

Master Thesis Ofdm Based Power Line Communication

Recognizing the quirk ways to get this ebook **master thesis ofdm based power line communication** is additionally useful. You have remained in right site to start getting this info. get the master thesis ofdm based power line communication associate that we allow here and check out the link.

You could buy lead master thesis ofdm based power line communication or acquire it as soon as feasible. You could speedily download this master thesis ofdm based power line communication after getting deal. So, gone you require the ebook swiftly, you can straight acquire it. Its consequently entirely simple and in view of that fats, isnt it? You have to favor to in this circulate

Millimeter Wave Wireless Communications Theodore S. Rappaport 2014-09-18 The Definitive, Comprehensive Guide to Cutting-Edge Millimeter Wave Wireless Design "This is a great book on mmWave systems that covers many aspects of the technology targeted for beginners all the way to the advanced users. The authors are some of the most credible scholars I know of who are well respected by the industry. I highly recommend studying this book in detail." –Ali Sadri, Ph.D., Sr. Director, Intel Corporation, MCG mmWave Standards and Advanced Technologies Millimeter wave (mmWave) is today's breakthrough frontier for emerging wireless mobile cellular networks, wireless local area networks, personal area networks, and vehicular communications. In the near future, mmWave products, systems, theories, and devices will come together to deliver mobile data rates thousands of times faster than today's existing cellular and WiFi networks. In Millimeter Wave Wireless Communications, four of the field's pioneers draw on their immense experience as researchers, entrepreneurs, inventors, and consultants, empowering engineers at all levels to succeed with mmWave. They deliver exceptionally clear and useful guidance for newcomers, as well as the first complete desk reference for design experts. The authors explain mmWave signal propagation, mmWave circuit design, antenna designs, communication theory, and current standards (including IEEE 802.15.3c, Wireless HD, and ECMA/WiMedia). They cover comprehensive mmWave wireless design issues, for 60 GHz and other mmWave bands, from channel to antenna to receiver, introducing emerging design techniques that will be invaluable for research engineers in both industry and academia. Topics include Fundamentals: communication theory, channel propagation, circuits, antennas, architectures, capabilities, and applications Digital communication: baseband signal/channel models, modulation, equalization, error control coding, multiple input multiple output (MIMO) principles, and hardware architectures Radio wave propagation characteristics: indoor and outdoor applications Antennas/antenna arrays, including on-chip and in-package antennas, fabrication, and packaging Analog circuit design: mmWave transistors, fabrication, and transceiver design

approaches Baseband circuit design: multi-gigabit-per-second, high-fidelity DAC and ADC converters Physical layer: algorithmic choices, design considerations, and impairment solutions; and how to overcome clipping, quantization, and nonlinearity Higher-layer design: beam adaptation protocols, relaying, multimedia transmission, and multiband considerations 60 GHz standardization: IEEE 802.15.3c for WPAN, Wireless HD, ECMA-387, IEEE 802.11ad, Wireless Gigabit Alliance (WiGig)

Position, Navigation, and Timing Technologies in the 21st Century, Volumes 1 and 2 Y. Jade Morton 2020-12-17 Covers the latest developments in PNT technologies, including integrated satellite navigation, sensor systems, and civilian applications Featuring sixty-four chapters that are divided into six parts, this two-volume work provides comprehensive coverage of the state-of-the-art in satellite-based position, navigation, and timing (PNT) technologies and civilian applications. It also examines alternative navigation technologies based on other signals-of-opportunity and sensors and offers a comprehensive treatment on integrated PNT systems for consumer and commercial applications. Volume 1 of *Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor Systems, and Civil Applications* contains three parts and focuses on the satellite navigation systems, technologies, and engineering and scientific applications. It starts with a historical perspective of GPS development and other related PNT development. Current global and regional navigation satellite systems (GNSS and RNSS), their inter-operability, signal quality monitoring, satellite orbit and time synchronization, and ground- and satellite-based augmentation systems are examined. Recent progresses in satellite navigation receiver technologies and challenges for operations in multipath-rich urban environment, in handling spoofing and interference, and in ensuring PNT integrity are addressed. A section on satellite navigation for engineering and scientific applications finishes off the volume. Volume 2 of *Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor Systems, and Civil Applications* consists of three parts and addresses PNT using alternative signals and sensors and integrated PNT technologies for consumer and commercial applications. It looks at PNT using various radio signals-of-opportunity, atomic clock, optical, laser, magnetic field, celestial, MEMS and inertial sensors, as well as the concept of navigation from Low-Earth Orbiting (LEO) satellites. GNSS-INS integration, neuroscience of navigation, and animal navigation are also covered. The volume finishes off with a collection of work on contemporary PNT applications such as survey and mobile mapping, precision agriculture, wearable systems, automated driving, train control, commercial unmanned aircraft systems, aviation, and navigation in the unique Arctic environment. In addition, this text: Serves as a complete reference and handbook for professionals and students interested in the broad range of PNT subjects Includes chapters that focus on the latest developments in GNSS and other navigation sensors, techniques, and applications Illustrates interconnecting relationships between various types of technologies in order to assure more protected, tough, and accurate PNT *Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor*

