5g Wireless Technology Development Matlab Simulink

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Fundamentals of 5G Mobile Networks - Jonathan Rodriguez 2015-06-22
Fundamentals of 5G Mobile Networks provides an overview of the key features of the 5th Generation (5G) mobile networks, discussing the motivation for 5G and the main challenges in developing this new technology. This book provides an insight into the key areas of research that will define this new system technology paving the path towards future research and development. The book is multi-disciplinary in nature, and aims to cover a whole host of intertwined subjects that will predominantly influence the 5G landscape, including the future Internet, cloud computing, small cells and self-organizing networks (SONs), cooperative communications, dynamic spectrum management and cognitive radio, Broadcast-Broadband convergence , 5G security challenge, and green RF. This book aims to be the first of its kind towards painting a holistic perspective on 5G Mobile, allowing 5G stakeholders to capture key technology trends on different layering domains and to identify potential inter-disciplinary design aspects that need to be solved in order to deliver a 5G Mobile system that operates seamlessly.

The 10th International Conference on Computer Engineering and Networks - Qi Liu 2020-10-05
This book contains a collection of the papers accepted by the CENet2020 – the 10th International Conference on Computer Engineering and Networks held on October 16-18, 2020 in Xi'an, China. The topics focus but are not limited to Internet of Things and Smart Systems, Artificial Intelligence and Applications, Communication System Detection, Analysis and Application, and Medical Engineering and Information Systems. Each part can be used as an excellent reference by industry practitioners, university faculties, research fellows and undergraduates as well as graduate students who need to build a knowledge base of the most current advances and state-of-practice in the topics covered by this conference proceedings. This will enable them to produce, maintain, and manage systems with high levels of trustworthiness and complexity.

5G Wireless Technologies - Angeliki Alexiou 2017-06-08
Mobile data traffic is expected to exceed traffic from wired devices in the next couple of years. This book presents a roadmap of 5G, from advanced radio technologies to innovative resource management approaches and novel network architectures and system concepts.

Millimeter Wave Wireless Communications - Theodore S. Rappaport 2015
The Definitive, Comprehensive Guide to Cutting-Edge Millimeter Wave Wireless Design "This is a great book on mmWave systems that covers many aspects of the technology targeted for beginners all the way to the advanced users. The authors are some of the most credible scholars I know of who are well respected by the industry. I highly recommend studying this book in detail." —Ali Sadri, Ph.D., Sr. Director, Intel Corporation, MCG mmWave Standards and Advanced Technologies Millimeter wave (mmWave) is today's breakthrough frontier for emerging wireless mobile cellular networks, wireless local area networks, personal area networks, and vehicular communications. In the near future, mmWave products, systems, theories, and devices will come together to deliver mobile data rates thousands of times faster than today's existing cellular and WiFi networks. In Millimeter Wave Wireless Communications, four of the field's pioneers draw on their immense experience as researchers, entrepreneurs, inventors, and consultants, empowering engineers at all levels to succeed with mmWave. They deliver exceptionally clear and useful guidance for newcomers, as well as the first complete desk reference for design experts. The authors explain mmWave signal propagation, mmWave circuit design, antenna designs, communication theory, and current standards (including IEEE 802.15.3c, Wireless HD, and ECMA/WiMedia). They cover comprehensive mmWave wireless design issues, for 60 GHz and other mmWave bands, from

channel to antenna to receiver, introducing emerging design techniques that will be invaluable for research engineers in both industry and academia. Topics include Fundamentals: communication theory, channel propagation, circuits, antennas, architectures, capabilities, and applications Digital communication: baseband signal/channel models, modulation, equalization, error control coding, multiple input multiple output (MIMO) principles, and hardware architectures Radio wave propagation characteristics: indoor and outdoor applications Antennas/antenna arrays, including on-chip and in-package antennas, fabrication, and packaging Analog circuit design: mmWave transistors, fabrication, and transceiver design approaches Baseband circuit design: multi–gigabit-per-second, high-fidelity DAC and ADC converters Physical layer: algorithmic choices, design considerations, and impairment solutions; and how to overcome clipping, quantization, and nonlinearity Higher-layer design: beam adaptation protocols, relaying, multimedia transmission, and multiband considerations 60 GHz standardization: IEEE 802.15.3c for WPAN, Wireless HD, ECMA-387, IEEE 802.11ad, Wireless Gigabit Alliance (WiGig)

Communications, Signal Processing, and Systems - Qilian Liang 2018-06-07
This book brings together papers presented at the 2017 International Conference on Communications, Signal Processing, and Systems (ICCSP 2017), which was held on July 14–17, 2017 in Harbin, China. Presenting the latest developments and discussing the interactions and links between these multidisciplinary fields, the book spans topics ranging from communications, signal processing and systems. It is aimed at undergraduate and graduate electrical engineering, computer science and mathematics students, researchers and engineers from academia and industry as well as government employees.

