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*Recent Trends in Communication Networks* - Pinaki Mitra 2020-08-26  
In recent years there has been many developments in communication technology. This has greatly enhanced the computing power of small handheld resource-constrained mobile devices. Different generations of communication technology have evolved. This had led to new research for communication of large volumes of data in different transmission media and the design of different communication protocols. Another direction of research concerns the secure and error-free communication between the sender and receiver despite the risk of the presence of an eavesdropper. For the communication requirement of a huge amount of multimedia streaming data, a lot of research has been carried out in the design of proper overlay networks. The book addresses new research techniques that have evolved to handle these challenges.

## **Intelligent Systems for Optical Networks Design: Advancing Techniques** - Kavian, Yousef S. 2013-03-31

As the increased demand for high-speed communication creates an interest in the development of optical networks, intelligent all optical networks have emerged as the next generation for reliable and fast connections. *Intelligent Systems for Optical Networks Design: Advancing Techniques* is a comprehensive collection of research focused on theoretical and practical aspects of intelligent methodologies as applied to real world problems. This reference source is useful for research and development engineers, scholars, and students interested in the latest development in the area of intelligent systems for optical networks design.

*OFDM and MC-CDMA for Broadband Multi-User Communications, WLANs and Broadcasting* - Lajos Hanzo 2005-01-28

Orthogonal frequency-division multiplexing (OFDM) is a method of digital modulation in which a signal is split into several narrowband channels at different frequencies. CDMA is a form of multiplexing, which allows numerous signals to occupy a single transmission channel, optimising the use of available bandwidth. Multiplexing is sending multiple signals or streams of information on a carrier at the same time in the form of a single, complex signal and then recovering the separate signals at the receiving end. Multi-Carrier (MC) CDMA is a combined technique of Direct Sequence (DS) CDMA (Code Division Multiple Access) and OFDM techniques. It applies spreading sequences in the frequency domain. Wireless communications has witnessed a tremendous growth during the past decade and further spectacular enabling technology advances are expected in an effort to render ubiquitous wireless connectivity a reality. This technical in-depth book is unique in its detailed exposure of OFDM, MIMO-OFDM and MC-CDMA. A further attraction of the joint treatment of these topics is that it allows the reader to view their design trade-offs in a comparative context. Divided into three main parts: Part I provides a detailed exposure of OFDM designed for employment in various applications Part II is another design alternative applicable in the context of OFDM systems where the channel quality fluctuations observed are averaged out with the aid of frequency-domain spreading codes, which leads to the concept of MC-CDMA Part III discusses how to employ multiple antennas at the base station for the sake of supporting multiple users in the uplink Portrays the entire body of knowledge currently available on OFDM Provides the first complete treatment of OFDM, MIMO(Multiple Input Multiple Output)-OFDM and MC-CDMA Considers the benefits of channel coding and space time coding in the context of various application examples and features numerous complete system design examples Converts the lessons of Shannon's information theory into design principles applicable to practical wireless systems Combines the benefits of a textbook with a research monograph where the depth of discussions progressively increase throughout the book This all-encompassing self-contained treatment will appeal to researchers, postgraduate students and academics, practising research and development engineers working for

wireless communications and computer networking companies and senior undergraduate students and technical managers.

*Proceedings of International Conference on Artificial Intelligence, Smart Grid and Smart City Applications* - L. Ashok Kumar 2020-03-12

Due to the complexity, and heterogeneity of the smart grid and the high volume of information to be processed, artificial intelligence techniques and computational intelligence appear to be some of the enabling technologies for its future development and success. The theme of the book is "Making pathway for the grid of future" with the emphasis on trends in Smart Grid, renewable interconnection issues, planning-operation-control and reliability of grid, real time monitoring and protection, market, distributed generation and power distribution issues, power electronics applications, computer-IT and signal processing applications, power apparatus, power engineering education and industry-institute collaboration. The primary objective of the book is to review the current state of the art of the most relevant artificial intelligence techniques applied to the different issues that arise in the smart grid development.

*Wireless Optical Communication Systems* - Steve Hranilovic 2006-01-16

This volume addresses the problem of designing efficient signalling and provides a link between the areas of communication theory and modem design for amplitude constrained linear optical intensity channel. It provides practical guidelines for the design of signalling sets for wireless optical intensity channels.

