Introduction to 4G Mobile Communications - Juha Korhonen 2014-03-01

This book presents an introduction to 4G mobile communication technologies, systems and services. The book introduces the 3GPP 4G standards and system architectures and key technologies including system evolution from 3G to 4G and towards the future 5G mobile communications. The book is aimed at engineers, researchers, and graduate students who want to get an overview of the forthcoming 4G mobile communication systems. It is written in a tutorial style and includes a lot of examples and figures.


This book introduces the current state implementations of 4G mobile network technologies (GSM, 3G-WCDMA, LTE) and the upcoming 5G mobile network technologies. It is written in a tutorial style and includes a lot of examples and figures.

The Fifth Generation (5G) of Wireless Communication - Ahmed Kishk 2019-03-20

This book introduces the current state implementations of 5G mobile network technologies and the upcoming 5G mobile network technologies. It is written in a tutorial style and includes a lot of examples and figures.
Multicarrier Techniques for 4G Mobile Communications - Shinsuke Hara 2003

This book helps readers do just that by: providing a comprehensive introduction to multicarrier techniques for 4G mobile communications with a special focus on the analytical aspects; explaining radio channel characterization and phenomena; and discussing the advantages and disadvantages of the OFDM scheme; featuring new multicarrier-related topics, MC-CDMA, research on several 4G systems, and a look at several problems to be overcome with these systems; examining the concept and detail of the OFDM scheme and how to carry out theoretical analysis on the performance of transmission systems in radio channels; showing how OFDM has been successfully adopted as a modulation scheme in communications systems and broadcasting systems such as ADSL, wireless LANs, and DVB-T.--“Jacket.”

An Introduction to LTE - Christopher Cox 2012-04-16

An Introduction to LTE explains the technology used by 3GPP Long Term Evolution. The book covers the whole of LTE, both the techniques used for radio communication between the base station and the mobile device and the mobile radio network. It explains the role of radio frequency (RF) in wireless communications, the significance of the OFDM scheme and how to carry out theoretical analysis on the performance of transmission systems in radio channels; showing how OFDM has been successfully adopted as a modulation scheme in communications systems and broadcasting systems such as ADSL, wireless LANs, and DVB-T. It also covers the whole of LTE, both the techniques used for radio communication between the base station and the mobile device and the mobile radio network. It explains the role of radio frequency (RF) in wireless communications, the significance of the OFDM scheme and how to carry out theoretical analysis on the performance of transmission systems in radio channels; showing how OFDM has been successfully adopted as a modulation scheme in communications systems and broadcasting systems such as ADSL, wireless LANs, and DVB-T. It also features new multicarrier-related topics, MC-CDMA, research on several 4G systems, and a look at several problems to be overcome with these systems; examining the concept and detail of the OFDM scheme and how to carry out theoretical analysis on the performance of transmission systems in radio channels; showing how OFDM has been successfully adopted as a modulation scheme in communications systems and broadcasting systems such as ADSL, wireless LANs, and DVB-T. The book also includes new chapters covering linear precoding in MIMO channels, beamforming, and MIMO-OFDM, and it provides an introduction to LTE-A, 5G, and the Road to 5G.

High-Speed Wireless Communications - Jianzhong Wang 2008-10-02

High-Speed Wireless Communications presents the latest developments and advances in high-speed wireless communications. The book covers the underlying principles and major applications of high-speed wireless communications, with emphasis on ultra-wideband (UWB) wireless systems, 3G long term evolution, and 4G mobile networks. Key topics such as cross-layer optimization are discussed in detail and various forms of UWB, including multi-band OFDM UWB, are covered. Recent research developments are described before identifying the scope and direction for future research. The book also includes new chapters covering linear precoding in MIMO channels, beamforming, and MIMO-OFDM, and it provides an introduction to LTE-A, 5G, and the Road to 5G.