Handbook of Intelligent Computing and Optimization for Sustainable Development - Mukhdeep Singh Manshahia 2022-02-11
HANDBOOK OF INTELLIGENT COMPUTING AND OPTIMIZATION FOR SUSTAINABLE DEVELOPMENT This book provides a comprehensive overview of the latest breakthroughs and recent progress in sustainable intelligent computing technologies, applications, and optimization techniques across various industries. Optimization has received enormous attention along with the rapidly increasing use of communication technology and the development of user-friendly software and artificial intelligence. In almost all human activities, there is a desire to deliver the highest possible results with the least amount of effort. Moreover, optimization is a very well-known area with a vast number of applications, from route finding problems to medical treatment, construction, finance, accounting, engineering, and maintenance schedules in plants. As far as optimization of real-world problems is concerned, understanding the nature of the problem and grouping it in a proper class may help the designer employ proper techniques which can solve the problem efficiently. Many intelligent optimization techniques can find optimal solutions without the use of objective function and are less prone to local conditions. The 41 chapters comprising the Handbook of Intelligent Computing and Optimization for Sustainable Development by subject specialists, represent diverse disciplines such as mathematics and computer science, electrical and electronics engineering, neuroscience and cognitive sciences, medicine, and social sciences, and provide the reader with an integrated understanding of the importance that intelligent computing has in the sustainable development of current societies. It discusses the emerging research exploring the theoretical and practical aspects of successfully implementing new and innovative intelligent techniques in a variety of sectors, including IoT, manufacturing, optimization, and healthcare. Audience It is a pivotal reference source for IT specialists, industry professionals, managers, executives, researchers, scientists, and engineers seeking current research in emerging perspectives in the field of artificial intelligence in

the areas of Internet of Things, renewable energy, optimization, and smart cities.

Signal Processing for 5G - Fa-Long Luo 2016-08-04
A comprehensive and invaluable guide to 5G technology, implementation and practice in one single volume. For all things 5G, this book is a must-read. Signal processing techniques have played the most important role in wireless communications since the second generation of cellular systems. It is anticipated that new techniques employed in 5G wireless networks will not only improve peak service rates significantly, but also enhance capacity, coverage, reliability , low-latency, efficiency, flexibility, compatibility and convergence to meet the increasing demands imposed by applications such as big data, cloud service, machine-to-machine (M2M) and mission-critical communications. This book is a comprehensive and detailed guide to all signal processing techniques employed in 5G wireless networks. Uniquely organized into four categories, New Modulation and Coding, New Spatial Processing, New Spectrum Opportunities and New System-level Enabling Technologies, it covers everything from network architecture, physical-layer (down-link and up-link), protocols and air interface, to cell acquisition, scheduling and rate adaption, access procedures and relaying to spectrum allocations. All technology aspects and major roadmaps of global 5G standard development and deployments are included in the book. Key Features: Offers step-by-step guidance on bringing 5G technology into practice, by applying algorithms and design methodology to real-time circuit implementation, taking into account rapidly growing applications that have multi-standards and multi-systems. Addresses spatial signal processing for 5G, in particular massive multiple-input multiple-output (massive-MIMO), FD-MIMO and 3D-MIMO along with orbital angular momentum multiplexing, 3D beamforming and diversity. Provides detailed algorithms and implementations, and compares all multicarrier modulation and multiple access schemes that offer superior data transmission performance including FBMC, GFDM, F-OFDM, UFMC, SEFDM, FTN, MUSA, SCMA and NOMA. Demonstrates the translation of signal processing theories into practical solutions for new spectrum opportunities in terms of millimeter wave, full-duplex transmission and license assisted access. Presents well-designed implementation examples, from individual function block to system level for effective and accurate learning. Covers signal processing aspects of emerging system and network architectures, including ultra-dense networks (UDN), software-defined networks (SDN), device-to-device (D2D) communications and cloud radio access network (C-RAN).

5G Networks - Anwer Al-Dulaimi 2018-09-11
A reliable and focused treatment of the emergent technology of fifth generation (5G) networks This book provides an understanding of the most recent developments in 5G, from both theoretical and industrial perspectives. It identifies and discusses technical challenges and recent results related to improving capacity and spectral efficiency on the radio interface side, and operations management on the core network side. It covers both existing network technologies and those currently in development in three major areas of 5G: spectrum extension, spatial spectrum utilization, and core network and network topology management. It explores new spectrum opportunities; the capability of radio access technology; and the operation of network infrastructure and heterogeneous QoE provisioning. 5G Networks: Fundamental Requirements, Enabling Technologies, and Operations Management is split into five sections: Physical Layer for 5G Radio Interface Technologies; Radio Access Technology for 5G Networks; 5G Network Interworking and Core Network Advancements; Vertical 5G Applications; and R&D and 5G Standardization. It starts by introducing emerging technologies in 5G software, hardware, and management aspects before moving on to cover waveform design for 5G and beyond; code design for multi-user MIMO; network slicing for 5G networks; machine type communication in the 5G era; provisioning unlicensed LAA interface for smart grid applications; moving toward all-IT 5G end-to-end infrastructure; and more. This valuable resource: Provides a comprehensive reference for all layers of 5G networks Focuses on fundamental issues in an easy language that is understandable by a wide audience Includes both beginner and advanced examples at the end of each section Features sections on major open research challenges 5G Networks: Fundamental Requirements, Enabling Technologies, and Operations Management is an excellent book for graduate students, academic researchers, and industry professionals, involved in 5G technology.

