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JAYLA BURGESS

Foundations of MIMO Communication
John Wiley & Sons
* A learner-friendly, practical and example driven book, Wireless Communication Systems in Matlab gives you a solid background in building simulation models for wireless systems in Matlab. This book, an essential guide for understanding the basic implementation aspects of a wireless system, shows how to simulate and model such a system from scratch. The implemented simulation models shown in this book, provide an opportunity for an engineer to understand the basic implementation aspects of modeling various building blocks of a wireless communication system. It presents the following key topics with the required theoretical background, along with the implementation details in the form of Matlab scripts. * Random variables for simulating probabilistic systems and applications like Jakes filter design and colored noise generation. * Models for Shannon's channel capacity, unconstrained awgn channel, binary symmetric channel (BSC), binary erasure channel (BEC), constellation constrained capacities and ergodic capacity over fading channel. The theory of linear block codes, decoding techniques using soft-decisions and hard-decisions, and their performance simulations. * Monte Carlo simulation for ascertaining performance of digital modulation techniques in AWGN and fading channels - Eb/N0 Vs BER curves. Pulse shaping techniques, matched filtering and partial response signaling, Design and implementation of linear equalizers - zero forcing and MMSE equalizers, using them in a communication link and modulation systems with receiver impairments. * Large-scale propagation models like Friis free space model, log distance model, two ray ground reflection

model, single knife-edge diffraction model, Hata Okumura model. * Essentials of small-scale propagation models for wireless channels, such as, power delay profile, Doppler power spectrum, Rayleigh and Rice processes. Modeling flat fading and frequency selective channels. * Diversity techniques for multiple antenna systems: Alamouti space-time coding, maximum ratio combining, equal gain combining and selection combining. * Simulation models for direct sequence spread spectrum, frequency hopping spread spectrum and OFDM.

Pattern Recognition and Computational Intelligence Techniques Using Matlab CRC Press

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

Adaptive Filters Artech House

Orthogonal Frequency Division Multiplexing (OFDM) has been the waveform of choice for most wireless communications systems in the past 25 years. This book addresses the “what comes next? question by presenting the recently proposed waveform known as Orthogonal Time-Frequency-Space (OTFS), which offers a better alternative for high-mobility environments. The OTFS waveform is based on the idea that the mobile wireless channels can be effectively modelled in the delay-Doppler domain. This domain provides a sparse representation closely resembling the physical geometry of the wireless channel. The key physical parameters such as relative velocity and distance of the reflectors with respect to the receiver can be considered roughly invariant in the duration of a frame up to a few milliseconds. This enables the information symbols encoded in the delay-Doppler domain to experience a flat fading channel even when they are affected by multiple Doppler shifts present in high-mobility environments. Delay-Doppler Communications: Principles and Applications covers the fundamental concepts and the underlying principles of delay-Doppler communications. Readers familiar with OFDM will be able to quickly understand the key differences in delay-

Doppler domain waveforms that can overcome some of the challenges of high-mobility communications. For the broader readership with a basic knowledge of wireless communications principles, the book provides sufficient background to be self-contained. The book provides a general overview of future research directions and discusses a range of applications of delay-Doppler domain signal processing. This is the first book on delay-Doppler communications It is written by three of the leading authorities in the field It includes a wide range of applications With this book, the reader will be able to: Recognize the challenges of high-mobility channels affected by both multipath and multiple Doppler shifts in physical layer waveform design and performance Understand the limitations of current multicarrier techniques such as OFDM in high-mobility channels Recognize the mathematical and physical relations between the different domains for representing channels and waveforms: time-frequency, time-delay, delay-Doppler Understand the operation of the key blocks of a delay-Doppler modulator and demodulator both analytically and by hands-on MATLAB examples Master the special features and advantages of OTFS with regard to detection, channel estimation, MIMO, and multiuser MIMO Realize the importance of delay-Doppler communications for current and future applications, e.g., 6G and beyond

Visible Light Communication John Wiley & Sons

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

Digital Signal Processing for Wireless Communication using Matlab Cambridge University Press

This book discusses the latest channel coding techniques, MIMO systems, and 5G channel coding evolution. It provides a comprehensive overview of channel coding, covering modern techniques such as turbo codes, low-density parity-check (LDPC) codes, space–time coding, polar codes, LT codes, and Raptor codes as well as the traditional codes such as cyclic codes, BCH, RS codes, and convolutional codes. It also explores MIMO communications, which is an effective method for high-speed or high-reliability wireless communications. It also examines the evolution of 5G channel coding techniques. Each of the 13 chapters features numerous illustrative examples for easy understanding of the coding techniques, and MATLAB-based programs are integrated in the text to enhance readers' grasp of the underlying theories. Further, PC-based MATLAB m-files for illustrative examples are included for students and researchers involved in advanced and current concepts of coding theory.