Systems, and Civil Applications will appeal to all industry professionals, researchers, and academics involved with the science, engineering, and applications of position, navigation, and timing technologies. pnt21book.com

Constant Envelope OFDM Phase Modulation Steve Charles Thompson 2005

The Orthogonal Frequency Division Multiplexing (OFDM). Introduction and explanation of five different types of techniques Dr. Lokesh Chikkananjaiiah 2021-02-25 Thesis (M.A.) from the year 2019 in the subject Electrotechnology, grade: 9, , language: English, abstract: The Orthogonal Frequency Division Multiplexing (OFDM) is an important aspect of multicarrier digital data transmission system where a single data stream is transmitted into a several number of lower rates subcarrier signals. In this thesis, there are five different types of the techniques introduced to strengthen the communication quality and capacity. This kind of new standard of transmission of data is the first one to perform with OFDM in data packet based communication system. In wireless communication network, the abstraction of parallel transmission of data symbols is implemented to attain high throughput and effective transmission quality. The OFDM is a method to deal with parallel transmission.

Crosstalk Mitigation Techniques for Digital Subscriber Line Systems Monique Dungen 2016-03-11 To allow DSL systems to support an always increasing amount of high-rate applications and run them stably, high data rates need to be guaranteed at a limited amount of computational complexity available for crosstalk mitigation. In this dissertation, first a channel estimation technique and channel adaptation procedures are presented as sufficiently accurate channel state information is the basis for many crosstalk reduction methods. The proposed techniques lead to increased performance of DSL systems. In the second and main part, crosstalk mitigation methods to fulfill data rate constraints in DSL networks are introduced. They achieve the high data rate targets at a low computational complexity. Die Übertragungsrate moderner DSL Systeme ist durch Übersprechen begrenzt, dennoch soll eine steigende Zahl von hochratigen Applikationen unterstützt werden. Um deren stabile Nutzung zu ermöglichen, müssen hohe Datenraten auch bei begrenztem Rechenaufwand für die Übersprechreduzierung garantiert werden. Diese Dissertation präsentiert zuerst leistungsfähige Techniken zur Kanalschätzung, da eine Kanalkennntnis für viele Reduktionsverfahren grundlegend ist. Im Hauptteil der Arbeit werden Methoden zur Reduzierung von Übersprechen gezeigt, mit denen Datenratenanforderungen in DSL Netzwerken erfüllt werden können. Sie erlauben ein Erreichen der Datenratenziele bei geringer benötigter Rechenkomplexität.

Wireless Communication and Sensor Network Salah Bourenane 2016-06-29 This proceedings volume collects the most up-to-date, comprehensive and state-of-the-art knowledge on wireless communication, sensor network, network technologies, services and application. Written by world renowned researchers, each chapter is original in content, featuring high-impact presentations and late-breaking contributions. Researchers and practitioners will find this edition a useful resource material and an inspirational read. Contents:Wireless

Communications Network Technologies Services and Application Readership: Researchers, academics, professionals and graduate students in neural networks/networking, electrical & electronic engineering, and condensed matter physics.

Broadband Powerline Communications Halid Hrasnica 2004-07-30 Broadband Powerline Communications: Network Design covers the applications of broadband PLC systems in low-voltage supply networks, a promising candidate for the realization of cost effective solutions for "last mile" communications networks. There are many activities surrounding the development and application of PLC technology in the access area, particularly because of strong interest of new network providers after the deregulation of telecommunications market. Nowadays, there are no existing standards for broadband PLC networks, which use a frequency range up to 30 MHz. This book includes relevant and timely information regarding broadband PLC systems and especially PLC access networks and contributions to the design aspects of broadband PLC access systems and their network components. This book: Offers explanations on how broadband PLC networks are realized, what the important characteristics for the transmission on electrical power grids are, and which implementation solutions have been recently considered for the realization of broadband PLC systems. Considers various system realizations, disturbance scenarios and their impact the transmission in PLC networks, electro-magnetic compatibility, applied modulation schemes, coding, and error handling methods. Pays particular attention to the specifics of the PLC MAC layer and its protocols, as well as the modelling and performance evaluation of broadband PLC networks.