Evolutionary Computing and Mobile Sustainable Networks - V. Suma 2022
This book mainly reflects the recent research works in evolutionary computation technologies and mobile sustainable networks with a specific focus on computational intelligence and communication technologies that widely ranges from theoretical foundations to practical applications in enhancing the sustainability of mobile networks. Today, network sustainability has become a significant research domain in both academia and industries present across the globe. Also, the network sustainability paradigm has generated a solution for existing optimization challenges in mobile communication networks. Recently, the research advances in evolutionary computing technologies including swarm intelligence algorithms and other evolutionary algorithm paradigms are considered as the widely accepted descriptors for mobile sustainable networks virtualization, optimization, and automation. To deal with the emerging impacts on mobile communication networks, this book discusses about the state-of-the research works on developing a sustainable design and their implementation in mobile networks. With the advent of evolutionary computation algorithms, this book contributes varied research chapters to develop a new perspective on mobile sustainable networks.

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

Wireless Network Simulation - Henry Zárate Ceballos 2021-05-11
Learn to run your own simulation by working with model analysis, mathematical background, simulation output data, and most importantly, a network simulator for wireless technology. This book introduces the best practices of simulator use, the techniques for analyzing simulations with artificial agents and the integration with other technologies such as Power Line Communications (PLC). Network simulation is a key technique used to test the future behavior of a network. It's a vital development component for the development of 5G, IoT, wireless sensor networks, and many more. This book explains the scope and evolution of the technology that has led to the development of dynamic systems such as Internet of Things and fog computing. You'll focus on the ad hoc networks with stochastic behavior and dynamic nature, and the ns-3 simulator. These are useful open source tools for academics, researchers, students and engineers to deploy telecommunications experiments, proofs and new scenarios with a high degree of similarity with reality. You'll also benefit from a detailed explanation of the examples and the theoretical components needed to deploy wireless simulations or wired, if necessary. What You'll Learn Review best practices of simulator uses Understand techniques for analyzing simulations with artificial agents Apply simulation techniques and experiment design Program on ns-3 simulator Analyze simulation results Create new modules or protocols for wired and wireless networks Who This Book Is For Undergraduate and postgraduate students, researchers and professors interested in network simulations. This book also includes theoretical components about

simulation, which are useful for those interested in discrete event simulation DES, general theory of simulation, wireless simulation and ns-3 simulator.

Handbook of Research on Developing a Post-Pandemic Paradigm for Virtual Technologies in Higher Education - Loureiro, Sandra Maria Correia 2021-06-25
The COVID-19 pandemic has forced companies, institutions, citizens, and students to rapidly change their behaviors and use virtual technologies to perform their usual working tasks. Though virtual technologies for learning were already present in most universities, the pandemic has forced virtual technologies to lead the way in order to continue teaching and learning for students and faculty around the world. Universities and teachers had to quickly adjust everything from their curriculum to their teaching styles in order to adapt to an online learning environment. Online learning is a complex issue and one that comes with both challenges and opportunities; there is plenty of room for growth, and further study is required to better understand how to improve online education. The Handbook of Research on Developing a Post-Pandemic Paradigm for Virtual Technologies in Higher Education is a comprehensive reference book that presents the testimonials of teachers and students with various degrees of experience with distance learning and their utilization of current virtual tools and applications for learning, as well as the impact of these technologies and their potential future use. With topics ranging from designing an online learning course to discussing group work in an online environment, this book is ideal for teachers, educational software developers, IT consultants, instructional designers, administrators, professors, researchers, lecturers, students, and all those who are interested in learning more about distance learning and all the positive and negative aspects that accompany it.

5G Wireless Systems - Yang Yang 2017-09-14
This book focuses on key simulation and evaluation technologies for 5G systems. Based on the most recent research results from academia and industry, it describes the evaluation methodologies in depth for network and physical layer technologies. The evaluation methods are discussed in depth. It also covers the analysis of the 5G candidate technologies and the testing challenges, the evolution of the testing technologies, fading channel measurement and modeling, software simulations, software hardware cosimulation, field testing and other novel evaluation methods. The fifth-generation (5G) mobile communications system targets highly improved network performances in terms of the network capacity and the number of connections. Testing and evaluation technologies is widely recognized and plays important roles in the wireless technology developments, along with the research on basic theory and key technologies. The investigation and developments on the multi-level and comprehensive evaluations for 5G new technologies, provides important performance references for the 5G technology filtering and future standardizations. Students focused on telecommunications, electronic engineering, computer science or other related disciplines will find this book useful as a secondary text. Researchers and professionals working within these related fields will also find this book useful as a reference.

