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Applications of Digital Signal Processing through Practical Approach - Sudhakar Radhakrishnan 2015-10-28
This book is recommended to readers who can ponder on the collection of chapters authored/co-authored by various researchers as well as to researchers around the world covering the field of digital signal processing. This book highlights current research in the digital signal processing area such as communication engineering, image processing and power conversion system. The entire work available in the book mainly focusses on researchers who can do quality research in the area of digital signal processing and related fields. Each chapter is an independent research, which will definitely motivate young researchers to further study the subject. These six chapters divided into three sections will be an eye-opener for all those engaged in systematic research in these fields.
MIMO-OFDM Wireless Communications with MATLAB - Yong Soo Cho 2010-08-20
MIMO-OFDM is a key technology for next-generation cellular communications (3GPP-LTE, Mobile WiMAX, IMT-Advanced) as well as wireless LAN (IEEE 802.11a, IEEE 802.11n), wireless PAN (MB-OFDM), and broadcasting (DAB, DVB, DMB). In MIMO-OFDM Wireless Communications with MATLAB®, the authors provide a comprehensive introduction to the theory and practice of wireless channel modeling, OFDM, and MIMO, using MATLAB® programs to simulate the various techniques on MIMO-OFDM systems. One of the only books in the area dedicated to explaining simulation aspects Covers implementation to help cement the key concepts Uses materials that have been classroom-tested in numerous universities Provides the analytic solutions and practical examples with downloadable MATLAB® codes Simulation examples based on actual industry and research projects Presentation slides with key equations and figures for instructor use MIMO-OFDM Wireless Communications with MATLAB® is a key text for graduate students in wireless communications. Professionals and technicians in wireless communication fields, graduate students in signal processing, as well as senior undergraduates majoring in wireless communications will find this book a practical introduction to the MIMO-OFDM techniques. Instructor materials and MATLAB® code examples available for download at www.wiley.com/go/chomimo
Advanced Optical and Wireless Communications Systems - Ivan B. Djordjevic 2022-07-23
The new edition of this popular textbook keeps its structure, introducing the advanced topics of: (i) wireless communications, (ii) free-space optical (FSO) communications, (iii) indoor optical wireless (IR) communications, and (iv) fiber-optics communications, but thoroughly updates the content for new technologies and practical applications. The author presents fundamental concepts, such as propagation principles, modulation formats, channel coding, diversity principles, MIMO signal processing, multicarrier modulation, equalization, adaptive modulation and coding, detection principles, and software defined transmission, first describing them and then following up with a detailed look at each particular system. The book is self-contained and structured to provide straightforward guidance to readers looking to capture fundamentals and gain theoretical and practical knowledge about wireless communications, free-space optical communications, and fiber-optics communications, all which can be readily applied in studies, research, and practical applications. The textbook is intended for an upper undergraduate or graduate level courses in fiber-optics communication, wireless communication, and free-space optical communication problems, an appendix with all background material needed, and homework problems. In the second edition, in addition to the existing chapters being updated and problems being inserted, one new chapter has been added, related to the physical-layer security thus covering both security and reliability issues. New material on 5G and 6G technologies has been added in corresponding chapters.
Single- And Multi-Carrier Mimo Transmission for Broadband Wireless Systems - Ramjee Prasad 2022-09-01
The main focus of Single- and Multi-Carrier MIMO Transmission for Broadband Wireless Systems is to provide the basic understanding of the underlying techniques related to PHY-MAC design of future wireless systems. It includes basic concepts related to single- and multi-carrier transmissions together with MIMO techniques. Discussions related to different recent standards that use single- and multi-carrier transmissions are also explained.Single- and Multi-Carrier MIMO Transmission for Broadband Wireless Systems provides a comprehensive and holistic approach to the variety of technical solutions. Future system design would require these different technologies to work together, and not independently. Therefore, it is very important to analyze the effects and gains when they are put together in a unified platform. This is the prime focus of this book. Moreover, the authors include recent research results which are not yet published in another form. The book is intended to be used for lectures in graduate level courses at universities. PhD level students should also find it useful as this book will outline the fundamental concepts and design methods for PHY and MAC layers of future wireless systems. This book can also be used as a reference by engineers and developers in the industry as well as by researchers in academia. For professionals, system architects and managers who play a key role in the selection of a baseline system concept for future wireless standards, such as IMT-Advanced type architecture, the authors will include discussions, analysis and guidelines to highlight overall system level perspective.
Advanced Mimo Systems - Kosai Raoof 2009