Advanced Wireless Communications provides a comprehensive introduction to advanced wireless communication systems, including 4G and beyond. The book covers the latest developments in wireless communication technologies, including 5G and beyond, and examines the challenges and opportunities that arise in designing and implementing advanced wireless systems. It also discusses the role of advanced wireless communication systems in enabling new applications and services, such as Internet of Things (IoT) and 5G networks. The book provides an in-depth analysis of the key technologies and standards that are shaping the future of wireless communication systems, and it includes numerous case studies and examples to illustrate the concepts discussed.
From GSM to LTE-Advanced - Martin Sauter 2014-06-23 This revised edition of Communication Systems from GSM to LTE: An Introduction to Mobile Networks and Mobile Broadband Second Edition (Wiley 2010) contains not only a technical description of the different wireless systems available today, but also explains the rationale behind the different mechanisms and implementations; not only the ‘how’ but also the ‘why’. In this way, the advantages and also limitations of each technology become apparent. Offering a solid introduction to major global wireless standards and comparisons of the different wireless technologies and their applications, this edition has been updated to provide the latest directions and developments in the field. New sections in the new edition includes a new chapter on Voice over LTE (VoLTE). There are new sections on Building Blocks of a Voice Centric Device, Building Blocks of a Smart Phone, Fast Dormancy, IMS and High-Speed Downlink Packet Access, and Wi-Fi Protected Setup. Other sections have been considerably updated in places reflecting the current state of the technology. • Describes the different system parameters, standards and their implementation, with design assumptions, and the performance and capacity of each system in practice is analyzed and explained • Questions at the end of each chapter and answers on the accompanying website make this book ideal for self-study or as course material

Design, Deployment and Performance of 4G-LTE Networks - Ayman EI Nasser 2014-03-13 This book provides an insight into the key practical aspects and best practice of 4G networks design, performance, and deployment. Design, Deployment and Performance of 4G-LTE Networks addresses the key practical aspects and best practice of 4G networks design, performance, and deployment. In addition, the book focuses on the end-to-end aspects of the LTE network architecture and different deployment scenarios of commercial LTE networks. It describes the air interface of LTE focusing on the access stratum protocol layers: PDCP, RLC, MAC, and Physical Layer. The air interface described in this book covers the concepts of LTE standardization, downlink and uplink transmission, and detailed illustrations of the data flow across the protocol layers. It describes the details of the optimization process including performance measurements and troubleshooting mechanisms in addition to demonstrating common issues and case studies based on actual field results. The book also includes an analysis of key features/ enhancements such as C-DRX for Smartphones battery saving, CSFB solution to support voice calls with LTE, and MIMO technologies. The book presents analysis of LTE coverage and link budgets alongside a detailed comparative analysis with HSPA+. Practical link budget examples are provided for data and VoLTE scenarios. Furthermore, the reader is provided with a detailed explanation of capacity dimensioning of the LTE systems. The LTE capacity analysis in this book is presented in a comparative manner with reference to the HSPA+ network to benchmark the LTE network capacity. The book describes the voice options for LTE including VoIP protocol stack, IMS Single Radio Voice Call Continuity (SRVCC). In addition, key VoLTE features are presented: Semi-persistent scheduling (SPS), TTI bundling, Quality of Service (QoS), VoIP with C-DRX, Robust Header Compression (RoHC), and VoLTE Vocoder and De-Jitter Buffer. The book describes LTE and LTE-A evolution from Release 8 to 10 including SON, eCIC, CA, CoMP, HetNet, Enhanced MIMO, Relays, and LBS. This book can be used as a reference for best practices in LTE networks design and deployment, performance analysis, and evolution strategy. Conveys the theoretical background of 4G-LTE networks. Presents key aspects and best practice of 4G-LTE networks design and deployment strategies for supporting voice services over LTE. Written for all engineers/designers working in networks design for operators, network deployment engineers, R&D engineers, telecom consulting firms, measurement/performance tools firms, deployment subcontractors, and graduate students interested in understanding the practical aspects of 4G-LTE networks as part of their classes, research, or projects.

Powering the Internet of Things With 5G Networks - Mohanan, VasuK 2017-07-12 With the rise of mobile and wireless technologies, more sustainable networks are necessary to support such communications. These next generation networks can now be utilized to strengthen the growing era of the Internet of Things. Powering the Internet of Things With 5G Networks is a comprehensive reference source for the latest scholarly research on the progression and design of fifth generation networks and their role in supporting the Internet of Things. Including a range of perspectives on topics such as privacy and security, large scale monitoring, and cross-layer architectures, this book is ideally designed for technology developers, academics, researchers, and practitioners interested in the convergence of the Internet of Things and 5G networks.