Dissertation Abstracts International 2008

Power Line Communications Lutz Lampe 2016-04-14 This second edition of Power Line Communications will show some adjustments in content including new material on PLC for home and industry, PLC for multimedia, PLC for smart grid and PLC for vehicles. Additional chapters include coverage of Channel Characterization, Electromagnetic Compatibility, Coupling, and Digital Transmission Techniques. This book will provide the reader with a wide coverage of the major developments within the field. With contributions from some of the most active researchers on PLC, the book brings together a wealth of international experts on specific PLC topics.

Wiley Encyclopedia of Telecommunications, Volume 4 John G. Proakis 2003 "Contains 275 tutorial articles focused on modern telecommunications topics. The contents include articles on communication networks, source coding and decoding, channel coding and decoding, modulation and demodulation, optical communications, satellite communications, underwater acoustic communications, radio propagation, antennas, multiuser communications, magnetic storage systems, and a variety of standards"--V.1, p. v.

International Conference on Computer Applications 2012 :: Volume 03 Kokula Krishna Hari K

New Directions in Wireless Communications Systems Athanasios G. Kanatas 2017-10-16 Beyond 2020, wireless communication systems will have to support more than 1,000 times the traffic volume of today's systems. This extremely high traffic load is a major issue faced by 5G designers and researchers. This challenge will be met by a combination of parallel techniques that will use more spectrum more flexibly, realize higher spectral efficiency, and densify cells. Novel techniques and paradigms must be developed to meet these goals. The book addresses diverse key-point issues of next-generation wireless communications systems and identifies promising solutions. The book's core is concentrated to techniques and methods belonging to what is generally called radio access network.

Mobile Multimedia Communications: Concepts, Applications, and Challenges Karmakar, Gour 2007-11-30 With rapid growth of the Internet, the applications of multimedia are burgeoning in every aspect of human life including communication networks and wireless and mobile communications. Mobile Multimedia Communications: Concepts, Applications and Challenges captures defining research on all aspects and implications of the accelerated progress of mobile multimedia technologies. Covered topics include fundamental network infrastructures, modern communication features such as wireless and mobile multimedia protocols, personal communication systems, mobility and resource management, and security and privacy issues. A complete reference to topics driving current and potential future development of mobile technologies, this essential addition to library collections will meet the needs of researchers in a variety of related fields.

Passive, Active, and Digital Filters Wai-Kai Chen 2018-10-08 Upon its initial publication, The Circuits and Filters Handbook broke new ground. It quickly became the resource for comprehensive coverage of issues and practical information that can be put to immediate use. Not content to rest on his laurels, in addition to updating the second edition, editor Wai-Kai Chen divided it into tightly-focused texts that made the information easily accessible and digestible. These texts have been revised, updated, and expanded so that they continue to provide solid coverage of standard practices and enlightened perspectives on new and emerging techniques. *Passive, Active, and Digital Filters* provides an introduction to the characteristics of analog filters and a review of the design process and the tasks that need to be undertaken to translate a set of filter specifications into a working prototype. Highlights include discussions of the passive cascade synthesis and the synthesis of LCM and RC one-port networks; a summary of two-port synthesis by ladder development; a comparison of the cascade approach, the multiple-loop feedback topology, and ladder simulations; an examination of four types of finite wordlength effects; and coverage of methods for designing two-dimensional finite-extent impulse response (FIR) discrete-time filters. The book includes coverage of the basic building blocks involved in low- and high-order filters, limitations and practical design considerations, and a brief

discussion of low-voltage circuit design. Revised Chapters: Sensitivity and Selectivity Switched-Capacitor Filters FIR Filters IIR Filters VLSI Implementation of Digital Filters Two-Dimensional FIR Filters Additional Chapters: 1-D Multirate Filter Banks Directional Filter Banks Nonlinear Filtering Using Statistical Signal Models Nonlinear Filtering for Image Denoising Video Demosaicking Filters This volume will undoubtedly take its place as the engineer's first choice in looking for solutions to problems encountered when designing filters.

The Circuits and Filters Handbook (Five Volume Slipcase Set) Wai-Kai Chen 2018-12-14 Standard-setting, groundbreaking, authoritative, comprehensive—these often overused words perfectly describe The Circuits and Filters Handbook, Third Edition. This standard-setting resource has documented the momentous changes that have occurred in the field of electrical engineering, providing the most comprehensive coverage available. More than 150 contributing experts offer in-depth insights and enlightened perspectives into standard practices and effective techniques that will make this set the first—and most likely the only—tool you select to help you with problem solving. In its third edition, this groundbreaking bestseller surveys accomplishments in the field, providing researchers and designers with the comprehensive detail they need to optimize research and design. All five volumes include valuable information on the emerging fields of circuits and filters, both analog and digital. Coverage includes key mathematical formulas, concepts, definitions, and derivatives that must be mastered to perform cutting-edge research and design. The handbook avoids extensively detailed theory and instead concentrates on professional applications, with numerous examples provided throughout. The set includes more than 2500 illustrations and hundreds of references. Available as a comprehensive five-volume set, each of the subject-specific volumes can also be purchased separately.

