlighting the key features of each technology described Written as a modified and expanded set of lectures on wireless engineering taught by the author, Introduction to Mobile Network Engineering: GSM, 3G-WCDMA, LTE and the Road to 5G is an ideal text for post-graduate and graduate students studying wireless engineering, and industry professionals requiring an introduction or refresher to existing technologies.

All-in-one, application-and service-focused look at 3G cellular Want to know exactly how existing wireless technologies are evolving into a vital third generation -- and how this trend impacts the bottom line? You'll find the answers in 3G Cellular & PCs Demystified, by Lawrence Harte, Richard Levine, Roman Kikta. This plain-language guide fills you in on the different technology types, design issues for handset and network systems, economics, and the future of 3G --vital topics for anyone working in the field, from marketing managers to technicians. Helpful appendices identify key companies involved with the products and services highlighted in the book. In addition to an introduction to 3G wireless basics and industry terms, you get: History, system overviews, basic operation, world system descriptions of cellular systems...North American TDMA...and Code Division Multiple Access Radio channel structure, signaling, and system parameters of digital wireless Global System for mobile (GSM) communications Wireless Office telephone systems Cordless telephone technology, including residential cordless handsets, CT2, CT3, IS-91A 3G mobile telephones and networks Wireless telephone system equipment costs, network capital costs, operational costs Future advances for 4th generation systems More

Written in a clear and concise manner, this book presents readers with an in-depth discussion of the 5G technologies that will help move society beyond its current capabilities. It perfectly illustrates how the technology itself will benefit both individual consumers and industry as the world heads towards a more connected state of being. Every technological application presented is modeled in a schematic diagram and is considered in depth through mathematical analysis and performance assessment. Furthermore, published simulation data and measurements are checked. Each chapter of 5G Physical Layer Technologies contains texts, mathematical analysis, and applications supported by figures, graphs, data tables, appendices, and a list of up to date references, along with an executive summary of the key issues. Topics covered include: the evolution of wireless communications; full duplex communications and full dimension MIMO technologies; network virtualization and wireless energy harvesting; Internet of Things and smart cities; and millimeter wave massive MIMO technology. Additional chapters look at millimeter wave propagation losses caused by atmospheric gases, rain, snow, building materials and vegetation; wireless channel modeling and array mutual coupling; massive array configurations and 3D channel modeling; massive MIMO channel estimation schemes and channel reciprocity; 3D beamforming technologies; and linear precoding strategies for multiuser massive MIMO systems. Other features include: In depth coverage of a hot topic soon to become the backbone of IoT connecting devices, machines, and vehicles Addresses the need for green communications for the 21st century Provides a comprehensive support for the advanced mathematics exploited in the book by including appendices and worked examples Contributions from the EU research programmes, the International telecommunications companies, and the International standards institutions (ITU; 3GPP; ETSI) are covered in depth Includes numerous tables and illustrations to aid the reader Fills the gap in the current literature where technologies are not explained in depth or omitted altogether 5G Physical Layer Technologies is an essential resource for undergraduate and postgraduate courses on wireless communications and technology. It is also an excellent source of information for design engineers, research and development engineers, the private-public research community, university research academics, undergraduate and postgraduate students, technical managers, service providers, and all professionals involved in the communications and technology industry.

UMTS (Universal Mobile Telecommunication System) is the third generation telecommunications system based on WCDMA. WCDMA (Wideband Code Division Multiple Access) is the radio interface for UMTS. WCDMA is characterised by use of a wider band than CDMA. It has additional advantages of high transfer rate, and increased system capacity and communication quality by statistical multiplexing, etc. WCDMA efficiently utilises the radio spectrum to provide a maximum data rate of 2 Mbit/s.

UMTS (Universal Mobile Telecommunication System) will offer a consistent set of services to mobile computer and phone users no matter where they are located in the world. Based on the GSM (Global System for Mobile communication) communication standard, UMTS, endorsed by major standards bodies and manufacturers, is the planned standard for mobile users around the world by 2002. Today's cellular telephone systems are mainly circuit-switched, with connections always dependent on circuit availability. Packet-switched connection, using the Internet Protocol (IP), means that a virtual connection is always available to any other end point in the network. It will also make it possible to provide new services, such as alternative billing methods (pay-per-bit, pay-per-session, flat rate, asymmetric bandwidth, and others). The higher bandwidth of UMTS also promises new services, such as video conferencing and promises to realise the Virtual Home Environment (VHE) in which a roaming user can have the same services to which the user is accustomed when at home or in the office, through a combination of transparent terrestrial and satellite connections. * Provides an introduction to cellular networks and digital communications * Covers the air interface, radio access network and core network * Explains the Release '99 specifications clearly and effectively * Discusses UMTS services and future services beyond 3G * Features numerous problems and solutions in order to aid understanding Ideal for Academics and students on telecommunications, electronics and computer science courses, research and development engineers working in mobile/wireless communications and Cellular operators and technical consultants.