*Advanced Optical Wireless Communication Systems* - Shlomi Arnon 2012-05-24

Combines theory with real-world case studies to give a comprehensive overview of modern optical wireless technology.

*Optical Wireless Communications* - Murat Uysal 2016-08-25

This book focuses on optical wireless communications (OWC), an emerging technology with huge potential for the provision of pervasive and reliable next-generation communications networks. It shows how the development of novel and efficient wireless technologies can contribute to a range of transmission links essential for the heterogeneous networks of the future to support various communications services and traffic patterns with ever-increasing demands for higher data-transfer rates. The book starts with a chapter reviewing the OWC field, which explains different sub-technologies (visible-light, ultraviolet (UV) and infrared (IR) communications) and introduces the spectrum of application areas (indoor, vehicular, terrestrial, underwater, intersatellite, deep space, etc.). This provides readers with the necessary background information to understand the specialist material in the main body of the book, which is in four parts. The first of these deals with propagation modelling and channel characterization of OWC channels at different spectral bands and with different applications. The second starts by providing a unified information-theoretic treatment of OWC and then discusses advanced physical-layer methodologies (including, but not limited to: advanced coding, modulation diversity, cooperation and multi-carrier techniques) and the ultimate limitations imposed by practical constraints. On top of the physical layer come the upper-layer protocols and cross-layer designs that are the subject of the third part of the book. The last part of the book features a chapter-by-chapter assessment of selected OWC applications. *Optical Wireless Communications* is a valuable reference guide for academic researchers and practitioners concerned with the future development of the world's communication networks. It succinctly but comprehensively presents the latest advances in the field.

*Visible Light Communications* - Zhaocheng Wang 2017-11-03

A complete and comprehensive reference on modulation and signal processing for visible light communication This informative new book on state-of-the-art visible light communication (VLC) provides, for the first time, a systematical and advanced treatment of modulation and signal processing for VLC. *Visible Light Communications: Modulation and*

Signal Processing offers a practical guide to designing VLC, linking academic research with commercial applications. In recent years, VLC has attracted attention from academia and industry since it has many advantages over the traditional radio frequency, including wide unregulated bandwidth, high security, and low cost. It is a promising complementary technique in 5G and beyond wireless communications, especially in indoor applications. However, lighting constraints have not been fully considered in the open literature when considering VLC system design, and its importance has been underestimated. That's why this book—written by a team of experts with both academic research experience and industrial development experience in the field—is so welcome. To help readers understand the theory and design of VLC systems, the book: Details many modern techniques on both modulation and signal processing aspects Links academic research with commercial applications in visible light communications as well as other wireless communication systems Combines theoretical rigor with practical examples in presenting optical camera communication systems Visible Light Communications: Modulation and Signal Processing serves as a useful tool and reference book for visible light communication professionals, as well as wireless communication system professionals and project managers. It is also an important guide for undergraduates and graduates who want to conduct research in areas of wireless communications.

**Handbook of Laser Technology and Applications** - Chunlei Guo  
2021-06-23

This comprehensive handbook gives a fully updated guide to lasers and laser technologies, including the complete range of their technical applications. This fourth volume covers laser applications in the medical, metrology and communications fields. Key Features: • Offers a complete update of the original, bestselling work, including many brand-new chapters. • Deepens the introduction to fundamentals, from laser design and fabrication to host matrices for solid-state lasers, energy level diagrams, hosting materials, dopant energy levels, and lasers based on nonlinear effects. • Covers new laser types, including quantum cascade lasers, silicon-based lasers, titanium sapphire lasers, terahertz lasers, bismuth-doped fiber lasers, and diode-pumped alkali lasers. • Discusses the latest applications, e.g., lasers in microscopy, high-speed imaging, attosecond metrology, 3D printing, optical atomic clocks, time-resolved spectroscopy, polarization and profile measurements, pulse measurements, and laser-induced fluorescence detection. • Adds new sections on laser materials processing, laser spectroscopy, lasers in imaging, lasers in environmental sciences, and lasers in communications. This handbook is the ideal companion for scientists, engineers, and students working with lasers, including those in optics, electrical engineering, physics, chemistry, biomedicine, and other relevant areas.