Advanced Intelligent Systems for Sustainable Development (AI2SD'2019) John Wiley & Sons

Based on cutting-edge research projects in the field, this book (part of a comprehensive 4-volume series) provides the latest details and covers the most impactful aspects of mobile, wireless, and broadband communications development. These books present key systems and enabling technologies in a clear and accessible manner, offering you a detailed

roadmap the future evolution of next generation communications. Other volumes cover Networks, Services and Applications; Reconfigurability; and Ad Hoc Networks.

Baseband Receiver Design for Wireless MIMO-OFDM Communications CRC Press

The First International ICST Conference on Communications Infrastructure, Systems and Applications in Europe (EuropeComm 2009) was held August 11–13, 2009, in London. EuropeComm 2009 brought together decision makers from the EU comm- sion, top researchers and industry executives to discuss the directions of communi- tions research and development in Europe. The event also attracted academia and industry representatives, as well as government officials to discuss the current dev- opments and future trends in technology, applications and services in the communi- tions field. Organizing this conference was motivated by the fact that the development and - ployment of future services will require a common global-scale infrastructure, and therefore it is important that designers and stakeholders from all the systems stacks come together to discuss these developments. Rapidly decreasing costs of compu- tional power, storage capacity, and communication bandwidth have led to the dev- opment of a multitude of applications carrying an increasingly huge amount of traffic on the global networking infrastructure. What we have seen is an evolution: an inf- structure looking for networked applications has evolved into an infrastructure str- gling to meet the social, technological and business challenges posed by the plethora of bandwidth-hungry emerging applications.

mmWave Massive MIMO Pearson Education

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.

OFDM Baseband Receiver Design for Wireless Communications Andreas Schwarzinger

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.

MIMO Wireless Communications over Generalized Fading Channels Springer Nature

Detailing the advantages and limitations of multi-carrier communication, this book proposes possible solutions for these limitations. Multi-Carrier Communication Systems with Examples in MATLAB: A New Perspective addresses the two primary drawbacks of orthogonal frequency division multiplexing (OFDM) communication systems: the high sensitivity to c

Optimal Resource Allocation in Coordinated Multi-Cell Systems Artech House

An introduction to technical details related to the PhysicalLayer of the LTE standard with MATLAB® The LTE (Long Term Evolution) and LTE-Advanced are among thelatest mobile communications standards, designed to realize thedream of a truly global, fast, all-IP-based, secure broadbandmobile access technology. This book examines the Physical Layer (PHY) of the LTE standardsby incorporating three conceptual elements: an overview of thetheory behind key enabling technologies; a concise discussionregarding standard specifications; and the MATLAB® algorithmsneeded to simulate the standard. The use of MATLAB®, a widely used technical computinglanguage, is one of the distinguishing features of this book.Through a series of MATLAB® programs, the author explores eachof the enabling technologies, pedagogically synthesizes an LTE PHYsystem model, and evaluates system performance at each stage.Following this step-by-step process, readers will achieve deeperunderstanding of LTE concepts and specifications throughsimulations. Key Features: • Accessible, intuitive, and progressive; one of the fewbooks to focus primarily on the modeling, simulation, andimplementation of the LTE PHY standard • Includes case studies and testbenches in MATLAB®,which build knowledge gradually and incrementally until afunctional specification for the LTE PHY is attained • Accompanying Web site includes all MATLAB® programs,together with PowerPoint slides and other illustrative examples Dr Houman Zarrinkoub has served as a development manager andnow as a senior product manager with MathWorks, based inMassachusetts, USA. Within his 12 years at MathWorks, he has beenresponsible for multiple signal processing and communicationssoftware tools. Prior to MathWorks, he was a research scientist