Smart and Sustainable Engineering for Next Generation Applications Peter Fleming 2019-05-08 This book reports on advanced theories and methods in two related engineering fields: electrical and electronic engineering, and communications engineering and computing. It highlights areas of global and growing importance, such as renewable energy, power systems, mobile communications, security and the Internet of Things (IoT). The contributions cover a number of current research issues, including smart grids, photovoltaic systems, wireless power transfer, signal processing, 4G and 5G technologies, IoT applications, mobile cloud computing and many more. Based on the proceedings of the Second International Conference on Emerging Trends in Electrical, Electronic and Communications Engineering (ELECOM 2018), held in Mauritius from November 28 to 30, 2018, the book provides graduate students, researchers and professionals with a snapshot of the state-of-the-art and a source of new ideas for future research and collaborations.

Emulation of Narrowband Powerline Data Transmission Channels and Evaluation of PLC Systems Wenqing Liu 2013

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

Wireless Communications for Power Substations: RF Characterization and Modeling Basile L. Agba 2018-06-08 This book consists of the identification, characterization, and modeling of electromagnetic interferences in substations for the deployment of wireless sensor networks. The authors present in chapter 3 the measurement setup to record sequences of impulsive noise samples in the ISM band of interest. The setup can measure substation impulsive noise, in wide band, with enough samples per time window and enough precision to allow a statistical study of the noise. During the measurement campaign, the authors recorded around 120 noise sequences in different substations and for four ranges of equipment voltage, which are 25 kV, 230 kV, 315 kV and 735 kV. A characterization process is proposed, by which physical characteristics of partial discharge can be measured in terms of first- and second-order statistics. From the measurement campaign, the authors infer the characteristics of substation impulsive noise as a function of the substation equipment voltage, and can provide representative parameters for the four voltage ranges and for several existing impulsive noise models. The authors investigate in chapters 4 and 5 the modeling of electromagnetic interferences caused by partial discharge sources. First, the authors propose a complete and coherent approach model that links physical characteristics of high-voltage installations to the induced radio-interference spectra of partial discharge sources. The goodness-of-fit of the proposed physical model has been measured based on some interesting statistical metrics. This allows one to assess the effectiveness of the authors' approach in terms of first- and second-order statistics. Chapter 6 proposes a model based on statistical approach. Indeed, substation impulsive noise is composed of correlated impulses, which would require models with memory in order to replicate a similar correlation. Among different models, we have configured a Partitioned Markov Chain (PMC) with 19 states (one state for the background noise and 18 states for the impulse); this

Markov-Gaussian model is able to generate impulsive noise with correlated impulse samples. The correlation is observable on the impulse duration and the power spectrum of the impulses. Our PMC model provides characteristics that are more similar to the characteristics of substation impulsive noise in comparison with other models, in terms of time and frequency response, as well as Probability Density Functions (PDF). Although PMC represents reliably substation impulsive noise, the model remains complex in terms of parameter estimation due to a large number of Markov states, which can be an obstacle for future wireless system design. In order to simplify the model, the authors decrease the number of states to 7 by assigning one state to the background noise and 6 states to the impulse and we call this model PMC-6. PMC-6 can generate realistic impulses and can be easily implemented in a receiver in order to mitigate substation impulsive noise. Representative parameters are provided in order to replicate substation impulsive noise for different voltage ranges (25-735 kV). Chapter 7, a generalized radio-noise model for substations is proposed, in which there are many discharges sources that are randomly distributed over space and time according to the Poisson field of interferers approach. This allows for the identification of some interesting statistical properties of moments, cumulants and probability distributions. These can, in turn, be utilized in signal processing algorithms for rapid partial discharge's identification, localization, and impulsive noise mitigation techniques in wireless communications in substations. The primary audience for this book is the electrical and power engineering industry, electricity providers and companies who are interested in substation automation systems using wireless communication technologies for smart grid applications. Researchers, engineers and students studying and working in wireless communication will also want to buy this book as a reference.

Multi-Carrier Digital Communications Ahmad R.S. Bahai 2004-10-07 This second edition of Multi-Carrier Digital Communications: Theory and Applications of OFDM begins with a brief overview of multi-carrier communications. The authors then focus on the bandwidth efficient technology of OFDM, in particular the DSP techniques that have made the modulation format practical. Several chapters describe and analyze the sub-systems of an OFDM implementation, such as clipping, synchronization channel estimation, equalization, and coding. Analysis of performance over channels with various impairments is presented. The book continues with descriptions of three very important and diverse applications of OFDM that have been standardized and are now being deployed: ADSL, digital broadcasting, and wireless LANs for multi-Mbps communications. Finally, the book concludes with describing the OFDM-based multiple access techniques, ultra wideband technology, and WiMAX.