Information and Communication Technologies for Development. Strengthening Southern-Driven Cooperation as a Catalyst for ICT4D - Petter Nielsen 2019-04-25
The two volumes IFIP AICT 551 and 552 constitute the refereed proceedings of the 15th IFIP WG 9.4 International Conference on Social Implications of Computers in Developing Countries, ICT4D 2019, held in Dar es Salaam, Tanzania, in May 2019. The 97 revised full papers and 2 short papers presented were carefully reviewed and selected from 185 submissions. The papers present a wide range of perspectives and disciplines including (but not limited to) public administration, entrepreneurship, business administration, information technology for development, information management systems, organization studies, philosophy, and management. They are organized in the following topical sections: communities, ICT-enabled networks, and development; digital platforms for development; ICT for displaced population and refugees. How it helps? How it hurts?; ICT4D for the indigenous, by the indigenous and of the indigenous; local technical papers; pushing the boundaries - new research methods, theory and philosophy in ICT4D; southern-driven human-computer interaction; sustainable ICT, informatics, education and learning in a turbulent world - "doing the safari way".

Inclusive Radio Communications for 5G and Beyond - Claude Oestges 2021-05-18
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 on 5G networks – including propagation, localization, IoT and 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 IoT protocols, architectures and applications, along with IoT applications in healthcare Contains a concluding chapter on future trends in mobile communications and networking

Proceedings of First International Conference on Computational Electronics for Wireless Communications - Sanyog Rawat 2022-01-03
This book includes high-quality papers presented at Proceedings of First International Conference on Computational Electronics for Wireless Communications (ICCWC 2021), held at National Institute of Technology, Kurukshetra, Haryana, India, during June 11–12, 2021. The book presents original research work of academics and industry professionals to exchange their knowledge of the state-of-the-art research and development in computational electronics with an emphasis on wireless communications. The topics covered in the book are radio frequency and microwave, signal processing, microelectronics and wireless networks.

Proceedings of 2021 International Conference on Autonomous Unmanned Systems (ICAUS 2021) - Meiping Wu 2022
This book includes original, peer-reviewed research papers from the ICAUS 2021, which offers a unique and interesting platform for scientists, engineers and practitioners throughout the world to present and share their most recent research and innovative ideas. The aim of the ICAUS 2021 is to stimulate researchers active in the areas pertinent to intelligent unmanned systems. The topics covered include but are not limited to Unmanned Aerial/Ground/Surface/Underwater Systems, Robotic, Autonomous Control/Navigation and Positioning/ Architecture, Energy and Task Planning and Effectiveness Evaluation Technologies, Artificial Intelligence Algorithm/Bionic Technology and Its Application in Unmanned Systems. The papers showcased here share the latest findings on Unmanned Systems, Robotics, Automation, Intelligent Systems, Control Systems, Integrated Networks, Modeling and Simulation. It makes the book a valuable asset for researchers, engineers, and university students alike.

OPNET IoT Simulation - Min Chen 2019-09-17
This is the first book offering an in-depth and comprehensive IoT network simulation, supported by OPNET tool. Furthermore, the book presents the simulations of IoT in general, not limited by OPNET. The authors provide rich OPNET IoT simulation codes, with detailed explanation regarding the functionalities of the model. These codes can facilitate readers' fast implementation, and the shared model can guide readers through developing their own research. This book addresses various versions of Internet of Things (IoT), including human-centric IoT, green IoT, Narrow band IoT, Smart IoT, IoT-Cloud integration. The introduced OPNET IoT simulation provides a comprehensive platform to simulate above-mentioned IoT systems. Besides, this book introduces OPNET semi-physical simulation in detail. Based on this technology, simulated IoT and practical cloud are seamlessly connected with each other. On top of this "IoT-cloud-integration" semi-physical simulation environment, various smart IoT applications can be realized.