**An Introduction to Optical Wireless Mobile Communication** - Harald Haas  
2021-09-30

The use of the optical spectrum for wireless communications has gained significant interest in recent years. Applications range from low-rate simplex transmission links using existing embedded CMOS cameras in smartphones, referred to as optical camera communications (OCC), mobile light fidelity (LiFi) networking in homes, offices, urban and sub-sea environments to free-space gigabit interconnects in data centers and point-to-point long-range wireless backhaul links outdoors and in space. This exciting book focuses on the use of optical wireless communications (OWC) for mobile use cases. The book discusses existing conventional radio frequency (RF)-based wireless access technology and presents the challenges that can impact the requirements of the future wave of new wireless services in the context of artificial intelligence (AI) driven autonomous systems and machine-type communications. The relationship between visible light communications (VLC) and light fidelity (LiFi), is explored, and the major advantages of VLC and LiFi such as security and data density, and discuss existing research challenges are also introduced. Channel modeling techniques are provided for mobile multiuser scenarios, and will introduce key building blocks to achieve LiFi cellular networks achieving orders of magnitude improvements of area spectral efficiency compared to state-of-the-art. Challenges that arise from moving from a static point-to-point visible light link to a LiFi network that is capable of serving hundreds of mobile and fixed nodes are discussed. An overview of recent standardization activities and the commercialization challenges of this disruptive technology is also provided.

**Index Modulation for 5G Wireless Communications** - Miaowen Wen  
2016-12-23

This book presents a thorough examination of index modulation, an

emerging 5G modulation technique. It includes representative transmitter and receiver design, optimization, and performance analysis of index modulation in various domains. First, the basic spatial modulation system for the spatial domain is introduced. Then, the development of a generalized pre-coding aided quadrature spatial modulation system as well as a virtual spatial modulation system are presented. For the space-time domain, a range of differential spatial modulation systems are examined, along with the pre-coding design. Both basic and enhanced index modulated OFDM systems for the frequency domain are discussed, focusing on the verification of their strong capabilities in inter-carrier interference mitigation. Finally, key open problems are highlighted and future research directions are considered. Designed for researchers and professionals, this book is essential for anyone working in communications networking, 5G, and system design. Advanced-level students of engineering and computer science interested in efficiency techniques will also find the content valuable.

**Springer Handbook of Optical Networks** - Biswanath Mukherjee  
2020-10-15

This handbook is an authoritative, comprehensive reference on optical networks, the backbone of today's communication and information society. The book reviews the many underlying technologies that enable the global optical communications infrastructure, but also explains current research trends targeted towards continued capacity scaling and enhanced networking flexibility in support of an unabated traffic growth fueled by ever-emerging new applications. The book is divided into four parts: Optical Subsystems for Transmission and Switching, Core Networks, Datacenter and Super-Computer Networking, and Optical Access and Wireless Networks. Each chapter is written by world-renown experts that represent academia, industry, and international government and regulatory agencies. Every chapter provides a complete picture of its field, from entry-level information to a snapshot of the respective state-of-the-art technologies to emerging research trends, providing something useful for the novice who wants to get familiar with the field to the expert who wants to get a concise view of future trends.

**Visible Light Communication** - Shlomi Arnon 2015-03-05

Visible light communication (VLC) is an evolving communication technology for short-range applications. Exploiting recent advances in the development of high-power visible-light emitting LEDs, VLC offers an energy-efficient, clean alternative to RF technology, enabling the development of optical wireless communication systems that make use of existing lighting infrastructure. Drawing on the expertise of leading researchers from across the world, this concise book sets out the theoretical principles of VLC, and outlines key applications of this cutting-edge technology. Providing insight into modulation techniques, positioning and communication, synchronisation, and industry standards, as well as techniques for improving network performance, this is an invaluable resource for graduate students and researchers in the fields of visible light communication, optical wireless communication, and industrial practitioners in the field of telecommunications.

**Proceedings of International Conference on Recent Trends in Machine Learning, IoT, Smart Cities and Applications** - Vinit Kumar Gunjan 2020-10-17

This book gathers selected research papers presented at the International Conference on Recent Trends in Machine Learning, IOT, Smart Cities & Applications (ICMISC 2020), held on 29–30 March 2020 at CMR Institute of Technology, Hyderabad, Telangana, India. Discussing current trends in machine learning, Internet of things, and smart cities applications, with a focus on multi-disciplinary research in the area of artificial intelligence and cyber-physical systems, this book is a valuable resource for scientists, research scholars and PG students wanting formulate their research ideas and find the future directions in these areas. Further, it serves as a reference work anyone wishing to understand the latest technologies used by practicing engineers around the globe.