Cyclostationary Processes and Time Series Antonio Napolitano 2019-10-24 Many processes in nature arise from the interaction of periodic phenomena with random phenomena. The results are processes that are not periodic, but whose statistical functions are periodic functions of time. These processes are called cyclostationary and are an appropriate mathematical model for signals encountered in many fields including communications, radar, sonar, telemetry,

acoustics, mechanics, econometrics, astronomy, and biology. Cyclostationary Processes and Time Series: Theory, Applications, and Generalizations addresses these issues and includes the following key features. Presents the foundations and developments of the second- and higher-order theory of cyclostationary signals Performs signal analysis using both the classical stochastic process approach and the functional approach for time series Provides applications in signal detection and estimation, filtering, parameter estimation, source location, modulation format classification, and biological signal characterization Includes algorithms for cyclic spectral analysis along with Matlab/Octave code Provides generalizations of the classical cyclostationary model in order to account for relative motion between transmitter and receiver and describe irregular statistical cyclicity in the data

Broadband Powerline Communications Halid Hrasnica 2005-01-14 Broadband Powerline Communications: Network Design covers the applications of broadband PLC systems in low-voltage supply networks, a promising candidate for the realization of cost effective solutions for "last mile" communications networks. There are many activities surrounding the development and application of PLC technology in the access area, particularly because of strong interest of new network providers after the deregulation of telecommunications market. Nowadays, there are no existing standards for broadband PLC networks, which use a frequency range up to 30 MHz. This book includes relevant and timely information regarding broadband PLC systems and especially PLC access networks and contributions to the design aspects of broadband PLC access systems and their network components. This book: Offers explanations on how broadband PLC networks are realized, what the important characteristics for the transmission on electrical power grids are, and which implementation solutions have been recently considered for the realization of broadband PLC systems. Considers various system realizations, disturbance scenarios and their impact the transmission in PLC networks, electro-magnetic compatibility, applied modulation schemes, coding, and error handling methods. Pays particular attention to the specifics of the PLC MAC layer and its protocols, as well as the modelling and performance evaluation of broadband PLC networks.

Index to Theses with Abstracts Accepted for Higher Degrees by the Universities of Great Britain and Ireland and the Council for National Academic Awards 2008 Theses on any subject submitted by the academic libraries in the UK and Ireland.

Performance evaluation of channel estimation techniques for LTE downlink system
Kahsay Meresa

Compressive Sensing in Healthcare Mahdi Khosravy 2020-05-18 Compressive Sensing in Healthcare, part of the Advances in Ubiquitous Sensing Applications for Healthcare series gives a review on compressive sensing techniques in a practical way, also presenting deterministic compressive sensing techniques that can be used in the field. The focus of the book is on healthcare applications for this technology. It is intended for both the creators of this

technology and the end users of these products. The content includes the use of EEG and ECG, plus hardware and software requirements for building projects. Body area networks and body sensor networks are explored. Provides a toolbox for compressive sensing in health, presenting both mathematical and coding information Presents an intuitive introduction to compressive sensing, including MATLAB tutorials Covers applications of compressive sensing in health care

Smart Grids and Their Communication Systems Ersan Kabalci 2018-09-01 The book presents a broad overview of emerging smart grid technologies and communication systems, offering a helpful guide for future research in the field of electrical engineering and communication engineering. It explores recent advances in several computing technologies and their performance evaluation, and addresses a wide range of topics, such as the essentials of smart grids for fifth generation (5G) communication systems. It also elaborates the role of emerging communication systems such as 5G, internet of things (IoT), IEEE 802.15.4 and cognitive radio networks in smart grids. The book includes detailed surveys and case studies on current trends in smart grid systems and communications for smart metering and monitoring, smart grid energy storage systems, modulations and waveforms for 5G networks. As such, it will be of interest to practitioners and researchers in the field of smart grid and communication infrastructures alike.

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.