5G System Design - Wan Lei 2019-09-09
This book presents a detailed pedagogical description of the 5G commercial wireless communication system design, from an end to end perspective. It compares and contrasts NR with LTE, and gives a concise and highly accessible description of the key technologies in the 5G physical layer, radio access network layer protocols and procedures. This book also illustrates how the 5G core and EPC is integrated into the radio access network, how virtualization and edge computer fundamentally change the way users interact with the network, as well as 5G spectrum issues. This book is structured into six chapters. The first chapter reviews the use cases, requirements, and standardization organization and activities for 5G. These are 5G requirements and not NR specifically, as technology that meets the requirements, may be submitted to the ITU as 5G technology. This includes a set of Radio Access Technologies (RATs), consisting of NR and LTE; with each RAT meeting different aspects of the requirements. The second chapter describes the air interface of NR and LTE side by side. The basic aspects of LTE that NR builds upon are first described, followed by sections on the NR specific technologies, such as carrier/channel, spectrum/duplexing (including SUL), LTE/NR co-existence and new physical layer technologies (including waveform, Polar/LDPC codes,

MIMO, and URLLC/mMTC). In all cases the enhancements made relative to LTE are made apparent. The third chapter contains descriptions of NR procedures (IAM/Beam Management/Power control/HARQ), protocols (CP/UP/mobility, including grant-free), and RAN architecture. The fourth chapter includes a detailed discussion related to end-to-end system architecture, and the 5G Core (5GC), network slicing, service continuity, relation to EPC, network virtualization, and edge computing. The fifth and major chapter describes the ITU submission and how NR and LTE meet the 5G requirements in significant detail, from the rapporteur responsible for leading the preparation and evaluation, as well as some field trial results. Engineers, computer scientists and professionals with a passing knowledge of 4G LTE and a comprehensive understanding of the end to end 5G commercial wireless system will find this book to be a valuable asset. Advanced-level students and researchers studying and working in communication engineering, who want to gain an understanding of the 5G system (as well as methodologies to evaluate features and technologies intended to supplement 5G) will also find this book to be a valuable resource.

Understanding LTE with MATLAB - Houman Zarrinkoub 2014-01-28
An introduction to technical details related to the PhysicalLayer of the LTE standard with MATLAB® The LTE (Long Term Evolution) and LTE-Advanced are among thelatest mobile communications standards, designed to realize thedream of a truly global, fast, all-IP-based, secure broadbandmobile access technology. This book examines the Physical Layer (PHY) of the LTE standardsby incorporating three conceptual elements: an overview of thetheory behind key enabling technologies; a concise discussionregarding standard specifications; and the MATLAB® algorithmsneeded to simulate the standard. The use of MATLAB®, a widely used technical computinglanguage, is one of the distinguishing features of this book.Through a series of MATLAB® programs, the author explores eachof the enabling technologies, pedagogically synthesizes an LTE PHYsystem model, and evaluates system performance at each stage.Following this step-by-step process, readers will achieve deeperunderstanding of LTE concepts and specifications throughsimulations. Key Features: • Accessible, intuitive, and progressive; one of the fewbooks to focus primarily on the modeling, simulation, andimplementation of the LTE PHY standard • Includes case studies and testbenches in MATLAB®,which build knowledge gradually and incrementally until afunctional specification for the LTE PHY is attained • Accompanying Web site includes all MATLAB® programs,together with PowerPoint slides and other illustrative examples Dr Houman Zarrinkoub has served as a development manager andnow as a senior product manager with MathWorks, based inMassachusetts, USA. Within his 12 years at MathWorks, he has beenresponsible for multiple signal processing and communicationssoftware tools. Prior to MathWorks, he was a research scientist inthe Wireless Group at Nortel Networks, where he contributed tomultiple standardization projects for 3G mobile technologies. Hehas been awarded multiple patents on topics related to computersimulations. He holds a BSc degree in Electrical Engineering fromMcGill University and MSc and PhD degrees in Telecommunicationsfrom the Institut Nationale de la Recherche Scientifique, inCanada.
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High-Performance Modelling and Simulation for Big Data Applications - Joanna Kołodziej 2019-03-25
This open access book was prepared as a Final Publication of the COST Action IC1406 "High-Performance Modelling and Simulation for Big Data Applications (cHiPSet)" project. Long considered important pillars of the scientific method, Modelling and Simulation have evolved from traditional discrete numerical methods to complex data-intensive continuous analytical optimisations. Resolution, scale, and accuracy have become essential to predict and analyse natural and complex systems in science and engineering. When their level of abstraction raises to have a better discernment of the domain at hand, their representation gets increasingly demanding for computational and data resources. On the other hand, High Performance Computing typically entails the effective use of parallel and distributed processing units coupled with efficient storage, communication and visualisation systems to underpin complex data-intensive applications in distinct scientific and technical domains. It is then arguably required to have a seamless interaction of High Performance Computing with Modelling and Simulation in order to store, compute, analyse, and visualise large data sets in science and engineering. Funded by the European Commission, cHiPSet has provided a dynamic trans-European forum for their members and distinguished

guests to openly discuss novel perspectives and topics of interests for these two communities. This cHiPSet compendium presents a set of selected case studies related to healthcare, biological data, computational advertising, multimedia, finance, bioinformatics, and telecommunications.