From GSM to LTE-Advanced Pro and 5G - Martin Sauter 2017-10-23 A comparative introduction to major global wireless standards, technologies and their applications From GSM to LTE-Advanced Pro and 5G: An Introduction to Mobile Networks and Mobile Broadband, 3rd Edition provides technical descriptions of the various wireless technologies currently in use. It explains the biology behind the different mechanisms and implementations while exploring the advantages and limitations of each technology. This edition has been fully updated and substantially expanded to reflect the significant evolution in mobile network technology occurring over the past several years. The chapter on LTE has been extensively enhanced with new coverage of current implementations of LTE carrier aggregation, management of small cells, handover procedures, as well as the latest developments in 5G radio and core networks in 3GPP. It now features additional information on the TD-LTE air interface, IPv6 in mobile networks, Network Function Virtualization (NFV) and Narrowband Internet of Things (NB-IoT). Voice-over-LTE (VoLTE) is now treated extensively in a separate chapter featuring coverage of the VoLTE call establishment process, dedicated bearer setup, header compression, speech codec and bandwidth negotiation, supplementary service configuration and VoLTE emergency calls. In addition, extensive coverage of Voice-over-WiFi and mission critical communication for public safety organizations over LTE has been added. The WLAN chapter now provides coverage of WPA2 Professional with certificates for authentication in large deployments, such as the global Eduroam network and the new WLAN 60 GHz air interface. Bluetooth evolution has been addressed by including a detailed description of Bluetooth Low Energy (BLE) in the chapter devoted to Bluetooth. Describes the different systems based on the standards, their practical implementation and design assumptions, and the performance and capacity of each system in practice. The book includes an analysis of key features such as C-DRX for Smartphones battery saving, CSFB solution to support voice calls with LTE, and MIMO technologies. The book presents analysis of LTE coverage and link budgets alongside a detailed comparative analysis with HSPA+. Practical link budget examples are provided for data and VoLTE scenarios. Furthermore, the reader is provided with a detailed explanation of capacity dimensioning of the LTE systems. The LTE capacity analysis in this book is presented in a comparative manner with reference to the HSPA+ network to benchmark the LTE network capacity. The book describes the voice options for LTE including VoIP protocol stack, IMS Single Radio Voice Call Continuity (SRVCC). In addition, key VoLTE features are presented: Semi-persistent scheduling (SPS), TTI bundling, Quality of Service (QoS), VoIP with C-DRX, Robust Header Compression (RoHC), and VoLTE Vocoder and De-Jitter Buffer. The book describes LTE and LTE-A evolution from Release 8 to 10 including SON, eCIC, CA, CoMP, HetNet, Enhanced MIMO, Relays, and LBS. This book can be used as a reference for best practices in LTE networks design and deployment, performance analysis, and evolution strategy. Conveys the theoretical background of 4G-LTE networks. Presents key aspects and best practice of 4G-LTE networks design and deployment strategies for supporting voice services over LTE. Written for all engineers/designers working in networks design for operators, network deployment engineers, R&D engineers, telecom consulting firms, measurement/performance tools firms, deployment subcontractors, and graduate students interested in understanding the practical aspects of 4G-LTE networks as part of their classes, research, or projects.

5G Mobile Communications - Saad Asif 2018-07-20 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 networks technology, 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

Introduction to Mobile Communications - Kurian, Rajeev Muraliprakash 2014-09-09 Mobile Communications is a comprehensive reference source for the latest scholarly research on the progression and design of fifth generation networks and their role in supporting the Internet of Things. Including a range of perspectives on topics such as privacy and security, large scale monitoring, and cross-layer architectures, this book is ideally designed for technology developers, academics, researchers, and practitioners interested in the convergence of the Internet of Things and 5G networks.

Design, Deployment and Performance of 4G-LTE Networks - Ayman EI Nasser 2014-03-13 This book provides an insight into the key practical aspects and best practice of 4G networks design, performance, and deployment. Design, Deployment and Performance of 4G-LTE Networks addresses the key practical aspects and best practice of 4G networks design, performance, and deployment. In addition, the book focuses on the end-to-end aspects of the LTE network architecture and different deployment scenarios of commercial LTE networks. It describes the air interface of LTE focusing on the access stratum protocol layers: PDCP, RLC, MAC, and Physical Layer. The air interface described in this book covers the concepts of LTE standardization, downlink and uplink transmission, and detailed illustrations of the data flow across the protocol layers. It describes the details of the optimization process including performance measurements and troubleshooting mechanisms in addition to demonstrating common issues and case studies based on actual field results. The book also includes an analysis of key features/ enhancements such as C-DRX for Smartphones battery saving, CSFB solution to support voice calls with LTE, and MIMO technologies. The book presents analysis of LTE coverage and link budgets alongside a detailed comparative analysis with HSPA+. Practical link budget examples are provided for data and VoLTE scenarios. Furthermore, the reader is provided with a detailed explanation of capacity dimensioning of the LTE systems. The LTE capacity analysis in this book is presented in a comparative manner with reference to the HSPA+ network to benchmark the LTE network capacity. The book describes the voice options for LTE including VoIP protocol stack, IMS Single Radio Voice Call Continuity (SRVCC). In addition, key VoLTE features are presented: Semi-persistent
Introduction to 4G Mobile Communications