IMPROVISING SER BY EMPLOYING PAPR IN OFDM USING ARMA COMPANDING - Dr. Kailas S Patil

Multi-Carrier Digital Communications - Ahmad R.S. Bahai 2006-04-11
ulti-carrier modulation, Orthogonal Frequency Division Multi- Mplexing (OFDM) particularly, has been successfully applied to a wide variety of digital communications applications over the past several years. Although OFDM has been chosen as the physical layer standard for a diversity of important systems, the theory, algorithms, and implementation techniques remain subjects of current interest. This is clear from the high volume of papers appearing in technical journals and conferences. Multi-carrier modulation continues to evolve rapidly. It is hoped that this book will remain a valuable summary of the technology, p- viding an understanding of new advances as well as the present core technology. The Intended Audience This book is intended to be a concise summary of the present state of the art of the theory and practice of OFDM technology. The authors believe that the time is ripe for such a treatment. Particularly based on one of the author’s long experience in development of wireless systems (AB), and the other’s in wireline systems (BS), we have - tempted to present a unified presentation of OFDM performance and xviii implementation over a wide variety of channels. It is hoped that this will prove valuable both to developers of such systems and to researchers and graduate students involved in analysis of digital communications.
Multi-Carrier and Spread Spectrum Systems - Khaled Fazel 2008-09-15
The technological progress in multi-carrier (MC) modulation led orthogonal frequency division multiplexing (OFDM) to become an important part of beyond 3G cellular mobile communication standards, including LTE and WiMAX. In addition, the flexibility offered by the

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

Energy and Bandwidth-Efficient Wireless Transmission - Wei Gao 2017-02-10

This book introduces key modulation and predistortion techniques for approaching power and spectrum-efficient transmission for wireless communication systems. The book presents a combination of theoretical principles, practical implementations, and actual tests. It focuses on power and spectrally efficient modulation and transmission techniques in the portable wireless communication systems, and introduces currently developed and designed RF transceivers in the latest wireless markets. Most materials, design examples, and design strategies used are based on the author’s two decades of work in the digital communication fields, especially in the areas of the digital modulations, demodulations, digital signal processing, and linearization of power amplifiers. The applications of these practical products and equipment cover the satellite communications on earth station systems, microwave communication systems, 2G GSM and 3G WCDMA mobile communication systems, and 802.11 WLAN systems.>

Ultra Wideband Demystified Technologies, Applications, and System Design Considerations - Sunil Jogi 2022-09-01

Ultra Wideband Demystified: Technologies, Applications, and System Design Considerations is a comprehensive text for emerging high speed short range wireless technology of Ultra Wideband. It provides background concepts and information on evolving standards and their development efforts, radio technology, practical system design/implementation and real life applications. The book also deliberates on the regulatory frameworks, security aspects and power management techniques essential to Ultra Wideband usage in consumer devices like portable handheld mobile devices. Important topics as UWB common radio usage for adapting to different existing/new applications and upper layer protocols like Wireless USB are also discussed.ContentsAbstract :• Introduction to Short Range Wireless;• Introduction to Ultra Wideband;• Evolution of UWB Standards;• Physical Layer;• Medium Access Layer;• Advanced MAC Features;• UWB System Design;• Adaptation to Multiple Applications;• Wireless USB;• Converging Marketplace; ReferencesForeword"This book is very timely, unique and fresh in its approach, coming from engineers who have been involved in system design and standard development stages. In particular, the book stands out amongst other literature available because it highlights system designer's viewpoints and because of it covering the whole gamut of technology from practitioner's viewpoints ... I would strongly recommend this book to System Designers, Practicing Engineers, Researchers in Academia and Industry, Product Marketing and Technical strategists for a comprehensive reading on the emerging UWB technologies. I commend Sunil Jogi and Manoj Choudhary for a very timely contribution."Bart Vertenten Chief Architect Connectivity, NXP Semiconductors

Adaptive PHY-MAC Design for Broadband Wireless Systems - Ramjee Prasad 2022-09-01