Ofdm Based Relay Systems for Future Wireless Communications Milica Pejanovic-Djurisic 2022-09-01 Relay systems have become a subject of intensive research interest over the recent years, as it is recognized that they can improve performances and extend the coverage area of wireless communication systems. Special attention has been dedicated to them since the proposal appeared for their implementation in mobile cellular systems. Numerous researches conducted after that proposal have enabled incorporation of OFDM based relay systems in both accepted standards for IMT-Advanced systems. Nowadays, researches are ongoing with the aim to define new solutions for performance improvement of the standardized OFDM relay systems for cellular networks and one of the interesting solutions is implementation of subcarrier permutation (SCP) at the relay (R) station. The book OFDM based relay systems for future wireless communications presents a comprehensive research results in analyzing behavior and performance of the OFDM based relay systems with SCP. Dual-hop relay scenario with three communication terminals, and no direct link between the source (S) and the destination (D) has been analyzed, as it is compliant with the accepted solutions for IMT-Advanced systems. The book includes performance analysis and performance comparison of OFDM based: • amplify-and-forward (AF) relay systems with fixed gain (FG), • amplify-and-forward (AF) relay systems with variable gain (VG), • decode-and-forward (DF) relay systems, each including two SCP schemes, known to maximize the system capacity and/or improve the bit error rate (BER) performances. Performance comparisons have enabled definition of optimal solutions for the future wireless communication systems in a given conditions, and for the given optimality criteria. OFDM based relay systems for future wireless communications contains recent research results in this area and is ideal for the academic staff and master/research students in area of mobile communication systems, as well as for the personnel in communication industry.

Nature-Inspired Computing Applications in Advanced Communication Networks

Gupta, Govind P. 2019-12-27 With the rapid growth of technology in society, communication networks have become a heavily researched topic. Implementing these advanced systems is a challenge, however, due to the abundance of optimization problems within these networks. The use of meta-heuristic algorithms and nature-inspired computing has become a prevalent technique among researchers for solving these complex problems within communication networks. Despite its popularity, this specific computing technique lacks the appropriate amount of research that is needed for professionals to grasp a definite understanding. Nature-Inspired Computing Applications in Advanced Communication Networks is a collection of innovative research on the methods and applications of natural computation techniques and algorithms within communication systems such as wireless sensor networks, vehicular adhoc networks, and internet of things. While highlighting topics including mobile sensor deployment, routing optimization, and sleep scheduling, this book is ideally designed for researchers, network professionals, computer scientists, mathematicians, developers, scholars, educators, and students seeking to enhance their understanding of nature-inspired computing and its solutions within various advanced communication networks.

MIMO Power Line Communications Lars Torsten Berger 2014-02-18 One of the first publications of its kind in the exciting field of multiple input multiple output (MIMO) power line communications (PLC), *MIMO Power Line Communications: Narrow and Broadband Standards, EMC, and Advanced Processing* contains contributions from experts in industry and academia, making it practical enough to provide a solid understanding of how PLC technologies work, yet scientific enough to form a base for ongoing R&D activities. This book is subdivided into five thematic parts. Part I looks at narrow- and broadband channel characterization based on measurements from around the globe. Taking into account current regulations and electromagnetic compatibility (EMC), part II describes MIMO signal processing strategies and related capacity and throughput estimates. Current narrow- and broadband PLC standards and specifications are described in the various chapters of part III. Advanced PLC processing options are treated in part IV, drawing from a wide variety of research areas such as beamforming/precoding, time reversal, multi-user processing, and relaying. Lastly, part V contains case studies and field trials, where the advanced technologies of tomorrow are put into practice today. Suitable as a reference or a handbook, *MIMO Power Line Communications: Narrow and Broadband Standards, EMC, and Advanced Processing* features self-contained chapters with extensive cross-referencing to allow for a flexible reading path.

The Handbook of Computer Networks, Key Concepts, Data Transmission, and Digital and Optical Networks Hossein Bidgoli 2008 A complete and in-depth introduction to computer networks and networking In this first volume of *The Handbook of Computer Networks*, readers will get a complete overview of the key concepts of computers networks, data transmission, and digital and optical networks. Providing a comprehensive examination of computer networks, the book is designed for both undergraduate students and professionals working in a variety of computer network-dependent industries. With input from over 270 experts in the field, the text offers an easy-to-follow progression through each topic and focuses on fields and technologies that have widespread application in the real world.

Research on the Key Technologies in Narrowband Interference and Impulsive Noise Mitigation and Cancellation Sicong Liu 2020-09-10 This book summarizes the authors' latest research on narrowband interference and impulsive noise mitigation and cancellation, including (i) mitigating the impacts of NBI on synchronization; (ii) improving time-frequency interleaving performance under NBI and IN; (iii) accurately recovering and eliminating NBI and IN. The complicated, random and intensive narrowband interference and impulsive noise are a serious bottleneck of the next-generation wireless communications and Internet of things. This book also proposes effective and novel frameworks and algorithms, which will significantly improve the capability of mitigating and eliminating NBI and IN in the next-generation broadband communications systems. This book not only presents thorough theoretical models and algorithm design guidelines, but also provides adequate simulation and experimental engineering methods and results. The book is a valuable reference for those engaged in theoretical study, algorithm design and engineering practice in related fields,

such as wireless communications, smart lighting, IoT and smart grid communications.

A Practical Guide to Power-line Communication Christina Vlachou 2022-04-30 A rigorous description of the theory and practice of power-line communication, which identifies the key characteristics that impact on performance and security. Ideal for university researchers and professional engineers designing PLC or hybrid devices and networks.