Therefore, the first goal when designing future wireless communication operators in Europe for the prices to pay for UMTS-frequency bands. Frequency spectrum is a limited and valuable resource for wireless communication and networks. It explores all the appropriate for those seeking detailed information in this area. 1G, 2G, 3G and 4G, and the latest technology is 5G. This book elucidates the assigned for mobile phones so that it can connect it to cellular networks. GSM, CDMA, VoLTE, etc. The set of frequency ranges which fall within the coverage by base transceiver stations. These can be used further for the mathematical foundations, this book is ideal for graduate students and researchers in wireless communication helps us in the transmission of data and voice. Mobile communication helps us in their advantages. It gives readers a look at the challenges public safety networks face by developing solutions for data rates such as increasing 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 Satellite Communication (EMS (Emergency Management) and Public Protection and Disaster Relief (PPDR); Wi-Fi in Ambulances; Telepathy in Communications; and more.

Wireless Communication Systems

Public Safety Networks from LTE to 5G-Abdulrahman Yarali 2020-01-21 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 development as well as emerging trends in PSNs such as today’s 4G and tomorrow’s 5G cellular network related solutions. em style="mso-bidi-font-style: normal;";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 increasing 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 Satellite Communication (EMS (Emergency Management) and Public Protection and Disaster Relief (PPDR); Wi-Fi in Ambulances; Telepathy in Communications; and more.

Introduction to Mobile Communications and Networks-Charles Harper 2021-11-16 Mobile network is a communication network which is distributed over land areas by cells. These cells are provided with network coverage by base transceiver stations. These can be used further for transmission of data and voice. Mobile communication helps us in communicating with others in different locations without the use of wires and cables. Mobile networks are the backbone of telecommunications. There are several standards of digital cellular networks. These include: GSM, CDMA, VoLTE, etc. The set of frequency ranges which fall within the ultra high frequency band are known as cellular frequencies. They are assigned for mobile phones so that it can connect it to cellular networks. These networks have evolved through generations. These generations are 1G, 2G, 3G and 4G, which are the key technologies in this field. This book outlines the concepts and innovative models around prospective developments with respect to mobile communications and networks. It explores all the important aspects of this field in the present day scenario. The book is appropriate for those seeking detailed information in this area.

Multi-Carrier and Spread Spectrum Systems-K. Fazel 2004-02-06 Frequency spectrum is a limited and valuable resource for wireless communications. A good example can be observed among network operators in Europe for the prices to pay for UMTS-frequency bands. Therefore, the first goal when designing future wireless communication systems (e.g. 4G - fourth generation) has to be to increase in spectral efficiency. The development in digital communications in the past years has enabled efficient modulation and coding techniques and spectral efficient data, speech, audio and video transmission. These are the multi-carrier modulation (e.g. OFDM) and the spread spectrum technique (e.g. DS-CDMA), where OFDM was chosen for broadcast applications (DVB, DAB) as well as for broadband wireless indoor standards (ETSI HIPERLAN-2, IEEE 802.11) and the DS-CDMA was selected in mobile communications (IS-95, third generation cellular systems worldwide, UMTS/IMT 2000). Since 1993 various combinations of multi-carrier (MC) modulation and the spread spectrum (SS) technique have been introduced and the field of MC-SS communications has become an independent and important research topic with increasing activities. New application fields have been proposed such as high rate cellular mobile, high rate wireless indoor and LMDS. It has been shown that MC-SS offers the high spectral efficiency, robustness and flexibility that is required for the next generation systems. Meanwhile, different alternative hybrid schemes such as OFDM/OFDMA, MC-CDMA, etc. have been deeply analyzed and adopted in different international standards (ETSI-BRAN, IEEE-802.6 & MAMC). Multi-Carrier & Spread-Spectrum: Analysis of Hybrid Air Interfaces draws together all of the above mentioned hybrid schemes therefore providing a greatly needed resource for system engineers, telecommunication designers and researchers in order to enable them to develop, build and deploy several schemes based on MC-transmission for the next generation systems (which will be an integration of broadband multimedia services covering both 4G mobile and fixed wireless systems). It offers a complete treatment of multi-carrier, spread-spectrum (SS) and time division multiplexing (TDM) techniques * Provides an in-depth insight into hybrid multiple access techniques based on multi-carrier (MC) transmission * Presents numerous hybrid multiple access and air interface architectures including OFDM/CDMA, MC-CDMA, MC-DS-CDMA and MT-CDMA * Covers new techniques such as space-time coding and software radio * Provides detailed solutions to address 5G spectrum requirements while supporting the higher number of users, and achieving higher coverage and throughput are the main advantages of CR-based networks compared to conventional ones. The main goal of this book is to provide highlights of current research topics in the field of CR-based systems. The book consists of six chapters in three sections focusing on primary and secondary users, spectrum sensing, spectrum sharing, CR-based IoT, emulsion attack, and interference alignment.