The next generation mobile communication networks (4G) have the challenging target of The next generation mobile communication networks (4G) have the challenging target of providing a peak data rate of 1 Gigabit per second local area and 100 Megabit per second wide area. The ability to offer such high data rates in 100MHz bandwidth requires overall a very high spectral efficiency, and hence the need for multi-antenna techniques (MIMO) with spatial multiplexing, fast dynamic link adaptation and packet scheduling, wideband access techniques, and most likely non-contention based spectrum sharing among multiple operators. Many of these required technology components and techniques are well researched and established. Adaptive PHY-MAC Design for Broadband Wireless Systems explains how one can integrate and optimise their use in providing the target cell data rates with high availability. The authors address the ability to cope with interference and enhanced physical layer processing, and simultaneously, the multifaceted system level design. Focus is also on the selection of technology components and techniques, which leads to the highest spectral efficiency and peak data rate availability with reasonable Quality of Service (QoS) support, such as improved outage scenario, reduced delay, guaranteed bit rate, etc.In short, this book will answer questions such as, how individual techniques relate to each other, how can we benefit the gains by suitable combinations of different technologies and how to choose different technological solutions in different scenarios, etc.The next generation mobile communication networks (4G) have the challenging target of The next generation mobile communication networks (4G) have the challenging target of providing a peak data rate of 1 Gigabit per second local area and 100 Megabit per second wide area.

Adaptive and Iterative Signal Processing in Communications - Jinho Choi 2006-11-16

This 2006 book describes the fundamental theory and practical aspects of using ASP, and ISP, to improve receiver performance.

RF and Wireless Technologies: Know It All - Bruce A. Fette 2007-09-26

The Newnes Know It All Series takes the best of what our authors have written to create hard-working desk references that will be an engineer's first port of call for key information, design techniques and rules of thumb. Guaranteed not to gather dust on a shelf! RF (radio frequency) and wireless technologies drive communication today. This technology and its applications enable wireless phones, portable device roaming, and short-range industrial and commercial application communication such as the supply chain management wonder, RFID. Up-to-date information regarding software defined RF, using frequencies smarter, and using more of the spectrum, with ultrawideband technology is detailed. A 360-degree view from best-selling authors including Roberto Aiello, Bruce Fette, and Praphul Chandra Hot topics covered including ultrawideband and cognitive radio technologies The ultimate hard-working desk reference: all the essential information, techniques, and tricks of the trade in one volume

Wireless Networks - Giorgio Franceschetti 2006-06-12

Awarded by the International Calabria's Prize! This multidisciplinary volume originates from lectures presented at a short course on wireless communications in Capri, Italy. This globally attended conference has produced an exceptional book written by pioneers in the field. Lecturers at Capri included pillars in the fields of electromagnetics, communications, information technology and mathematics. As communications technology becomes increasingly wireless, an interdisciplinary viewpoint is necessary for professionals to correct problems and avoid others before they occur. Wireless Networks covers critical technology within WLAN, ad hoc networks, data distribution, TV, radio, and personal mobile devices. As networks become wireless, engineers face increased difficulty securing its malleable boundaries. This book discusses security solutions such as sensor technology that prevent unwanted intrusion. Connectivity is also addressed, featuring chapters on antennas, bandwidth and frequencies. Editors Franceschetti and Stornelli have done a great service to the wireless communications community in creating a compendium that delivers this spectrum of essential information in one reference. *Presents a uniquely panoramic view of wireless networks with viewpoints from engineering, computing, and mathematics *The technology is discussed in theory as well as in practice to help engineers design and modify networks *Globally recognized experts share their critical insight on sensor technology, transfering protocol, ad-hoc networks, and more

Handbook of Communications Security - F. Garzia 2013
Communications represent a strategic sector for privacy protection and for personal, company, national and international security. The interception, damage or lost of information during communication can generate material and non material economic damages from both a personal and collective point of view. The purpose of this book is to give the reader information relating to all aspects of communications security, beginning at the base ideas and building to reach the most advanced and updated concepts. The book will be of interest to integrated system designers, telecommunication designers, system engineers, system analysts, security managers, technicians, intelligence personnel, security personnel, police, army, private investigators, scientists, graduate and postgraduate students and anyone that needs to communicate in a secure way.

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.

Synchronization in Digital Communication Systems - Fuyun Ling 2017-06-22
This practical guide helps readers to learn how to develop and implement synchronization functions in digital communication systems.