**Visible Light Communication** - Suseela Vappangi 2021-08-10

The field of visible light communication (VLC) has diverse applications to the end user including streaming audio, video, high-speed data browsing, voice over internet and online gaming. This comprehensive textbook discusses fundamental aspects, research activities and modulation techniques in the field of VLC. Visible Light Communication: A Comprehensive Theory and Applications with MATLAB® discusses topics including line of sight (LOS) propagation model, non-line of sight (NLOS) propagation model, carrier less amplitude and phase modulation, multiple-input-multiple-output (MIMO), non-linearities of optical sources,

orthogonal frequency-division multiple access, non-orthogonal multiple access and single-carrier frequency-division multiple access in depth. Primarily written for senior undergraduate and graduate students in the field of electronics and communication engineering for courses on optical wireless communication and VLC, this book: Provides up-to-date literature in the field of VLC Presents MATLAB codes and simulations to help readers understand simulations Discusses applications of VLC in enabling vehicle to vehicle (V2V) communication Covers topics including radio frequency (RF) based wireless communications and VLC Presents modulation formats along with the derivations of probability of error expressions pertaining to different variants of optical OFDM

*Wireless Video Communications* - Lajos Hanzo 2001-03-12

Bridging the gap between the video compression and communication communities, this unique volume provides an all-encompassing treatment of wireless video communications, compression, channel coding, and wireless transmission as a joint subject. WIRELESS VIDEO

COMMUNICATIONS begins with relatively simple compression and information theoretical principles, continues through state-of-the-art and future concepts, and concludes with implementation-ready system solutions. This book's deductive presentation and broad scope make it essential for anyone interested in wireless communications. It

systematically converts the lessons of Shannon's information theory into design principles applicable to practical wireless systems. It provides in a comprehensive manner "implementation-ready" overall system design and performance studies, giving cognizance to the contradictory design requirements of video quality, bit rate, delay, complexity error resilience, and other related system design aspects. Topics covered include information theoretical foundations block-based and convolutional channel coding very-low-bit-rate video codecs and multimode videophone transceivers high-resolution video coding using both proprietary and standard schemes CDMA/OFDM systems, third-generation and beyond adaptive video systems. WIRELESS VIDEO COMMUNICATIONS is a valuable reference for postgraduate researchers, system engineers, industrialists, managers and visual communications practitioners.

**Multicarrier Modulation with Low PAR** - Jose Tellado 2006-04-18

Multicarrier Modulation with Low PAR: Applications to DSL and Wireless provides the first comprehensive formulation of the PAR problem for multicarrier modulation and proposes three new methods for PAR reduction. The information in this book will be vital to practicing engineers, industrial researchers, scientists, graduate and postgraduate researchers, and others working in multicarrier transmission and communication theory. Multicarrier Modulation with Low PAR: Applications to DSL and Wireless serves as a valuable reference to both design engineers and communications theorists, and can also be used for advanced courses on the subject.

*OFDM and MC-CDMA* - Lajos Hanzo 2007-01-11

Wireless communications has witnessed a tremendous growth during the past decade and further spectacular enabling technology advances are expected in an effort to render ubiquitous wireless connectivity a reality. Currently, a technical in-depth book on this subject is unavailable, which has a similar detailed exposure of OFDM, MIMO-OFDM and MC-CDMA. A further attraction of the joint treatment of these topics is that it allows the reader to view their design trade-offs in a comparative context.

Divided into three main parts: Part I provides a detailed exposure of OFDM designed for employment in various applications Part II is another design alternative applicable in the context of OFDM systems where the channel quality fluctuations observed are averaged out with the aid of frequency-domain spreading codes, which leads to the concept of MC-CDMA Part III discusses how to employ multiple antennas at the base station for the sake of supporting multiple users in the uplink By providing an all-encompassing self-contained treatment this volume will appeal to a wide readership, as it is both an easy-reading textbook and a high-level research monograph.

**OFDM for Optical Communications** - William Shieh 2009-09-18

The first book on optical OFDM by the leading pioneers in the field The only book to cover error correction codes for optical OFDM Gives applications of OFDM to free-space communications, optical access networks, and metro and log haul transports show optical OFDM can be implemented Contains introductions to signal processing for optical engineers and optical communication fundamentals for wireless engineers This book gives a coherent and comprehensive introduction to the fundamentals of OFDM signal processing, with a distinctive focus on its broad range of applications. It evaluates the architecture, design and performance of a number of OFDM variations, discusses coded OFDM, and gives a detailed study of error correction codes for access networks,

100 Gb/s Ethernet and future optical networks. The emerging applications of optical OFDM, including single-mode fiber transmission, multimode fiber transmission, free space optical systems, and optical access networks are examined, with particular attention paid to passive optical networks, radio-over-fiber, WiMAX and UWB communications.