inthe Wireless Group at Nortel Networks, where he contributed tomultiple standardization projects for 3G mobile technologies. Hehas been awarded multiple patents on topics related to computersimulations. He holds a BSc degree in Electrical Engineering fromMcGill University and MSc and PhD degrees in Telecommunicationsfrom the Institut Nationale de la Recherche Scientifique, inCanada.
ahref="http://www.wiley.com/go/zarrinkoub"www.wiley.com/go/zarrinkoub/a
Applied Numerical Methods Using MATLAB Springer Nature
MIMO systems have been known to better the quality of service for wireless communication systems. This book discusses emerging techniques in MIMO systems to reduce complexities and keep benefits unaffected at the same time. It discusses about benefits and shortcomings of various MIMO technologies like spatial multiplexing, space time coding, spatial modulation, transmit antenna selection and various power allocation schemes to optimize the performance. Crux of the book is focus on MIMO communication over generalized fading channels as they can model the propagation of signals in a non-homogeneous environment. Relevant MATLAB codes are also included in the appendices. Book is aimed at graduate students and researchers in electronics and wireless engineering specifically interested in electromagnetic theory, antennas and propagation, future wireless systems, signal processing.
Smart Antennas, Electromagnetic Interference and Microwave Antennas for Wireless Communications Cambridge University Press
This second edition of Adaptive Filters: Theory andApplications has been updated throughout to reflect the latestdevelopments in this field; notably an increased coverage given tothe practical applications of the theory to illustrate the muchbroader range of adaptive filters applications developed in recentyears. The book offers an easy to understand approach to the theoryand application of adaptive filters by clearly illustrating how thetheory explained in the early chapters of the book is modified forthe various applications discussed in detail in later chapters.This integrated approach makes the book a valuable resource forgraduate students; and the inclusion of more advanced applicationsincluding antenna arrays and wireless communications makes it asuitable technical reference for engineers, practitioners andresearchers. Key features: • Offers a thorough treatment of the theory of adaptivesignal processing; incorporating new material on transform domain,frequency domain, subband adaptive filters, acoustic echocancellation and active noise control. • Provides an in-depth study of applications which nowincludes extensive coverage of OFDM, MIMO and smart antennas. • Contains exercises and computer simulation problems atthe end of each chapter. • Includes a new companion website hosting MATLAB®simulation programs which complement the theoretical analyses,enabling the reader to gain an in-depth understanding of thebehaviours and properties of the various adaptive algorithms.
Practical Guide to MIMO Radio Channel John Wiley & Sons
This book provides an excellent reference to the MIMO radio channel In this book, the

authors introduce the concept of the Multiple Input Multiple Output (MIMO) radio channel, which is an intelligent communication method based upon using multiple antennas. Moreover, the authors provide a summary of the current channel modeling approaches used by industry, academia, and standardisation bodies. Furthermore, the book is structured to allow the reader to easily progress through the chapters in order to gain an understanding of the fundamental and mathematical principles behind MIMO. It also provides examples (i.e. Kroenecker model, Weicheselberger model, geometric and deterministic models, and ray tracing), system scenarios, trade-offs, and visual explanations. The authors explain and demonstrate the use and application of these models at system level. Key Features: Provides a summary of the current channel modeling approaches used by industry, academia and standardisation bodies Contains experimental and measurement based results Provides a comprehensive down to earth approach with concise and visual explanations of MIMO Radio Channel Covers a variety of system scenarios and explains the trade-offs involved in each Accompanying website containing MATLAB code and solutions to related problems http://www.tim.brown76.name/MIMObook) Practical Guide to the MIMO Radio Channel with MATLAB examples is an invaluable reference for R&D engineers and professionals in industry requiring familiarisation with the concept, and engineers entering the field or working in related fields seeking an introduction to the topic. Postgraduate and graduate students will also find this book of interest.

OFDM for Optical Communications Artech House

SC-FDMA for Mobile Communications examines Single-Carrier Frequency Division Multiple Access (SC-FDMA). Explaining this rapidly evolving system for mobile communications, it describes its advantages and limitations and outlines possible solutions for addressing its current limitations. The book explores the emerging trend of cooperative communication with SC-FDMA and how it can improve the physical layer security. It considers the design of distributed coding schemes and protocols for wireless relay networks where users cooperate to send their data to the destination. Supplying you with the required foundation in cooperative communication and cooperative diversity, it presents an improved Discrete Cosine Transform (DCT)-based SC-FDMA system. It introduces a distributed space–time coding scheme and evaluates its performance and studies distributed SFC for broadband relay channels. Presents relay selection schemes for improving the physical layer Introduces a new transceiver scheme for the SC-FDMA system Describes space–time/frequency coding schemes for SC-FDMA Includes MATLAB® codes for all simulation experiments The book investigates Carrier Frequency Offsets (CFO) for the Single-Input Single-Output (SISO) SC-FDMA system, and Multiple-Input Multiple-Output (MIMO) SC-FDMA system simulation software. Covering the design of cooperative diversity schemes for the SC-FDMA system in the uplink direction, it also introduces and studies a new transceiver scheme for the SC-FDMA system.