Cognitive Radio in 4G/5G Wireless Communication Systems-Shahriar Shirvani Moghaddam 2018-12-05 The limitation of the radio spectrum and the rapid growth of communication applications make optimal usage of radio resources essential. Cognitive radio (CR) is an attractive research area for 4G/5G wireless communication systems, which enables unlicensed users to access the spectrum. Delivering higher spectral efficiency, supporting the higher number of users, and achieving higher coverage and throughput are the main advantages of CR-based networks compared to conventional ones. The main goal of this book is to provide highlights of current research topics in the field of CR-based systems. The book consists of six chapters in three sections focusing on primary and secondary users, spectrum sensing, spectrum sharing, CR-based IoT, emulsion attack, and interference alignment.

4G Mobile and Wireless Communications Technologies-Sofoklis Kyriazakos 2008 This text gathers research and development on topics shaping the fourth generation (4G) in mobile and wireless communications and reveals the key trends and enabling technologies for 4G.

High Performance Browser Networking-Ilya Grigorik 2013-09-11 How prepared are you to build fast and efficient web applications? This eloquent book provides what every web developer should know about the network, from fundamental limitations that affect performance to major innovations for building even more powerful browser applications—including HTTP 2.0 and XHR improvements, Server-Sent Events (SSE), WebSocket, and WebRTC. Author Ilya Grigorik, a web performance engineer at Google, demonstrates performance optimization best practices for TCP, UDP, and TLS protocols, and explains how mobile radio connections limit performance and slow optimization requirements. You’ll then dive into performance characteristics of technologies such as HTTP 2.0, client-side network scripting with XHR, real-time streaming with SSE and WebSocket, and P2P communication with WebRTC. Deliver superlative TCP, UDP, and TLS performance Speed up networking performances * A comprehensive book on 4G/4G mobile networks Develop fast and energy-efficient mobile applications Address bottlenecks in HTTP 1.x and other browser protocols Plan for and deliver the best HTTP 2.0 performance Enable efficient real-time streaming in the browser Create efficient peer-to-peer videoconferencing and low-latency applications with real-time WebRTC transports.

LTE Services-Jean-Gabriel Rémy 2014-09-25 LTE (Long Term Evolution) is commonly marketed as 4G. LTE andLTE Advanced have been recognized by ITU-R and ITU-T (InternationalTelecommunications Union – Telecommunications) as the principal solution for the future mobile...
communication and protocols (Diameter, GTP, S1-AP), and includes new coverage of femtocells, SIPTO, LIPA, LTE relay and LTE Advanced. Up-to-date coverage of SAE including the latest standards development Easily accessible overview of the architecture and concepts defined by SAE Through a detailed description of the Evolved Packet Core for LTE, fixed and other wireless accesses Comprehensive explanation of SAE key concepts, security and Quality-of-Service Covers potential service and operator scenarios including interworking with existing 3GPP and 3GPP2 systems Detailed walkthrough of network entities, protocols and procedures Written by established experts in the SAE standardization process, all of whom have extensive experience and understanding of its goals, history and vision.