Artificial Intelligence for Signal Processing and Wireless Communication - Abhinav Sharma 2022-04-04
This book focuses on artificial intelligence in the field of digital signal processing and wireless communication. The implementation of machine learning and deep learning in audio, image, and video processing is presented, while adaptive signal processing and biomedical signal processing are also explored through DL algorithms, as well as 5G and green communication. Finally, metaheuristic algorithms of related mathematical problems are explored.

Modeling, Design and Simulation of Systems - Mohamed Sultan Mohamed Ali 2017-08-24
This two-volume set CCIS 751 and CCIS 752 constitutes the proceedings of the 17th Asia Simulation Conference, AsiaSim 2017, held in Malacca, Malaysia, in August/September 2017. The 124 revised full papers presented in this two-volume set were carefully reviewed and selected from 267 submissions. The papers contained in these proceedings address challenging issues in modeling and simulation in various fields such as embedded systems; symbiotic simulation; agent-based simulation; parallel and distributed simulation; high performance computing; biomedical engineering; big data; energy, society and economics; medical processes; simulation language and software; visualization; virtual reality; modeling and Simulation for IoT; machine learning; as well as the fundamentals and applications of computing.

Wireless Algorithms, Systems, and Applications - Dongxiao Yu 2020-09-08
The two-volume set LNCS 12385 + 12386 constitutes the proceedings of the 15th International Conference on Wireless Algorithms, Systems, and Applications, WASA 2020, which was held during September 13-15, 2020. The conference was planned to take place in Qingdao, China; due to the COVID-19 pandemic it was held virtually. The 67 full and 14 short papers presented in these proceedings were carefully reviewed and selected from 216 submissions. The papers focus on data path algorithms; control path algorithms; network protocol design; network security; network services; and cloud computing.

Advances in Design, Simulation and Manufacturing III - Vitalii Ivanov 2020-06-04
This book reports on topics at the interface between manufacturing and materials engineering, with a special emphasis on design and simulation issues. Specifically, it covers the development of CAx technologies for product design, the implementation of smart manufacturing systems and Industry 4.0 strategies, topics in technological assurance, numerical simulation and experimental studies on cutting, milling, grinding, pressing and profiling processes, as well as the development and implementation of new advanced materials. Based on the 3rd International Conference on Design, Simulation, Manufacturing: The Innovation Exchange (DSMIE-2020), held on June 9-12, 2020 in Kharkiv, Ukraine, this first volume in a two-volume set provides academics and professionals with extensive information on the latest trends, technologies, challenges and practice-oriented lessons learned in the above-mentioned areas.

Networks of the Future - Mahmoud Elkhodr 2017-10-16
With the ubiquitous diffusion of the IoT, Cloud Computing, 5G and other evolved wireless technologies into our daily lives, the world will see the Internet of the future expand ever more quickly. Driving the progress of communications and connectivity are mobile and wireless technologies, including traditional WLANs technologies and low, ultra-power, short and long-range technologies. These technologies facilitate the communication among the growing number of connected devices, leading to the generation of huge volumes of data. Processing and analysis of such "big data" brings about many opportunities, as well as many challenges, such as those relating to efficient power consumptions, security, privacy, management, and quality of service. This book is about the technologies, opportunities and challenges that can drive and shape the networks of the future. Written by established international researchers and experts, Networks of the Future answers fundamental and pressing research challenges in the field, including architectural shifts, concepts, mitigation solutions and techniques, and key technologies in the areas of networking. The book starts with a discussion on Cognitive Radio (CR) technologies as promising solutions for improving spectrum utilization, and also highlights the advances in

CR spectrum sensing techniques and resource management methods. The second part of the book presents the latest developments and research in the areas of 5G technologies and Software Defined Networks (SDN). Solutions to the most pressing challenges facing the adoption of 5G technologies are also covered, and the new paradigm known as Fog Computing is examined in the context of 5G networks. The focus next shifts to efficient solutions for future heterogeneous networks. It consists of a collection of chapters that discuss self-healing solutions, dealing with Network Virtualization, QoS in heterogeneous networks, and energy efficient techniques for Passive Optical Networks and Wireless Sensor Networks. Finally, the areas of IoT and Big Data are discussed, including the latest developments and future perspectives of Big Data and the IoT paradigms.

5G for Future Wireless Networks - Keping Long 2017-12-31
This book constitutes the proceedings of the First International Conference on 5G for Future Wireless Networks, 5GWN 2017, held in Beijing, China, in April 2017. The 64 full papers were selected from 135 submissions and present the state of the art and practical applications of 5G technologies. The exponentially growing data traffic caused by the development of mobile Internet and smart phones requires powerful networks. The fifth generation (5G) techniques are promising to meet the requirements of this explosive data traffic in future mobile communications.

Multiple Access Technologies for 5G - Jie Zeng 2021-05-25
Starting with an overview of current research progresses on multiple access technology, the book then presents the theoretical fundamentals, technical principles, transmission scheme, key technologies and evaluation results of new multi-access technologies, especially focusing on its typical applications 5G communication systems. With extensive practical cases, it is an essential reference for researchers, engineers and graduate students.