LTE, WiMAX and WLAN Network Design, Optimization and Performance Analysis - Leonhard Korowajczuk 2011-11-22
A technological overview of LTE and WiMAX LTE, WiMAX and WLAN Network Design, Optimization and Performance Analysis provides a practical guide to LTE and WiMAX technologies introducing various tools and concepts used within. In addition, topics such as traffic modelling of IP-centric networks, RF propagation, fading, mobility, and indoor coverage are explored; new techniques which increase throughput such as MIMO and AAS technology are highlighted; and simulation, network design and performance analysis are also examined. Finally, in the latter part of the book Korowajczuk gives a step-by-step guide to network design, providing readers with the capability to build reliable and robust data networks. By focusing on LTE and WiMAX this book extends current network planning approaches to next generation wireless systems based on OFDMA, providing an essential resource for engineers and operators of fixed and wireless broadband data access networks. With information presented in a sequential format, LTE, WiMAX and WLAN Network Design, Optimization and Performance Analysis aids a progressive development of knowledge, complementing latter graduate and postgraduate courses while also providing a valuable resource to network designers, equipment vendors, reference material, operators, consultants, and regulators. Key Features: One of the first books to comprehensively explain and evaluate LTE Provides an unique explanation of the basic concepts involved in wireless broadband technologies and their applications in LTE, WiMAX, and WLAN before progressing to the network design Demonstrates the application of network planning for LTE and WiMAX with theoretical and practical approaches Includes all aspects of system design and optimization, such as dynamic traffic simulations, multi-layered traffic analysis, statistical interference analysis, and performance estimations

Key 5G Physical Layer Technologies - Douglas H. Morais 2020-08-21
This book covers the key technologies associated with the physical transmission of data on fifth generation (5G) mobile systems. Following an overview of these technologies, a high-level description of 3GPP's mobile communications standard (5G NR) is given and it is shown how the key technologies presented earlier facilitate the transmission of control data and very high-speed user data. In the final chapter, an overview and the physical layer aspects of 5G NR enabled Fixed Wireless Access (FWA) networks is presented. This book is intended for those practicing engineers and graduate and upper undergraduate engineering students who have an interest in 3GPP's 5G enabled mobile and or FWA networks and want to acquire, where missing, the necessary technology background in order to understand 3GPP's physical layer specifications and operation. Provides a comprehensive covering of key 3GPP 5G NR physical layer technologies, presented in a clear, tractable fashion, with sufficient mathematics to make it technically coherent; Addresses all key 5G NR technologies, including digital modulation, LDPC and Polar coding, multicarrier based multiple access techniques, and multiple antenna techniques including MIMO and beamforming; Presents an overview of 5G NR Radio Access Network (RAN) architecture and a detailed understanding of how user and control data is transported in the physical layer by the application of the technologies presented; Provides an overview and addresses physical layer aspects of 5G NR enabled Fixed Wireless Access networks.

OFDM Wireless LANs - John Terry 2002
Annotation Deploy and optimize your wireless LAN using the new standard for broadband wireless communication, OFDM. A comprehensive reference written by two experts who helped create the OFDM specifications. A detailed, practical guide to OFDM WLANs does not exist, requiring readers to seek out multiple sources of information, such as white papers and research notes. Detailed explanations of the concepts and algorithms behind OFDM-context that is missing from the two OFDM books currently available. This book explains OFDM WLAN basics, including components of OFDM and multicarrier WLAN standards. It provides a practical approach to OFDM by including software and hardware examples and detailed implementation explanations. OFDM Multicarrier Wireless Networks: A Practical Approach defines and explains the mathematical concepts behind OFDM necessary for successful OFDM WLAN implementations. Juha Heiskala is a research engineer at Nokia Research Center in Irving, TX. Heiskala is active in the IEEE 802.11 standards bodies and has been tasked with developing the 802.11a system simulation on several software platforms. He is the inventor/co-inventor of three pending patents in the area of OFDM LANs and co-designed with Dr. John Terry the modulation and coding scheme for achieving 100 Mbps speeds within currently allocated band specifications for OFDM WLANs. John Terry, Ph.D. is a senior research engineer at Nokia Research Center. He is currently managing the OFDM modulation and coding project in the HSA group. Dr. Terry has published several white papers, given numerous presentations on wireless communications, and generated four patents related to OFDM WLANs. He has 10 years of experience working in wireless communications, including tenures at NASA Glen Research Center and Texas Instruments.