Inhaltsangabe:Abstract: We are facing an increasing bandwidth in the mobile systems and this opens up for new applications in a mobile terminal. It will be possible to download, record, send and receive images and videosequences. Even if we have more bandwidth, images and video data must be compressed before it can be sent, because of the amount of information it contains. MPEG-4 and H.263 are standards for compression of video data. The problem is that encoding and decoding algorithms are computationally intensive and complexity increases with the size of the video. In mobile applications, processing capabilities such as memory space and calculation time are limited and optimized algorithms for decoding and encoding are necessary. The question is if it is possible to encode raw video data with low complexity. Single frames e.g. from a digital camera, can then be coded and transmitted as a video sequence. On the other hand, the decoder needs to be able to handle sequences with different resolution. Thus, decoder in new mobile terminals must decode higher resolution sequences with the same complexity as low resolution video requires. The work will involve literature studies of MPEG-4 and H.263. The goal is to investigate the possibility to encode video data with low complexity and to find a way for optimized downscaling of larger sequences in a decoder. The work should include - Literature studies of MPEG-4 and H.263. - Theoretical study how CIF sequences (352x288-pixel) can be downscaled to QCIF (176x144-pixel) size. - Finding of optimized algorithms for a low complexity encoder. - Implementation of such an encoder in a microprocessor, e.g. a DSP. - Complexity analysis of processing consumption. Prerequisite experience is fair C-programming, signalprocessing skills and basic knowledge in H.263 and MPEG-4 is useful. New mobile communication standards provide an increased bandwidth, which opens up for many new media ap-

plications and services in future mobile phones. Video recording using the MMS standard, video conferencing and downloading of movies from the Internet are some of those applications. Even if the data rate is high, video data needs to be compressed using international video compression standards such as MPEG-4 or H.263. Efficient video compression algorithms are the focus of this thesis. Very limited computational capabilities of the terminals require low complexity encoder and decoder. A low complexity encoder for usage with [...]

Next generation wireless and mobile cellular networks are expected to support multimedia applications with different quality of service (QoS). User mobility and time-varying multipath fading of wireless channels make QoS provisioning a challenging issue in wireless and mobile networks. In order to provide service differentiation and QoS guarantee in such networks, many new technologies have been proposed. Wideband code division multiple access (WCDMA) is the major multiple access technology for the third generation (3G) and beyond mobile communication systems. One major challenge in multimedia services over WCDMA-based networks is QoS provisioning with efficient resource utilization. The allocation and management of radio resources are crucial for such networks, where the scarce wireless spectrum resources are shared by multiple users. On the other hand, in the standard layered networking architecture, each layer is designed and operated independently. However, wireless channels suffer from both interference and inherent instability; moreover, the statistical channel characteristics of different users are different.

The 2004 IFIP International Conference on Intelligence in Communication Systems (INTELLCOMM 2004), held in Bangkok, Thailand, 23-26 November 2004, was the successor and an expansion of SMARTNET, a series of annual conferences on intelligence in networks held during 1995-2003 under the auspices of IFIP TC6's Working Group 6.7. The Internet and Web provide more connection facilities, hence the man-man, man-machine and machine-machine interactions will increase and communication will have an important role in modern systems. In order to obtain effective and efficient communication, artistic, social and technical issues have to be tackled in a holistic and integrated manner. However, communication techniques, concepts and solutions which have been developed so far treat these issues separately, so that there arises a need for communication researchers and practitioners in different fields (engineering, science and arts) to meet, share their experience and explore all possibilities of developing integrated and advanced solutions which incorporate ideas from such disciplines as communication arts, art design, linguistics, Web technologies, computer system architecture and protocols, computer science and artificial intelligence. INTELLCOMM 2004 was jointly sponsored by IFIP WG 6.7: Smart Networks and WG 6.4: Internet Applications Engineering and aimed to provide an international forum which brings academia, researchers, practitioners and service providers together. The discussion areas covered the latest research topics and advanced technological solutions in the area of intelligence in communication systems, ranging from architectures for adaptable networks/services and Semantic Web/Webservice technologies to intelligent service application interface and intelligent human interaction. INTELLCOMM 2004 received 112 paper submissions from 28 countries. From these, 24 were accepted, and are included in this proceedings. There were also 3 papers accepted for poster presentation, published separately.