Handbook of Research on 5G Networks and Advancements in Computing, Electronics, and Electrical Engineering - Nwajana, Augustine O. 2021-06-25
The advent of the emerging fifth generation (5G) networks has changed the paradigm of how computing, electronics, and electrical (CEE) systems are interconnected. CEE devices and systems, with the help of the 5G technology, can now be seamlessly linked in a way that is rapidly turning the globe into a digital world. Smart cities and internet of things have come to stay but not without some challenges, which must be discussed. The Handbook of Research on 5G Networks and Advancements in Computing, Electronics, and Electrical Engineering focuses on current technological innovations as the world rapidly heads towards becoming a global smart city. It covers important topics such as power systems, electrical engineering, mobile communications, network security, and more. This book examines vast types of technologies and their roles in society with a focus on how each works, the impacts it has, and the future for developing a global smart city. This book is ideal for both industrial and academic researchers, scientists, engineers, educators, practitioners, developers, policymakers, scholars, and students interested in 5G technology and the future of engineering, computing, and technology in human society.

Advances in Simulation and Process Modelling - Yupeng Li 2021-04-05
This book gathers the selected papers from the Second International Symposium on Simulation and Process Modelling (ISSPM 2020), which was held online on August 29-30, 2020, due to COVID-19 pandemic. The Symposium provides a forum in virtual presentation for scholars, researchers and practitioners who are interested in the modelling and simulation of business processes, production and industrial processes, service and administrative processes, and public sector processes to develop theory and practice of simulation and process modelling.

5G Physical Layer - Ali Zaidi 2018-09-22
5G Physical Layer: Principles, Models and Technology Components explains fundamental physical layer design principles, models and components for the 5G new radio access technology – 5G New Radio (NR). The physical layer models include radio wave propagation and hardware impairments for the full range of frequencies considered for the 5G NR (up to 100 GHz). The physical layer technologies include flexible multi-carrier waveforms, advanced multi-antenna solutions, and channel coding schemes for a wide range of services, deployments, and frequencies envisioned for 5G and beyond. A MATLAB-based link level simulator is included to explore various design options. 5G Physical Layer is very suitable for wireless system designers and researchers: basic understanding of communication theory and signal processing is assumed, but familiarity with 4G and 5G standards is not required. With

this book the reader will learn: The fundamentals of the 5G NR physical layer (waveform, modulation, numerology, channel codes, and multi-antenna schemes). Why certain PHY technologies have been adopted for the 5G NR. The fundamental physical limitations imposed by radio wave propagation and hardware impairments. How the fundamental 5G NR physical layer functionalities (e.g., parameters/methods/schemes) should be realized. The content includes: A global view of 5G development – concept, standardization, spectrum allocation, use cases and requirements, trials, and future commercial deployments. The fundamentals behind the 5G NR physical layer specification in 3GPP. Radio wave propagation and channel modeling for 5G and beyond. Modeling of hardware impairments for future base stations and devices. Flexible multi-carrier waveforms, multi-antenna solutions, and channel coding schemes for 5G and beyond. A simulator including hardware impairments, radio propagation, and various waveforms. Ali Zaidi is a strategic product manager at Ericsson, Sweden. Fredrik Athley is a senior researcher at Ericsson, Sweden. Jonas Medbo and Ulf Gustavsson are senior specialists at Ericsson, Sweden. Xiaoming Chen is a professor at Xi'an Jiaotong University, China. Giuseppe Durisi is a professor at Chalmers University of Technology, Sweden, and a guest researcher at Ericsson, Sweden.

Fundamental and Supportive Technologies for 5G Mobile Networks - El-Kader, Sherine Mohamed Abd 2019-11-29
Mobile wireless communication systems have affected every aspect of life. By providing seamless connectivity, these systems enable almost all the smart devices in the world to communicate with high speed throughput and extremely low latency. The next generation of cellular mobile communications, 5G, aims to support the tremendous growth of interconnected things/devices (i.e., internet of things [IoT]) using the current technologies and extending them to be used in higher frequencies to cope with the huge number of different devices. In addition, 5G will provide massive capacity, high throughput, lower end-to-end delay, green communication, cost reduction, and extended coverage area. Fundamental and Supportive Technologies for 5G Mobile Networks provides detailed research on technologies used in 5G, their benefits, practical designs, and recent challenges and focuses on future applications that could exploit 5G network benefits. The content within this publication examines cellular communication, data transmission, and high-speed communication. It is designed for network analysts, IT specialists, industry professionals, software engineers, researchers, academicians, students, and scientists.