Personal Wireless Communications - Marco Conti 2003-10-02
This book constitutes the refereed proceedings of the IFIP-TC6 Eighth - ternational Conference on Personal Wireless Communications, PWC 2003. PWC 2003 is the ?agship conference of the IFIP Working Group 6.8, Mobile and Wireless Communications, and is the premier international forum for discussions between researchers, practitioners, and students interested in the symbiosis of mobile computing and wireless networks. It is a great pleasure to present the PWC 2003 technical program. This year the conference received 115 submissions from 27 countries indicating that PWC is a reference conference for worldwide researchers from the wireless and mobile community. With so many papers to choose from, the Technical Program Committee's job, to provide a conference program of the highest technical quality, was challenging and time consuming. From the 115 submissions, we ?nally selected 34 full papers and 15 short papers for presentation in the conference technical sessions. The conference technical program was split into three days, and included, in addition to the 49 refereed contributions, 4 invited papers from top-level researchers from the mobile and wireless community. To give researchers the opportunity to present ongoing work, and the novel ideas they are starting to explore, we included in the technical program two work-in-progress sessions and two novel-ideas sessions. The technical program also included a poster session devoted to presenting ongoing research projects on wireless and mobile communications.

Embracing Interference in Wireless Systems - Shyamnath Gollakota 2014-06-01
The wireless medium is a shared resource. If nearby devices transmit at the same time, their signals interfere, resulting in a collision. In traditional networks, collisions cause the loss of the transmitted information. For this reason, wireless networks have been designed with the assumption that interference is intrinsically harmful and must be avoided. This book, a revised version of the author's award-winning Ph.D. dissertation, takes an alternate approach: Instead of viewing interference as an inherently counterproductive phenomenon that should to be

avoided, we design practical systems that transform interference into a harmless, and even a beneficial phenomenon. To achieve this goal, we consider how wireless signals interact when they interfere, and use this understanding in our system designs. Specifically, when interference occurs, the signals get mixed on the wireless medium. By understanding the parameters of this mixing, we can invert the mixing and decode the interfered packets; thus, making interference harmless. Furthermore, we can control this mixing process to create strategic interference that allow decodability at a particular receiver of interest, but prevent decodability at unintended receivers and adversaries. Hence, we can transform interference into a beneficial phenomenon that provides security. Building on this approach, we make four main contributions: We present the first WiFi receiver that can successfully reconstruct the transmitted information in the presence of packet collisions. Next, we introduce a WiFi receiver design that can decode in the presence of high-power cross-technology interference from devices like baby monitors, cordless phones, microwave ovens, or even unknown technologies. We then show how we can harness interference to improve security. In particular, we develop the first system that secures an insecure medical implant without any modification to the implant itself. Finally, we present a solution that establishes secure connections between any two WiFi devices, without having users enter passwords or use pre-shared secret keys.

Wireless AI - K. J. Ray Liu 2019-09-30

With this groundbreaking text, discover how wireless artificial intelligence (AI) can be used to determine position at centimeter level, sense motion and vital signs, and identify events and people. Using a highly innovative approach that employs existing wireless equipment and signal processing techniques to turn multipaths into virtual antennas, combined with the physical principle of time reversal and machine learning, it covers fundamental theory, extensive experimental results, and real practical use cases developed for products and applications. Topics explored include indoor positioning and tracking, wireless sensing and analytics, wireless power transfer and energy efficiency, 5G and next-generation communications, and the connection of large numbers of heterogeneous IoT devices of various bandwidths and capabilities. Demo videos accompanying the book online enhance understanding of these topics. Providing a unified framework for wireless AI, this is an excellent text for graduate students, researchers, and professionals working in wireless sensing, positioning, IoT, machine learning, signal processing and wireless communications.

Annual Review of Wireless Communications - International Engineering Consortium 2006

Containing essays from leading experts in the industry that discuss academic theories and practical applications of wireless communications, this book focuses on the latest wireless technologies and advancements. A diverse volume, it seeks to shed light on such topics as business strategies and current trends while combining the perspectives of many specialists across the nation.