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.

Germany (2001); Sophia Antipolis, France (2002); Oxford, UK (2004); Montréreal, Canada (2005); New York, USA (2006) and Tallinn, Estonia (2007).

Intended for a graduate course on wireless communications, this textbook concentrates more on conceptual fundamentals than on rigorous mathematical treatment. The author first describes the radio environment, discussing issues of radio wave propagation theory, signal strength, and radio coverage are

This book constitutes the refereed post-proceedings of the second international joint workshops on Wireless and Mobility and on New Trends in Network Architectures and Services organized by the European Network of Excellence on Next Generation Internet, EURO-NGI 2005. The 19 revised full research papers presented together with 1 invited talk are organized in topical sections on wireless solutions, QoS support in next generation networks, and peer to peer architectures and algorithms.

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.

3G networks: architecture, planning, migration, management, and optimization. Network architectures, planning, management, and optimization 3G air interfaces: UTRA/W-CDMA and cdma2000 3G data services: UTRA/W-CDMA, cdma2000, GPRS, and EDGE Evolutionary paths for 2G networks WLL, WAP, and more New 3G systems will trigger an explosion in wireless Internet and data applications by delivering far higher data rates than have ever been possible in wireless systems before. In "Wireless Network Evolution: 2G to 3G," renowned wireless expert Vijay K. Garg covers key 3G standard and every technical issue associated with planning, management, and optimization of 3G systems. Garg reviews the fundamental principles underlying existing 2G systems, then offers specific, practical guidance on migration to 3G. Coverage includes: 3G standards activities 3G European and North American systems 3G data services for UTRA/W-CDMA, cdma2000, GPRS, and EDGE networks Wireless Application Protocol (WAP) and 3G systems Major 3G enhancements for WLL applications New RF optimization techniques for 3G systems "Wireless Network Evolution: 2G to 3G" will be an invaluable resource for every practicing telecommunications engineer and technical decision maker in-

involved in 3G planning, deployment, or management.

In this book, the spectacular development of a digital telecommunications infrastructure in one of the world's most advanced industrial nations is being reviewed. Starting with the university network JUNET in 1984 the work covers the mobile Internet, wired access and backbone systems, all the way through broadband applications and today's residential broadband traffic. Japan has established one of the richest Internet environments and undertakes an aggressive R & D activity on both the New Generation Network "NGN" and the new Internet Protocol "IPv6". In 2007, it was reported that in the cellular phone system in Japan, the total volume of data traffic became larger than that of voice traffic. The telecommunication infrastructure is converging with the broadcasting infrastructure: 2011 is designated as the first year of the full digital age. Towards 2011, the following technical challenges are foreseen: the development and deployment of an end-to-end architecture on the existing complex IPv4 based Internet; development of a Japanese infrastructure, which is globally competitive and globally interoperable; development of new applications and new business models in the ubiquitous networking environment; development of Internet systems as a social infrastructure; integration with the real-space (i.e. integration of physical space and cyber space); NGN (Next Generation Network) and FMC (Fixed Mobile Convergence); and development and deployment of the unwired Internet environment. This work looks into the challenges and opportunities now faced: it is a must reading for communications and media experts, policy makers and the general public interested in the digital infrastructure

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.

This two-volume set of CCIS 391 and CCIS 392 constitutes the refereed proceedings of the Fourth International Conference on Information Computing and Applications, ICICA 2013, held in Singapore, in August 2013. The 126 revised full papers presented in both volumes were carefully reviewed and selected from 665 submissions. The papers are organized in topical sections on Internet computing and applications; engineering management and applications; Intelligent computing and applications; business intelligence and applications; knowledge management and applications; information management system; computational statistics and applications.

Mobile and Wireless Systems Beyond 3G: Managing New Business Opportunities explores new business opportunities and critical issue related to mobile and wireless systems beyond 3G. This book identifies motivations and barriers to the adoption of 3G mobile multimedia services and provides an end-user perspective on mobile multimedia services that are likely to emerge with the roll out of Third Generation Mobile Services (3G). Mobile and Wireless Systems beyond 3G: Managing New Business Opportunities presents a single source of up-to-date information about mobile commerce including the technology (hardware and software) involved, security issues and factors driving demand adoption (consumer and business). This book provides researchers and practitioners with a source of knowledge related to this emerging area of business, while also facilitating managers and business leaders' understanding of the industrial evolutionary processes.