Written by two of the leading contributors to the field, this book will be a unique reference for optical communications engineers and scientists.

Students, technical managers and telecom executives seeking to understand this new technology for future-generation optical networks will find the book invaluable. William Shieh is an associate professor and reader in the electrical and electronic engineering department, The University of Melbourne, Australia. He received his M.S. degree in electrical engineering and Ph.D. degree in physics both from University of Southern California. Ivan Djordjevic is an Assistant Professor of Electrical and Computer Engineering at the University of Arizona, Tucson, where he directs the Optical Communications Systems Laboratory (OCSL). His current research interests include optical networks, error control coding, constrained coding, coded modulation, turbo equalization, OFDM applications, and quantum error correction.

"This wonderful book is the first one to address the rapidly emerging optical OFDM field. Written by two leading researchers in the field, the book is structured to comprehensively cover any optical OFDM aspect one could possibly think of, from the most fundamental to the most specialized. The book adopts a coherent line of presentation, while striking a thoughtful balance between the various topics, gradually developing the optical-physics and communication-theoretic concepts required for deep comprehension of the topic, eventually treating the multiple optical OFDM methods, variations and applications. In my view this book will remain relevant for many years to come, and will be increasingly accessed by graduate students, accomplished researchers as well as telecommunication engineers and managers keen to attain a perspective on the emerging role of OFDM in the evolution of photonic networks." -- Prof. Moshe Nazarathy, EE Dept., Technion, Israel Institute of Technology \* The first book on optical OFDM by the leading pioneers in the field \* The only book to cover error correction codes for optical OFDM \* Applications of OFDM to free-space communications, optical access networks, and metro and log haul transports show optical OFDM can be implemented \* An introduction to signal processing for optical communications \* An introduction to optical communication fundamentals for the wireless engineer

*Principles of LED Light Communications* - Svilen Dimitrov 2015-03-12

Learn how to build efficient, simple, high performance indoor optical wireless communication systems based on visible and infrared light.

*A Course in Digital Signal Processing* - Boaz Porat 1997

Highly acclaimed teacher and researcher Porat presents a clear, approachable text for senior and first-year graduate level DSP courses. Principles are reinforced through the use of MATLAB programs and application-oriented problems.

**Advances in Communication Systems and Networks** - J. Jayakumari 2020-06-13

This book presents the selected peer-reviewed papers from the International Conference on Communication Systems and Networks (ComNet) 2019. Highlighting the latest findings, ideas, developments and applications in all areas of advanced communication systems and networking, it covers a variety of topics, including next-generation wireless technologies such as 5G, new hardware platforms, antenna design, applications of artificial intelligence (AI), signal processing and optimization techniques. Given its scope, this book can be useful for beginners, researchers and professionals working in wireless communication and networks, and other allied fields.

*Optical Fiber and Wireless Communications* - Rastislav Róka 2017-06-21

The book *Optical Fiber and Wireless Communications* provides a platform for practicing researchers, academics, PhD students, and other scientists to review, plan, design, analyze, evaluate, intend, process, and implement diversiform issues of optical fiber and wireless systems and networks, optical technology components, optical signal processing, and security. The 17 chapters of the book demonstrate capabilities and potentialities of optical communication to solve scientific and engineering problems with varied degrees of complexity.

**Next Generation Wireless Terahertz Communication Networks** - Saim Ghafoor 2021-08-10

The rapid growth of the data traffic demands new ways to achieve high-speed wireless links. The backbone networks, data centers, mission-critical applications, as well as end-users sitting in office or home, all require ultra-high throughput and ultra-low latency wireless links.

Sophisticated technological advancement and huge bandwidth are required to reduce the latency. Terahertz band, in this regard, has a huge potential to provide these high-capacity links where a user can download the file in a few seconds. To realize the high-capacity wireless links for future applications, in this book, different aspects of the Terahertz band wireless communication network are presented. This book highlights the Terahertz channel characteristics and modeling, antenna design and beamforming, device characterization, applications, and protocols. It also provides state-of-the-art knowledge on different communication aspects of Terahertz communication and techniques to realize the true potential of the Terahertz band for wireless communication.