Multi-Carrier and Spread Spectrum Systems - K. Fazel 2004-02-06

Frequency spectrum is a limited and valuable resource for wireless communications. A good example can be observed among network operators in Europe for the prices to pay for UMTS-frequency bands. Therefore, the first goal when designing future wireless communication systems (e.g. 4G - fourth generation) has to be the increase in spectral efficiency. The development in digital communications in the past years has enabled efficient modulation and coding techniques for robust and spectral efficient data, speech, audio and video transmission. These are the multi-carrier modulation (e.g. OFDM) and the spread spectrum technique (e.g. DS-CDMA), where OFDM was chosen for broadcast applications (DVB, DAB) as well as for broadband wireless indoor standards (ETSI HIPERLAN-II, IEEE-802.11) and the DS-CDMA was selected in mobile communications (IS-95, third generation mobile radio systems world wide, UMTS/IMT 2000). Since 1993 various combinations of multi-carrier (MC) modulation and the spread spectrum (SS) technique have been introduced and the field of MC-SS communications has become an independent and important research topic with increasing activities. New application fields have been proposed such as high rate cellular mobile, high rate wireless indoor and LMDS. It has been shown that MC-SS offers the high spectral efficiency, robustness and flexibility that is required for the next generation systems. Meanwhile, different alternative hybrid schemes such as OFDM/OFDMA, MC-TDMA, etc. have been deeply analysed and adopted in different international standards (ETSI-BRAN, IEEE-802 & MMAC). Multi-Carrier & Spread-Spectrum: Analysis of Hybrid Air Interfaces draws together all of the above mentioned hybrid schemes therefore providing a greatly needed resource for system engineers, telecommunication designers and researchers in order to enable them to develop, build and deploy several schemes based on MC-transmission for the next generation systems (which will be an integration of broadband multimedia services covering both 4G mobile and fixed wireless systems). * Offers a complete treatment of multi-carrier, spread-spectrum (SS) and time division multiplexing (TDM) techniques * Provides an in-depth insight into hybrid multiple access techniques based on multi-carrier (MC) transmission * Presents numerous hybrid multiple access and air interface architectures including OFDM/CDMA, MC-CDMA, MC-DS-CDMA and MT-CDMA * Covers new techniques such as space-time coding and software radio Telecommunications engineers, hardware & software system designers and researchers as well as students, lecturers and technicians will all find this an invaluable addition to their bookshelf.

MIMO System Technology for Wireless Communications - George Tsoulos 2018-10-03

For broadband communications, it was frequency division multiplexing. For optical communications, it was wavelength division multiplexing. Then, for all types of networks it was code division. Breakthroughs in transmission speed were made possible by these developments, heralding next-generation networks of increasing capability in each case. The basic idea is the same: more channels equals higher throughput. For wireless communications, it is space-time coding using multiple-input-multiple-output (MIMO) technology. Providing a complete treatment of MIMO under a single cover, MIMO System Technology for Wireless Communications assembles coverage on all aspects of MIMO technology along with up-to-date information on key related issues. Contributors from leading academic and industrial institutions around the world share their expertise and lend the book a global perspective. They lead you gradually from basic to more advanced concepts, from propagation modeling and performance analysis to space-time codes, various systems, implementation options and limitations, practical system development considerations, field trials, and network planning issues. Linking theoretical analysis to practical issues, the book does not limit itself to any specific standardization or research/industrial initiatives. MIMO is the catalyst for the next revolution in wireless systems, and MIMO System Technology for Wireless Communications lays a thorough and complete foundation on which to build the next and future generations of wireless networks.

Smart Antennas - Praveen Kumar Malik 2022

This book presents the latest techniques for the design of antenna, focusing specifically on the microstrip antenna. The authors discuss antenna structure, defected ground, MIMO, and fractal design. The book provides the design of microstrip antenna in terms of latest applications and uses in areas like IoT and device-to-device communication. The book also provides the current methods and techniques used for the enhancement of the performance parameters of the microstrip antenna. Chapters enhance the knowledge and skills of students and researchers in the latest in the communications world like IoT, D2D, satellite, wearable devices etc. The authors discuss applications such as microwave imaging, medical implants, hyperthermia treatments, and wireless wellness monitoring and how a decrease in size of antenna help facilitate application potential. Provides the latest techniques used for the design of antenna in terms of its structure, defected ground, MIMO and fractal design; Outlines steps to resolve issues with designing antenna, including the latest design and design parameters for microstrip antenna; Presents the design of conformal and miniaturized antenna structures for various applications.