Broadband Wireless Mobile (3G and 4G) will be the next key developments in wireless communications. Immense interest has been fuelled by large demand for high frequency utilisation as well as a large number of users requiring simultaneous multidimensional high data rate access for the applications of wireless mobile internet and e-commerce. Broadband wireless mobile extends the corporate LAN to common areas such as meeting rooms and enables in-building public wireless hotspots such as airport lounges to provide wireless portable computer connectivity. People will be able to access information as if they were at their desk and will be able to communicate reliably and access securely the information most important to them, such as email, corporate data and the Internet. The 3G/4G systems will use a new network architecture (eg All-IP NET) to deliver broadband services in a more generic configuration to mobile customers and supports multidimensional services and emerging interactive multimedia communications. The world of telecommunications will continue to migrate toward wireless technologies and will ultimately provide users with mobile access to all types of media and information in a variety of forms including media phones and portable computers. * Provides coverage of 4G mobile - the newest development by ITU (International telecommunication Union) * Covers range of emerging wireless applications including WAP and iMode * Provides a world perspective on the topic as the authors are from USA, Europe and Japan An essential reference for engineers and researchers in the field of wireless communications systems (and electrical engineering), network planners and operators, as well as a valuable reference for students and management, marketing, sales or investor personnel in the area of wireless communications.

This volume includes extended and revised versions of a set of selected papers from the International Conference on Electric and Electronics (EEIC 2011), held on June 20-22, 2011, which is jointly organized by Nanchang University, Springer, and IEEE IAS Nanchang Chapter. The objective of EEIC 2011 Volume 2 is to provide a major interdisciplinary forum for the presentation of new approaches from Electrical engineering and controls, to foster integration of the latest developments in scientific research. 133 related topic papers were selected into this volume. All the papers were reviewed by 2 program committee members and selected by the volume editor Prof. Min Zhu. We hope every participant can have a good opportunity to exchange their research ideas and results and to discuss the state of the art in the areas of the Electrical engineering and controls.

Fourth-Generation Wireless Networks: Applications and Innovations presents a comprehensive collection of recent findings in access technologies useful in the architecture of wireless networks.

The technological progress in multi-carrier (MC) modulation led orthogonal frequency division multiplexing (OFDM) to become an important part of beyond 3G cellular mobile communication standards, including LTE and WiMAX. In addition, the flexibility offered by the spread spectrum (SS) and time division multiplexing (TDM) techniques motivated many researchers to investigate several MC combined multiple access schemes, such as MC-CDMA, OFDMA and MC-TDMA. These schemes benefit from the advantages of each sub-system and offer high flexibility, high spectral efficiency, simple detection strategies and narrow-band interference rejection capability. Multi-Carrier and Spread Spectrum Systems is one of the first books to describe and analyze the basic concepts of multi-carrier OFDM transmission and its combination with spread spectrum (MC-CDMA). The different architectures and detection strategies as well as baseband-related transceiver components are explained. This includes topics like FEC channel coding and decoding, modulation and demodulation (IFFT/FFT), digital I/Q-generation, time and frequency synchronisation, channel estimation, frequency domain equalization and RF aspects such as phase noise and non-linearity issues. Concrete examples of its applications for cellular mobile communication systems (B3G/4G) are given. Further derivatives of MC-SS (such as OFDMA, SS-MC-MA and DFT-spread OFDM) and their corresponding applications in the LTE, WiMAX, WLAN and DVB-RCT standards are detailed. Capacity and flexibility enhancements of multi-carrier OFDM systems by different MIMO diversity techniques such as space time/frequency coding (STC, SFC) and software defined radio concepts are also described. Written in a highly accessible manner this book provides a unique reference on the topics of multi-carrier and spread spectrum communications, assisting 4G engineers with their implementation. Fully updated new edi-

tion of successful text, including two new chapters on LTE and WiMAX Describes in detail new applications of OFDM in mobile communication standards Examines all multi-carrier spread spectrum schemes, with in-depth analysis, from theory to practice Introduces the essentials of important wireless standards based on multi-carrier/spread spectrum techniques.

Next Generation Mobile Broadcasting provides an overview of the past, present, and future of mobile multimedia broadcasting. The first part of the book-Mobile Broadcasting Worldwide-summarizes next-generation mobile broadcasting technologies currently available. This part covers the evolutions of the Japanese mobile broadcasting standard ISDB-T One