**Optical Communications and Networking** - Zhongqi Pan 2020-03-10

In the past few decades, the optical communication industry has explored multiple degrees of freedom of the photon, such as time, wavelength, amplitude, phase, polarization, and space, to significantly reduce the cost/bit of data transmission by increasing the capacity per fiber through multiplexing technology and by reducing the size and power through electronic and photonic integration. This book aims to explore the latest advancements in this industry, including the technologies in devices, systems, and network levels with applications from short-reach chip-to-chip interconnections to long-haul backbone communications at the trans-oceanic distance.

*Visible Light Communications* - Zhaocheng Wang 2017-11-29

A complete and comprehensive reference on modulation and signal processing for visible light communication This informative new book on state-of-the-art visible light communication (VLC) provides, for the first time, a systematical and advanced treatment of modulation and signal processing for VLC. *Visible Light Communications: Modulation and Signal Processing* offers a practical guide to designing VLC, linking academic research with commercial applications. In recent years, VLC has attracted attention from academia and industry since it has many advantages over the traditional radio frequency, including wide unregulated bandwidth, high security, and low cost. It is a promising complementary technique in 5G and beyond wireless communications, especially in indoor applications. However, lighting constraints have not been fully considered in the open literature when considering VLC system design, and its importance has been underestimated. That's why this book—written by a team of experts with both academic research experience and industrial development experience in the field—is so welcome. To help readers understand the theory and design of VLC systems, the book: Details many modern techniques on both modulation and signal processing aspects Links academic research with commercial applications in visible light communications as well as other wireless communication systems Combines theoretical rigor with practical examples in presenting optical camera communication systems *Visible Light Communications: Modulation and Signal Processing* serves as a useful tool and reference book for visible light communication professionals, as well as wireless communication system professionals and project managers. It is also an important guide for undergraduates and graduates who want to conduct research in areas of wireless communications.

**Fundamentals of Wireless Communication** - David Tse 2005-05-26

This textbook takes a unified view of the fundamentals of wireless communication and explains cutting-edge concepts in a simple and intuitive way. An abundant supply of exercises make it ideal for graduate courses in electrical and computer engineering and it will also be of great interest to practising engineers.

*Visible Light Communications* - Peter Adam Hoeher 2019-07-08

Visible Light Communication (VLC) is an emerging wireless data transmission technology. Light is used simultaneously for illumination as well as for communication and/or positioning purposes. If fully networked, dubbed Li-Fi, VLC systems complement Wi-Fi access points. VLC is an incident of optical wireless communications (OWC). OWC systems provide high data security, are license-free, and may substitute radio systems when these either fail or are not permitted. VLC technology enhances smart lighting infrastructure and Internet-of-Things (IoT) use cases. LED-based Car-to-X communication is an enabling platform towards autonomous driving. The textbook covers OWC applications, fundamentals of illumination engineering, channel modeling, optical intensity modulation schemes, VLC standardization efforts, the software-defined radio concept, selection criteria of photonic devices, fundamental circuit designs, and visible light positioning. The book is written for students in electrical and information engineering or adjacent areas, as well as for engineers, information scientists, and

physicists in research and development.

*Analogue Optical Fibre Communications* - Brett Wilson 1995

This book covers issues involved in improving the present range of systems and technology of optical fibre based telecommunications services operating with analogue-sourced signals.

*Advances in Signal Processing and Communication* - Banmali S. Rawat 2018-11-19

This book is a collection of selected peer-reviewed papers presented at the International Conference on Signal Processing and Communication (ICSC 2018). It covers current research and developments in the fields of communications, signal processing, VLSI circuits and systems, and embedded systems. The book offers in-depth discussions and analyses of latest problems across different sub-fields of signal processing and communications. The contents of this book will prove to be useful for students, researchers, and professionals working in electronics and electrical engineering, as well as other allied fields.