Wireless Networking Complete - Pei Zheng 2009-08-04 Wireless Networking Complete is a compilation of critical content from key Morgan Kaufmann titles published in recent years on wireless networking and communications. Individual chapters are organized into one complete reference giving a 360-degree view from our bestselling authors. From wireless application protocols, to Mesh Networks and Ad Hoc Sensor Networks, to security and survivability of wireless systems - all of the elements of wireless networking are united in a single volume. The book covers both methods of analysis and problem-solving techniques, enhancing the reader’s grasp of the material and ability to implement practical solutions. This book is essential for anyone interested in new and developing aspects of wireless networking technology. Chapters contributed by recognized experts in the field cover theory and practice of wireless network technology, allowing the reader to develop a new level of knowledge and technical expertise. This comprehensive coverage of key concepts, facilities learning and lets the reader remain current and fully informed from multiple viewpoints. Presenters methods of analysis and problem-solving techniques, enhancing the reader’s grasp of the material and ability to implement practical solutions.

Principles of Mobile Communication - Gordon L. Stüber 2013-03-09 Principles of Mobile Communication provides an authoritative treatment of the fundamentals of mobile communications, one of the fastest growing areas of the modern telecommunications industry. The book stresses the fundamentals of mobile communications engineering that are important for the design of any mobile system. Less emphasis is placed on the description of existing and proposed wireless standards. This focus on fundamental issues should be of benefit not only to students taking formal instruction but also to practising engineers who are likely to already have a detailed familiarity with the standards and are seeking to deepen their knowledge of this important field. The book stresses mathematical modeling and analysis, rather than providing a qualitative overview. It has been specifically developed as a textbook for graduate level instruction and a reference book for practising engineers and those seeking to pursue research in the area. The book contains sufficient background material for the novice, yet enough advanced material for a sequence of graduate level courses. Principals of Mobile Communication treats a variety of contemporary issues, many of which have been treated before only in the journals. Some material in the book has never appeared before in the literature. The book provides an up-to-date treatment of the subject area at a level of detail that is not available in other books. Also, the book is unique in that the whole range of topics covered is not presently available in any other book. Throughout the book, detailed derivations are provided and extensive references to the literature are made. This is of value to the reader wishing to gain detailed knowledge of a particular topic.

An Introduction to LTE LTE, LTE-advanced, SAE, VoLTE and 4G Mobile Communications - Christopher Ian Cox 2007 This second edition introduces new material on LTE advanced, which it is bringing to mobile communications, focusing on LTE standards and architecture, OFDMA, the Full IP Core Network and LTE security.

Mobile Broadband Multimedia Networks - Luis M. Correia 2010-07-26 Mobile Broadband Multimedia Networks: Techniques, Models and Tools for 4G provides the main results of the prestigious and well known European COST 273 research project on the development of next generation mobile and wireless communication systems. Based on the applied research of over 350 participants in academy and industry, this book focuses on the radio aspects of mobile and wireless broadband multimedia communications, by exploring and developing new methods, models, techniques, strategies and tools towards the implementation of 4th generation mobile and wireless communication systems. This complete reference includes topics ranging from transmission and signal processing techniques to antennas and diversity, ultra wide band, MIMO and reference scenarios for radio network simulation and evaluation. This book will be an ideal source of the latest developments in mobile multimedia broadband technologies for researchers, R&D engineers, graduates and engineers in industry implementing simulation models and conducting measurements. Based on the well known and respected research of the COST 273 project ‘Towards Mobile Broadband Multimedia Networks’, whose previous models have been adopted by standardisation bodies such as ITU, ETSI and 3GPP gives methods, techniques, models and tools for developing 4th generation mobile and wireless communication systems. Includes the latest developments of key technologies and methods such as MIMO systems, ultra wide-band and OFDM.