Power Line Communications Hendrik C. Ferreira 2011-07-22 Power Line Communications (PLC) is a promising emerging technology, which has attracted much attention due to the wide availability of power distribution lines. This book provides a thorough introduction to the use of power lines for communication purposes, ranging from channel characterization, communications on the physical layer and electromagnetic interference, through to protocols, networks, standards and up to systems and implementations. With contributions from many of the most prominent international PLC experts from academia and industry, Power Line Communications brings together a wealth of information on PLC specific topics that provide the reader with a broad coverage of the major developments within the field. Acts as a single source reference guide to PLC collating information that is widely dispersed in current literature, such as in research papers and standards. Covers both the state of the art, and ongoing research topics. Considers future developments and deployments of PLC

Automatic Transmit Power Control for Power Efficient Communications in UAS. Wantao Li 2020 Nowadays, unmanned aerial vehicles (UAV) have become one of the most popular tools that can be used in commercial, scientific, agricultural and military applications. As drones become faster, smaller and cheaper, with the ability to add payloads, the usage of the drone can be versatile. In most of the cases, unmanned aerials systems (UAS) are equipped with a wireless communication system to establish a link with the ground control station to transfer the control commands, video stream, and payload data. However, with the limited onboard calculation resources in the UAS, and the growing size and volume of the payload data, computational complex signal processing such as deep learning cannot be easily done on the drone. Hence, in many drone applications, the UAS is just a tool for capturing and storing data, and then the data is post-processed off-line in a more powerful computing device. The other solution is to stream payload data to the ground control station (GCS) and let the powerful computer on the ground station to handle these data in real-time. With the development of communication techniques such as orthogonal frequency-division multiplexing (OFDM) and multiple-input multiple-output (MIMO) transmissions, it is possible to increase the spectral efficiency over large bandwidths and consequently achieve high transmission rates. However, the drone and the communication system are usually being designed separately, which means that regardless of the situation of the drone, the communication system is working independently to provide the data link. Consequently, by taking into account the position of the drone, the communication system has some room to optimize the link budget efficiency. In this master thesis, a power-efficient

wireless communication downlink for UAS has been designed. It is achieved by developing an automatic transmit power control system and a custom OFDM communication system. The work has been divided into three parts: research of the drone communication system, an optimized communication system design and finally, FPGA implementation. In the first part, an overview on commercial drone communication schemes is presented and discussed. The advantages and disadvantages shown are the source of inspiration for improvement. With these ideas, an optimized scheme is presented. In the second part, an automatic transmit power control system for UAV wireless communication and a power-efficient OFDM downlink scheme are proposed. The automatic transmit power control system can estimate the required power level by the relative position between the drone and the GCS and then inform the system to adjust the power amplifier (PA) gain and power supply settings. To obtain high power efficiency for different output power levels, a searching strategy has been applied to the PA testbed to find out the best voltage supply and gain configurations. Besides, the OFDM signal generation developed in Python can encode data bytes to the baseband signal for testing purpose. Digital predistortion (DPD) linearization has been included in the transmitter's design to guarantee the signal linearity. In the third part, two core algorithms: IFFT and LUT-based DPD, have been implemented in the FPGA platform to meet the real-time and high-speed I/O requirements. By using the high-level synthesis design process provided by Xilinx Corp, the algorithms are implemented as reusable IP blocks. The conclusion of the project is given in the end, including the summary of the proposed drone communication system and envisioning possible future lines of research.

Cognitive Radio Communications and Networks Alexander M. Wyglinski 2009-11-13
Cognitive Radio Communications and Networks gives comprehensive and balanced coverage of the principles of cognitive radio communications, cognitive networks, and details of their implementation, including the latest developments in the standards and spectrum policy. Case studies, end-of-chapter questions, and descriptions of various platforms and test beds, together with sample code, give hands-on knowledge of how cognitive radio systems can be implemented in practice. Extensive treatment is given to several standards, including IEEE 802.22 for TV White Spaces and IEEE SCC41 Written by leading people in the field, both at universities and major industrial research laboratories, this tutorial text gives communications engineers, R&D engineers, researchers, undergraduate and post graduate students a complete reference on the application of wireless communications and network theory for the design and implementation of cognitive radio systems and networks Each chapter is written by internationally renowned experts, giving complete and balanced treatment of the fundamentals of both cognitive radio communications and cognitive networks, together with implementation details Extensive treatment of the latest standards and spectrum policy developments enables the development of compliant cognitive systems Strong practical orientation – through case studies and descriptions of cognitive radio platforms and testbeds – shows how real world cognitive radio systems and network architectures have been built Alexander M. Wyglinski is an Assistant Professor of Electrical and Computer