Opportunities in 5G Networks - Fei Hu 2016-03-30
Opportunities in 5G Networks: A Research and Development Perspective uniquely focuses on the R&D technical design of 5th-generation (5G) networks. It is written and edited by researchers and engineers who are world-renown experts in the design of 5G networks. The book consists of four sections: The first section explains what 5G is, what its re

The Military Balance 2022 - The International Institute for Strategic Studies (IISS) 2022-02-14
Published each year since 1959, The Military Balance is an indispensable reference to the capabilities of armed forces across the globe. It is used by academia, the media, armed forces, the private sector and government. It is an open-source assessment of the military forces and equipment inventories of 171 countries, with accompanying defence economics and procurement data. Alongside detailed country data, The Military Balance assesses important defence issues, by region, as well as key global trends, such as in defence technology and equipment modernisation. This analysis is accompanied by full-colour graphics, including maps and illustrations. With extensive explanatory notes and reference information, The Military Balance is as straightforward to use as it is extensive. The 2022 edition is accompanied by a fullcolour wall chart illustrating security dynamics in the Arctic.

Wireless Communication with Artificial Intelligence - Anuj Singal 2022-09-16
This reference text discusses advances in wireless communication, design challenges, and future research directions to design reliable wireless communication. The text discusses emerging technologies including wireless sensor networks, Internet of Things (IoT), cloud computing, mm-Wave, Massive MIMO, cognitive radios (CR), visible light communication (VLC), wireless optical communication, signal processing, and channel modeling. The text covers artificial intelligence-based applications in wireless communication, machine learning techniques and challenges in wireless sensor networks, and deep learning for channel and bandwidth estimation during optical wireless communication. The text will be useful for senior undergraduate,

graduate students, and professionals in the fields of electrical engineering, and electronics and communication engineering.

Space Information Networks - Quan Yu 2019-01-23
This book constitutes the proceedings of the Third International Conference on Space Information Networks, SINC 2018, held in Changchun, China, in August 2018. The 17 full and 7 short papers presented in this volume were carefully reviewed and selected from 140 submissions. The papers are organized in topical sections on architecture and efficient networking mechanism; theories and methods of high speed transmission; and sparse characterization and fusion processing.

Towards 5G - Rath Vannithamby 2017-01-30
This book brings together a group of visionaries and technical experts from academia to industry to discuss the applications and technologies that will comprise the next set of cellular advancements (5G). In particular, the authors explore usages for future 5G communications, key metrics for these usages with their target requirements, and network architectures and enabling technologies to meet 5G requirements. The objective is to provide a comprehensive guide on the emerging trends in mobile applications, and the challenges of supporting such applications with 4G technologies.

Modeling and Simulation of Computer Networks and Systems - Mohammad S. Obaidat 2015-04-21
Modeling and Simulation of Computer Networks and Systems: Methodologies and Applications introduces you to a broad array of modeling and simulation issues related to computer networks and systems. It focuses on the theories, tools, applications and uses of modeling and simulation in order to effectively optimize networks. It describes methodologies for modeling and simulation of new generations of wireless and mobiles networks and cloud and grid computing systems. Drawing upon years of practical experience and using numerous examples and illustrative applications recognized experts in both academia and industry, discuss: Important and emerging topics in computer networks and systems including but not limited to; modeling, simulation, analysis and security of wireless and mobiles networks especially as they relate to next generation wireless networks Methodologies, strategies and tools, and strategies needed to build computer networks and systems modeling and simulation from the bottom up Different network performance metrics including, mobility, congestion, quality of service, security and more... Modeling and Simulation of Computer Networks and Systems is a must have resource for network architects, engineers and researchers who want to gain insight into optimizing network performance through the use of modeling and simulation. Discusses important and emerging topics in computer networks and Systems including but not limited to; modeling, simulation, analysis and security of wireless and mobiles networks especially as they relate to next generation wireless networks Provides the necessary methodologies, strategies and tools needed to build computer networks and systems modeling and simulation from the bottom up Includes comprehensive review and evaluation of simulation tools and methodologies and different network performance metrics including mobility, congestion, quality of service, security and more

Public Safety Networks from LTE to 5G - Abdulrahman Yarali 2019-12-16
This timely book provides an overview of technologies for Public Safety Networks (PSNs). Including real-life examples of network application and services, it introduces readers to the many public safety network technologies and covers the historical developments as well as emerging trends in PSNs such as today's 4G and tomorrow's 5G cellular network related solutions. 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 introducing broadband data services into safer communication. Topics covered include: TETRA and TETRAPOL; Digital Mobile Radio (DMR), Next-Generation Digital Narrowband (NXDN), Digital Private Mobile Radio (dPMR); and Professional Digital Trunking (PDT). The book also presents information on FirstNet, ESN, and Safenet; Satellite Communications in EMS (Emergency Management) and Public Protection and Disaster Relief (PPDR); Wi-Fi in Ambulances; Technology in Patrol Communications; and more.

5G Mobile and Wireless Communications Technology - Afif Osseiran 2016-06-02
A comprehensive overview of the 5G landscape covering technology options, most likely use cases and potential system architectures.