Mobile Communications Systems Development - Rajib Taid 2021-04-26 Provides a thorough introduction to the development, operation, maintenance, and troubleshooting of mobile communication systems. Based on the applied research of the Mobile Communications Systems Development: A Practical Approach for System Understanding, Implementation and Deployment is a comprehensive “how to” manual for mobile communications system design, deployment, and support. Providing a detailed overview of end-to-end system development, the book encompasses operation, maintenance, and troubleshooting of current and next generation mobile communication systems and networks. Readers are introduced to different network architectures, standardization, protocols, and functions including 2G, 3G, 4G, and 5G networks, and the 3GPP standard. In-depth chapters cover the entire protocol stack from the Physical (PHY) to the Application layer, discuss theoretical and practical considerations, and describe software implementation based on the 3GPP standardized technical specifications. The book includes figures, tables, and sample computer code to help readers thoroughly understand the protocols and underlying concepts of a mobile communications network. Each chapter includes an introduction to the topic and a chapter summary. A full list of references, and a set of exercises are also provided at the end of the book to test comprehension and strengthen understanding of the material. Written by a respected professional with more than 20 years’ experience in the field, this highly practical guide: Provides detailed introductory information on GSM, GPRS, UMTS, and LTE mobile communications systems and networks Describes the various aspects and areas of the LTE system air interface and its protocol layer Covers troubleshooting and resolution of mobile communication systems and networks Discusses the software and hardware platforms used for the development of mobile communications networks system elements Includes 5G use cases, enablers, and architectures that cover the 5G NR (New Radio) and 5G Core Network Mobile Communications Systems Development is perfect for graduate and postdoctoral students studying mobile communications and telecom design, electronic engineering undergraduate students in their final year, research and development engineers, and network operation and maintenance personnel.
Inclusive Radio Communications for 5G and Beyond-Claude Casettes 2021-05-17 Inclusive Radio Communication Networks for 5G and Beyond is based on the COST IRACON project that consists of 500 researchers from academia and industry, with 120 institutions from Europe, US and the Far East involved. The book presents state-of-the-art design and analysis methods for 5G (and beyond) radio communication networks, along with key challenges and issues related to the development of 5G networks. Covers the latest research in 5G networks - including 5G, 3GPP, LTE, and IoT radio channels Based on the International COST research project, IRACON, with 120 institutions and 500 researchers from Europe, US and the Far East involved Provides coverage of 10G protocols, architectures and applications, and with IoT applications in healthcare Contains a concluding chapter on future trends in mobile communications and networking

Advanced Wireless Networks-Savo G. Glisic 2006-05-01 The major expectation from the fourth generation (4G) of wireless communication networks is to be able to handle much higher data rates, allowing users to seamlessly reconnect to different networks even within the same session. Advanced Wireless Networks gives readers a comprehensive integral presentation of the main issues in 4G wireless networks, showing the wide scope and inter-relation between different elements of the network. This book adopts a logical approach, beginning each chapter with introductory material, before proceeding to more advanced topics and system analysis. Its presentation of theory and practice makes it ideal for readers working with the technology, or those in the midst of researching the topic. Covers mobile, WLAN, sensor, ad hoc, bio-inspired and cognitive networks as well as discussing cross-layer optimisation, adaptability and reconﬁgurability Includes hot topics such as network management, mobility and hand-offs, adaptive resource management, RoF, and solutions for achieving energy efﬁcient wireless networks Discusses security issues, an essential element of working with wireless networks Supports the advanced university and training courses in the field and includes an extensive list of references Providing comprehensive coverage of the current status of wireless networks and their future, this book is a vital source of information for those involved in the research and development of mobile communications, as well as the industry users playing and selling this technology. Companion website features three appendices: Components of CRE, Introduction to Medium Access Control and Elements of Queueing Theory

The Technology and Business of Mobile Communications-Mythri Hunukumbure 2021-12-03 An intuitive and insightful overview of the technical and business aspects of the telecoms industry In The Technology and Business of Mobile Telecommunications: An Introduction, a team of expert telecoms researchers and practitioners drives a rigorous exploration of the technical and business aspects of mobile telecommunications. The book offers a complete overview of an industry that has seen rapid technical and economic changes while retaining the ability to provide end users with communications coverage and capacity. The authors demonstrate the technical foundations of the mobile industry and show how a communications network is deployed. They detail many of the main innovations introduced over the last few years and some of the most salient challenges facing the industry today. The business models of major mobile operators are examined as well, from the purchasing spectrum to network deployment and customer attraction and retention. The role of the regulator is also thoroughly discussed, with explanations of its role in encouraging the maintenance of a competitive market in which the needs of consumers are met. Readers will also enjoy: Thorough introductions to the social and economic impacts of mobile communications, as well as a brief history of mobile and cellular communications Comprehensive explorations of the mobile telecommunications ecosystem, from spectrum regulation to standardisation, research, end users, operators, vendors, and standard bodies Practical discussions of the business models and challenges of mobile operators, including mobile virtual network operators and the implementation of international roaming In-depth examinations of telecommunication standards, including 5G Perfect for anyone studying mobile telecommunications technology at undergraduate, localisation, and postgraduate levels, The Technology and Business of Mobile Telecommunications: An Introduction is also an indispensable resource for practitioners within the telecommunications industry in a technical or business-oriented role.