Energy Efficiency in Communications and Networks - Sameh Gobriel 2012-04-04

The topic of "Energy Efficiency in Communications and Networks" attracts growing attention due to economical and environmental reasons. The amount of power consumed by information and communication technologies (ICT) is rapidly increasing, as well as the energy bill of service providers. According to a number of studies, ICT alone is responsible for a percentage which varies from 2% to 10% of the world power consumption. Thus, driving rising cost and sustainability concerns about the energy footprint of the IT infrastructure. Energy-efficiency is an aspect that until recently was only considered for battery driven devices. Today we see energy-efficiency becoming a pervasive issue that will need to be considered in all technology areas from device technology to systems management. This book is seeking to provide a compilation of novel research contributions on hardware design, architectures, protocols and algorithms that will improve the energy efficiency of

communication devices and networks and lead to a more energy proportional technology infrastructure.
Orthogonal Frequency Division Multiplexing Based Medium Access Under Rate Constraints - Thomas Deckert 2007

Visible Light Communication - Suseela Vappangi 2021-08-11
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
Space-time Codes and MIMO Systems - Mohinder Jankiraman 2004
Annotation "This resource takes professionals step by step from the basics of MIMO through various coding techniques, to critical topics such as multiplexing and packet transmission. Practical examples are emphasized and mathematics is kept to a minimum, so readers can quickly and thoroughly understand the essentials of MIMO. The book takes a systems view of MIMO technology that helps professionals analyze the benefits and drawbacks of any MIMO system."--BOOK JACKET.Title Summary field provided by Blackwell North America, Inc. All Rights Reserved.
RF Imperfections in High-rate Wireless Systems - Tim Schenk 2008-01-29
This is one of the first books on the emerging research topic of digital compensation of RF imperfections. The book presents a new multidisciplinary vision on the design of wireless communication systems. In this approach the imperfections of the RF front-ends are accepted and digital signal processing algorithms are designed to suppress their impact on system performance. The book focuses on multiple-antenna orthogonal frequency division multiplexing (MIMO OFDM).
Effect of Slow Fading and Adaptive Modulation on TCP/UDP Performance of High-speed Packet Wireless Networks - Xuanming Dong 2006
High speed data wireless networks in multipath environments suffer channel impairment from many sources such as thermal noise, path loss, shadowing, and fading. In particular, short-term fading caused by mobility imposes irreducible error floor bounds on system performance. We study the effect of fading on the performance of the widely used TCP/UDP protocol, and investigate how to improve TCP performance over fading channels. Our solutions target upcoming mobile wireless systems such as IEEE 802.16e wireless MANs "Metropolitan Area Networks" where adaptive modulation is enabled and the underlying medium access scheme is On-Demand Time Division Multiple Access "On-Demand TDMA". Adaptive modulation is used in the new generation of wireless systems to increase the system throughput and significantly improve spectral effciency by matching parameters of the physical layer to the time-varying fading channels. Most high-rate applications for such wireless systems rely on the reliable service provided by TCP protocol. The effect of adaptive modulation on TCP throughput is investigated. A semi-Markov chain model for TCP congestion/flow control behavior and a multi-state Markov chain model for Rayleigh fading channels are used together to derive the steady state throughput of TCP Tahoe and Reno. The theoretical prediction based on our analysis is consistent with simulation results using the network simulator NS2. The analytical and simulation results triggered the idea of cross-layer TCP protocol design for single-user scenarios. The fading parameters of wireless channels detected in the physical layer can be used to dynamically tune the parameters "such as packet length and advertised receiver window size" of the TCP protocol in the transport layer so that TCP throughput is improved. For multi-user scenarios, we study how multi-user diversity can be used to improve th.
Attachment Transmission in Wireless Networks - Lu Wang 2014-07-08
This brief presents the novel PHY layer technique, attachment transmission, which provides an extra control panel with minimum overhead. In addition to describing the basic mechanisms of this technique, this brief also illustrates the challenges, the theoretical model, implementation and numerous applications of attachment transmission. Extensive experiments demonstrate that attachment transmission is capable of exploiting and utilizing channel redundancy to deliver control information and thus it can provide significant support to numerous higher layer applications. The authors also address the critical problem of providing cost-effective coordination mechanisms for wireless design. The combination of new techniques and implementation advice makes this brief a valuable resource for researchers and professionals interested in wireless penetration and communication networks.
Proceedings of the Multi-Conference 2011 - Himanshu B. Soni 2011-06-06
The International Conference on Signals, Systems and Automation (ICSSA 2011) aims to spread awareness in the research and academic community regarding cutting-edge technological advancements revolutionizing the world. The main emphasis of this conference is on dissemination of information, experience, and research results on the current topics of interest through in-depth discussions and participation of researchers from all over the world. The objective is to provide a platform to scientists, research scholars, and industrialists for interacting and exchanging ideas in a number of research areas. This will facilitate communication among researchers in different fields of Electronics and Communication Engineering. The International Conference on Intelligent System and Data Processing (ICISD 2011) is organized to address various issues that will foster the creation of intelligent solutions in the future. The primary goal of the conference is to bring together worldwide leading researchers, developers, practitioners, and educators interested in advancing the state of the art in computational intelligence and data processing for exchanging knowledge that encompasses a broad range of disciplines among various distinct communities. Another goal is to promote scientific information interchange between researchers, developers, engineers, students, and practitioners working in India and abroad.
LTE - The UMTS Long Term Evolution - Stefania Sesia 2011-08-29
"Where this book is exceptional is that the reader will not just learn how LTE works but why it works" Adrian Scrase, ETSI Vice-President, International Partnership Projects Following on the success of the first edition, this book is fully updated, covering the latest additions to LTE and the key features of LTE-Advanced. This book builds on the success of its predecessor, offering the same comprehensive system-level understanding built on explanations of the underlying theory, now expanded to include complete coverage of Release 9 and the developing specifications for LTE-Advanced. The book is a collaborative effort of more than 40 key experts representing over 20 companies actively participating in the development of LTE, as well as academia. The book highlights practical implications, illustrates the expected performance, and draws comparisons with the well-known WCDMA/HSPA standards. The authors not only pay special attention to the physical layer, giving an insight into the fundamental concepts of OFDMA-FDMA and MIMO, but also cover the higher protocol layers and system architecture to enable the reader to gain an overall understanding of the system. Key New Features: Comprehensively updated with the latest changes of the LTE Release 8 specifications, including improved coverage of Radio Resource Management RF aspects and performance requirements Provides detailed coverage of the new LTE Release 9 features, including: eMBMS, dual-layer beamforming, user equipment positioning, home eNodeBs / femtocells and pico cells and self-optimizing networks Evaluates the LTE system performance Introduces LTE-Advanced, explaining its context and motivation, as well as the key new features including: carrier aggregation, relaying, high-order MIMO, and Cooperative Multi-Point transmission (CoMP). Includes an accompanying website containing a complete list of acronyms related to LTE and LTE-Advanced, with a brief description of each (http://www.wiley.com/go/sesia_theumts) This book is an invaluable reference for all research and development engineers involved in implementation of LTE or LTE-Advanced, as well as graduate and PhD students in wireless communications. Network operators, service providers and R&D managers will also find this book insightful.
Quality of Service Architectures for Wireless Networks: Performance Metrics and Management - Adibi, Sasan 2010-01-31