Engineering at Worcester Polytechnic Institute (WPI), Director of the WPI Limerick Project Center, and Director of the Wireless Innovation Laboratory (WI Lab) Each chapter is written by internationally renowned experts, giving complete and balanced treatment of the fundamentals of both cognitive radio communications and cognitive networks, together with implementation details Extensive treatment of the latest standards and spectrum policy developments enables the development of compliant cognitive systems Strong practical orientation – through case studies and descriptions of cognitive radio platforms and testbeds – shows how "real world" cognitive radio systems and network architectures have been built

Wireless Communications and Networks Ali Eksim 2012-03-14 This book will provide a comprehensive technical guide covering fundamentals, recent advances and open issues in wireless communications and networks to the readers. The objective of the book is to serve as a valuable reference for students, educators, scientists, faculty members, researchers, engineers and research strategists in these rapidly evolving fields and to encourage them to actively explore these broad, exciting and rapidly evolving research areas.

Position, Navigation, and Timing Technologies in the 21st Century Y. Jade Morton 2020-12-17 Covers the latest developments in PNT technologies, including integrated satellite navigation, sensor systems, and civil applications Featuring sixty-four chapters that are divided into six parts, this two-volume work provides comprehensive coverage of the state-of-the-art in satellite-based position, navigation, and timing (PNT) technologies and civilian applications. It also examines alternative navigation technologies based on other signals-of-opportunity and sensors and offers a comprehensive treatment on integrated PNT systems for consumer and commercial applications. Volume 1 of *Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor Systems, and Civil Applications* contains three parts and focuses on the satellite navigation systems, technologies, and engineering and scientific applications. It starts with a historical perspective of GPS development and other related PNT development. Current global and regional navigation satellite systems (GNSS and RNSS), their inter-operability, signal quality monitoring, satellite orbit and time synchronization, and ground- and satellite-based augmentation systems are examined. Recent progresses in satellite navigation receiver technologies and challenges for operations in multipath-rich urban environment, in handling spoofing and interference, and in ensuring PNT integrity are addressed. A section on satellite navigation for engineering and scientific applications finishes off the volume. Volume 2 of *Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor Systems, and Civil Applications* consists of three parts and addresses PNT using alternative signals and sensors and integrated PNT technologies for consumer and commercial applications. It looks at PNT using various radio signals-of-opportunity, atomic clock, optical, laser, magnetic field, celestial, MEMS and inertial sensors, as well as the concept of navigation from Low-Earth Orbiting (LEO) satellites. GNSS-INS integration, neuroscience of navigation, and animal navigation are also covered. The volume

finishes off with a collection of work on contemporary PNT applications such as survey and mobile mapping, precision agriculture, wearable systems, automated driving, train control, commercial unmanned aircraft systems, aviation, and navigation in the unique Arctic environment. In addition, this text: Serves as a complete reference and handbook for professionals and students interested in the broad range of PNT subjects Includes chapters that focus on the latest developments in GNSS and other navigation sensors, techniques, and applications Illustrates interconnecting relationships between various types of technologies in order to assure more protected, tough, and accurate PNT Position, Navigation, and Timing Technologies in the 21st Century: Integrated Satellite Navigation, Sensor Systems, and Civil Applications will appeal to all industry professionals, researchers, and academics involved with the science, engineering, and applications of position, navigation, and timing technologies. pnt21book.com

Flying Ad Hoc Networks Jingjing Wang 2022-02-10 Relying on unmanned autonomous flight control programs, unmanned aerial vehicles (UAVs) equipped with radio communication devices have been actively developed around the world. Given their low cost, flexible maneuvering and unmanned operation, UAVs have been widely used in both civilian operations and military missions, including environmental monitoring, emergency communications, express distribution, even military surveillance and attacks, for example. Given that a range of standards and protocols used in terrestrial wireless networks are not applicable to UAV networks, and that some practical constraints such as battery power and no-fly zone hinder the maneuverability capability of a single UAV, we need to explore advanced communication and networking theories and methods for the sake of supporting future ultra-reliable and low-latency applications. Typically, the full potential of UAV network's functionalities can be tapped with the aid of the cooperation of multiple drones relying on their ad hoc networking, in-network communications and coordinated control. Furthermore, some swarm intelligence models and algorithms conceived for dynamic negotiation, path programming, formation flight and task assignment of multiple cooperative drones are also beneficial in terms of extending UAV's functionalities and coverage, as well as of increasing their efficiency. We call the networking and cooperation of multiple drones as the terminology 'flying ad hoc network (FANET)', and there indeed are numerous new challenges to be overcome before the idespread of so-called heterogeneous FANETs. In this book, we examine a range of technical issues in FANETs, from physical-layer channel modeling to MAC-layer resource allocation, while also introducing readers to UAV aided mobile edge computing techniques.