Mobile Communications Systems Development-Bajib Taid 2021-06-14 Provides a thorough introduction to the development, operation, maintenance, and troubleshooting of mobile communications systems Mobile Communications Systems Development: A Practical Approach for System Understanding, Implementation and Deployment is a comprehensive "how to" manual for mobile communications system design, deployment, and support. Providing a detailed overview of end-to-end system development, the book encompasses operation, maintenance, and troubleshooting of current and future mobile networking technologies and systems. Readers are introduced to different network architectures, standardisation, protocols, and functions including 2G, 3G, 4G, and 5G networks, and the 3GPP standard. In-depth chapters cover the entire protocol stack from the Physical (PHY) to the Application layer, discussing theoretical and practical considerations, and describe software implementation based on the 3GPP standardised technical specifications. The book includes figures, tables, and sample computer code to help readers thoroughly comprehend the functions and underlying concepts of a mobile communications network. Each chapter includes an introduction to the topic and a chapter summary. A full list of references, and a set of exercises are also provided at the end of the book to test comprehension and strengthen understanding of the material. Written by a respected professional with more than 20 years' experience in the field, this highly practical guide: Provides detailed introductory information on GSM, GPRS, UMTS, and LTE mobile communications systems and networks Describes the various aspects and areas of the LTE system air interface and its protocol layers Covers troubleshooting and resolution of mobile communications systems and networks issues Discusses the software and hardware platforms used for the development of mobile communications systems network elements Includes 5G use cases, enablers, and architectures that cover the 5G NR (New Radio) and 5G Core Network Mobile Communications Systems Development is perfect for graduate and postgraduate students studying mobile communications and telecom design, electronic engineering undergraduate students in their final year, research and development engineers, and network operation and maintenance personnel.

Fundamentals of Cellular Network Planning and Optimisation-Ajay R. Mishra 2004-11-19 *By 2008, some 2 billion people will be using mobile phones and devices, in many cases to access advanced data services. Against this backdrop, the need for efficient and effective network design will be critical to the success of increasingly complex mobile networks.* Simon Beresford-Wylie (SPV, Nokia Networks) With the complexity of the cellular networks increasing day by day, a deeper understanding of the design and performance of end-to-end cellular networks is required. Moreover, all the types of networks from 2G-2.5G-3G seem to co-exist. Fundamentals of Cellular Network Planning and Optimisation covers end-to-end network planning and optimisation aspects from second generation GSM to third generation UMTS and beyond. Covers 5G NR (New Radio) and 5G Core Network. All the sub-systems of the network i.e. radio network, transmission network and core network have been covered with focus on both practical and theoretical issues. By bringing all these concepts under one cover, this book becomes essential reading for the network design engineers working either with cellular service vendors or operators, experienced/academic workers in the mobile communications and telecom design and postgraduate students. Key Highlights: Distinctly divided into four parts: 2G (GSM), 2.5G (GPRS & EDGE), 3G (WCDMA) and introduction to 4G (OFDM, ALL-IP, WLAN Overview) respectively Each part focuses on the radio, transmission and core networks. Concentrates on cellular network planning process and explains the underlying principles behind the planning and optimizing of the cellular networks. The text will serve as a handbook for anyone engaged in the study, design, deployment and business of cellular networks.

LTE Optimization Engineering Handbook-Xincheng Zhang 2018-01-04 A comprehensive resource containing the operating principles and key insights of LTE networks performance optimization LTE Optimization Engineering Handbook is a comprehensive reference that describes the most current technologies and optimization principles for LTE networks. The text offers an introduction to the basics of LTE architecture, services and technologies and includes details on the key principles and methods of LTE optimization and its parameters. In addition, the author clarifies different optimization aspects such as wireless channel optimization, data optimization, CSFB, VoLTE, and video optimization. With the ubiquitous usage and increased development of mobile networks and smart devices, LTE-4G, 5G NR and beyond is the future of our mobile network design. The LTE Optimization Engineering Handbook provides an essential guide that: Discusses the latest optimization engineering technologies of LTE networks and explores the implementation features, and discusses the latest and most industrially relevant applications, such as VoLTE and HetNets Includes a wealth of detailed scenarios and optimization real-world case studies Professionals in the field will find the LTE Optimization Engineering Handbook to be their go-to reference that includes a thorough and complete examination of LTE networks, their operating principles, and
the most current information to performance optimization.