*New Knowledge in Information Systems and Technologies* - Álvaro Rocha 2019-03-29

This book includes a selection of articles from The 2019 World Conference on Information Systems and Technologies (WorldCIST'19), held from April 16 to 19, at La Toja, Spain. WorldCIST is a global forum for researchers and practitioners to present and discuss recent results and innovations, current trends, professional experiences and challenges in modern information systems and technologies research, together with their technological development and applications. The book covers a number of topics, including A) Information and Knowledge Management; B) Organizational Models and Information Systems; C) Software and Systems Modeling; D) Software Systems, Architectures, Applications and Tools; E) Multimedia Systems and Applications; F) Computer Networks, Mobility and Pervasive Systems; G) Intelligent and Decision Support Systems; H) Big Data Analytics and Applications; I) Human-Computer Interaction; J) Ethics, Computers & Security; K) Health Informatics; L) Information Technologies in Education; M) Information Technologies in Radiocommunications; and N) Technologies for Biomedical Applications.

**Ad Hoc and Sensor Networks** - Carlos de Moraes Cordeiro 2011

This book provides a comprehensive yet easy coverage of ad hoc and sensor networks and fills the gap of existing literature in this growing field. It emphasizes that there is a major interdependence among various layers of the network protocol stack. Contrary to wired or even one-hop cellular networks, the lack of a fixed infrastructure, the inherent mobility, the wireless channel, and the underlying routing mechanism by ad hoc and sensor networks introduce a number of technological challenges that are difficult to address within the boundaries of a single protocol layer. All existing textbooks on the subject often focus on a specific aspect of the technology, and fail to provide critical insights on cross-layer interdependencies. To fully understand these intriguing networks, one need to grasp specific solutions individually, and also the many interdependencies and cross-layer interactions.

*Multiple Access Techniques for 5G Wireless Networks and Beyond* - Mojtaba Vaezi 2018-08-23

This book presents comprehensive coverage of current and emerging multiple access, random access, and waveform design techniques for 5G wireless networks and beyond. A definitive reference for researchers in these fields, the book describes recent research from academia, industry, and standardization bodies. The book is an all-encompassing treatment of these areas addressing orthogonal multiple access and waveform design, non-orthogonal multiple access (NOMA) via power, code, and other domains, and orthogonal, non-orthogonal, and grant-free random access. The book builds its foundations on state of the art research papers, measurements, and experimental results from a variety of sources.

**Guide to Bluetooth Security** - Karen Scarfone 2009-05-01

This document provides info. to organizations on the security capabilities of Bluetooth and provide recommendations to organizations employing Bluetooth technologies on securing them effectively. It discusses Bluetooth technologies and security capabilities in technical detail. This document assumes that the readers have at least some operating system, wireless networking, and security knowledge. Because of the constantly changing nature of the wireless security industry and the threats and vulnerabilities to the technologies, readers are strongly encouraged to take advantage of other resources (including those listed in this document) for more current and detailed information. Illustrations.

*MIMO Radar Signal Processing* - Jian Li 2008-10-10

The first book to present a systematic and coherent picture of MIMO radars Due to its potential to improve target detection and discrimination

capability, Multiple-Input and Multiple-Output (MIMO) radar has generated significant attention and widespread interest in academia, industry, government labs, and funding agencies. This important new work fills the need for a comprehensive treatment of this emerging field. Edited and authored by leading researchers in the field of MIMO radar research, this book introduces recent developments in the area of MIMO radar to stimulate new concepts, theories, and applications of the topic, and to foster further cross-fertilization of ideas with MIMO communications. Topical coverage includes: Adaptive MIMO radar Beampattern analysis and optimization for MIMO radar MIMO radar for target detection, parameter estimation, tracking, association, and recognition MIMO radar prototypes and measurements Space-time codes for MIMO radar Statistical MIMO radar Waveform design for MIMO radar Written in an easy-to-follow tutorial style, MIMO Radar Signal Processing serves as an excellent course book for graduate students and a valuable reference for researchers in academia and industry.

**Optical Wireless Communications** - Z. Ghassemlooy 2017-07-12

Detailing a systems approach, *Optical Wireless Communications: System and Channel Modelling with MATLAB®*, is a self-contained volume that concisely and comprehensively covers the theory and technology of optical wireless communications systems (OWC) in a way that is suitable for undergraduate and graduate-level students, as well as researchers and professional engineers. Incorporating MATLAB® throughout, the authors highlight past and current research activities to illustrate optical sources, transmitters, detectors, receivers, and other devices used in optical wireless communications. They also discuss both indoor and outdoor environments, discussing how different factors—including various channel models—affect system performance and mitigation techniques. In addition, this book broadly covers crucial aspects of OWC systems: Fundamental principles of OWC Devices and systems Modulation techniques and schemes (including polarization shift keying) Channel models and system performance analysis Emerging visible light communications Terrestrial free space optics communication Use of infrared in indoor OWC One entire chapter explores the emerging field of visible light communications, and others describe techniques for using theoretical analysis and simulation to mitigate channel impact on system performance. Additional topics include wavelet denoising, artificial neural networks, and spatial diversity. Content also covers different challenges encountered in OWC, as well as outlining possible solutions and current research trends. A major attraction of the book is the presentation of MATLAB simulations and codes, which enable readers to execute extensive simulations and better understand OWC in general.