"This book further explores various issues and proposed solutions for the provision of Quality of Service (QoS) on the wireless networks"--Provided by publisher.

International Conference on Remote Sensing and Wireless Communications (RSWC 2014) - John Kong 2014-02-19

International Conference on Remote Sensing and Wireless Communications (RSWC 2014) will be held from February 22nd to 23rd, 2014 in Shanghai, China. RSWC 2014 will bring together top researchers from Asian Pacific areas, North America, Europe and around the world to exchange research results and address open issues in all aspects of Remote Sensing and Wireless Communications. The RSWC 2014 welcomes the submission of original full research papers, short papers, posters, workshop proposals, tutorials, and industrial professional reports.

Advances in Intelligent Computing - De-Shuang Huang 2005-08-11

The two-volume set LNCS 3644 and LNCS 3645 constitutes the refereed proceedings of the International Conference on Intelligent Computing, ICIC 2005, held in Hefei, China, in August 2005. The program committee selected 215 carefully revised full papers for presentation in two volumes from over 2000 submissions, based on rigorous peer reviews. The first volume includes all the contributions related with perceptual and pattern recognition, informatics theories and applications computational neuroscience and bioscience, models and methods, and learning systems. The second volume collects the papers related with genomics and proteomics, adaptation and decision making, applications and hardware, and other applications.

Information Science and Electronic Engineering - Dongxing Wang 2016-12-08

Information Science and Electronic Engineering is a collection of contributions drawn from the International Conference of Electronic Engineering and Information Science (ICEEIS 2016) held January 4-5, 2016 in Harbin, China. The papers in this proceedings volume cover various topics, including: - Electronic Engineering - Information Science and Information Technologies - Computational Mathematics and Data Mining - Image Processing and Computer Vision - Communication and Signal Processing - Control and Automation of Mechatronics - Methods, Devices and Systems for Measurement and Monitoring - Engineering of Weapon Systems - Mechanical Engineering and Material Science - Technologies of Processing. The content of this proceedings volume will be of interest to professionals and academics in the fields of Electronic Engineering, Computer Science and Mechanical Engineering.