**Wireless Communications, Networking and Applications** - Qing-An Zeng 2015-10-28

This book is based on a series of conferences on Wireless Communications, Networking and Applications that have been held on December 27-28, 2014 in Shenzhen, China. The meetings themselves were a response to technological developments in the areas of wireless communications, networking and applications and facilitate researchers, engineers and students to share the latest research results and the advanced research methods of the field. The broad variety of disciplines involved in this research and the differences in approaching the basic problems are probably typical of a developing field of interdisciplinary research. However, some main areas of research and development in the emerging areas of wireless communication technology can now be identified. The contributions to this book are mainly selected from the papers of the conference on wireless communications, networking and applications and reflect the main areas of interest: Section 1 - Emerging Topics in Wireless and Mobile Computing and Communications; Section

2 - Internet of Things and Long Term Evolution Engineering; Section 3 - Resource Allocation and Interference Management; Section 4 - Communication Architecture, Algorithms, Modeling and Evaluation; Section 5 - Security, Privacy, and Trust; and Section 6 - Routing, Position Management and Network Topologies.

**Next-Generation Networks** - Daya K. Lobiyal 2017-11-18

This book comprises select proceedings of the 2015 annual conference of the Computer Society of India. The book focuses on next generation networks (NGN). An NGN is a packet-based network which can provide services including telecommunication services. NGNs make use of multiple broadband, quality-of-service-enabled transport technologies in which service-related functions are independent from underlying transport-related technologies. This volume includes contributions from experts on various aspects of NGNs. The papers included cover theory, methodology and applications of ad-hoc networks, sensor networks, and the internet. The contents also delve into how the new enterprise IT landscape of cloud services, mobility, social media usage and big data analytics creates different types of network traffic to the traditional mix of in-house client-server enterprise workloads. The contents of this book will be useful to researchers and professionals alike.

**Millimeter Wave Communication Systems** - Kao-Cheng Huang 2011-04-20

The aim of this book is to present the modern design and analysis principles of millimeter-wave communication system for wireless devices and to give postgraduates and system professionals the design insights and challenges when integrating millimeter wave personal communication system. Millimeter wave communication system are going to play key roles in modern gigabit wireless communication area as millimeter-wave industrial standards from IEEE, European Computer Manufacturing Association (ECMA) and Wireless High Definition (Wireless HD) Group, are on their way to the market. The book will review up-to-date research results and utilize numerous design and analysis for the whole system covering from Millimeter wave frontend to digital signal processing in order to address major topics in a high speed wireless system. This book emphasizes the importance and the requirements of high-gain antennas, low power transceiver, adaptive equalizer/modulation, channel coding and adaptive multi-user detection for gigabit wireless communications. In addition, the book will include the updated research literature and patents in the topics of transceivers, antennas, MIMO, channel capacity, coding, equalizer, Modem and multi-user detection. Finally the application of these antennas will be discussed in light of different forthcoming wireless standards at V-band and E-band.

**Big Data and Smart Digital Environment** - Yousef Farhaoui 2019-02-21

This book reviews the state of the art of big data analysis and smart city. It includes issues which pertain to signal processing, probability models, machine learning, data mining, database, data engineering, pattern recognition, visualisation, predictive analytics, data warehousing, data compression, computer programming, smart city, etc. Data is becoming an increasingly decisive resource in modern societies, economies, and governmental organizations. Data science inspires novel techniques and theories drawn from mathematics, statistics, information theory, computer science, and social science. Papers in this book were the outcome of research conducted in this field of study. The latter makes use of applications and techniques related to data analysis in general and big data and smart city in particular. The book appeals to advanced undergraduate and graduate students, postdoctoral researchers, lecturers and industrial researchers, as well as anyone interested in big data analysis and smart city.