Weightlifting Springer Nature

Coding for MIMO Communication Systems is a comprehensive introduction and

overview to the various emerging coding techniques developed for MIMO communication systems. The basics of wireless communications and fundamental issues of MIMO channel capacity are introduced and the space-time block and trellis coding techniques are covered in detail. Other signaling schemes for MIMO channels are also considered, including spatial multiplexing, concatenated coding and iterative decoding for MIMO systems, and space-time coding for non-coherent MIMO channels. Practical issues including channel correlation, channel estimation and antenna selection are also explored, with problems at the end of each chapter to clarify many important topics. A comprehensive book on coding for MIMO techniques covering main strategies Theories and practical issues on MIMO communications are examined in detail Easy to follow and accessible for both beginners and experienced practitioners in the field References at the end of each chapter for further reading Can be used with ease as a research book, or a textbook on a graduate or advanced undergraduate level course This book is aimed at advanced undergraduate and postgraduate students, researchers and practitioners in industry, as well as individuals working for government, military, science and technology institutions who would like to learn more about coding for MIMO communication systems.

Problem-Based Learning in Communication Systems Using MATLAB and Simulink Academic Press

Designed to help teach and understand communication systems using a classroom-tested, active learning approach. Discusses communication concepts and algorithms, which are explained using simulation projects, accompanied by MATLAB and Simulink Provides step-by-step code exercises and instructions to implement execution sequences Includes a companion website that has MATLAB and Simulink model samples and templates (password: matlab)

Multi-Carrier Communication Systems with Examples in MATLAB John Wiley & Sons

This proceedings book presents extended versions of papers on advanced intelligent systems for networks and system selected from the second edition of the International Conference on Advanced Intelligent Systems for Sustainable Development (AI2SD'2019), which was held on 8–11 July 2019 in Marrakech, Morocco. The book explores a number of aspects of networks and systems design issues, and focuses on the latest research developments in a number of areas, including various aspects of modern networking such as smart networked systems, network protocols and performance, security and privacy, mobile and wireless systems, Internet of things, artificial intelligence and expert systems, and cloud computing, as well as enabling technologies. The book also examines the area of intelligence, comprehensively examining a range of important topics like intelligent collaborative systems for work and learning, security, organization, management and autonomic computing for intelligent networking and collaborative systems, wireless and sensor systems for intelligent networking and collaborative systems, data mining and knowledge management for intelligent networking and collaborative systems, data for Internet of things, and cloud computing. Each chapter presents the state of the art

in a specific topic as well as the results of research and laboratory experiments, and successful applications. The book is intended for academic and industry researchers and telecommunication network engineers wanting to gain insights into these areas, particularly in the context of Industry 4.0.

Channel Coding Techniques for Wireless Communications CRC Press
The second edition of Digital Signal Processing in Modern Communication Systems (www.signal-processing.net) takes you on a journey that starts with basic DSP principles and ends with a treatment of modern wireless modems such as single-tone and OFDM transceivers which are found in GSM, WLAN, LTE and 5G technologies. Throughout this journey, we will cover signal processing topics that are applicable not just to the field of communications but to many engineering disciplines. This text steps outside the often dry mathematical presentation of more traditional DSP books and provides a more intuitive approach to this fascinating topic. Some of this book's uniqueness can be summarized as follows: - An intuitive approach to the topic of digital signal processing. - Working in-book MatLab examples supporting all important concepts. - A large scope covering basic concepts (correlation, convolution, DFT, FIR filters ...) as well as advanced topics (optimization, adaptive signal processing, equalization, OFDM, MIMO ...). - MatLab modeling of analog/RF effects (multipath channel, thermal noise, phase noise, IQ imbalances, DC and frequency offsets) that must be addressed and solved in modern modem design. - Real world topics that go beyond the ordinary communication textbooks such as signal synchronization, modem rate management, and fixed-point effects. All in all, this book is a must-have for students and practicing engineers who want to build upon the principles of Digital Signal Processing, enrich their understanding with advanced topics, and then apply that knowledge to the design of modern wireless modems.

Digital Signal Processing in Modern Communication Systems (Edition 2) Academic Press
With the growing complexity of personal mobile communication systems demanding higher data-rates and high levels of integration using low-cost CMOS technology, overall system performance has become more sensitive to RF analog front-end impairments. Designing integrated transceivers requires a thorough understanding of the whole transceiver chain including RF analog front-end and digital baseband. Communication system engineers have to include RF analog imperfections in their simulation benches in order to study and quantify their impact on the system performance. Here the author explores key RF analog impairments in a transceiver and demonstrates how to model their impact from a communication system design view-point. He discusses the design aspects of the front end of transceivers (both receivers and transmitters) and provides the reader with a way to optimize a complex mixed-signal platform by taking into account the characteristics of the RF/analog front-end. Key features of this book include: Practical examples illustrated by system simulation results based on WiFi and mobile WiMAX OFDM transceivers An overview of the digital estimation and compensation of the RF analog impairments such as power

amplifier distortion, quadrature imbalance, and carrier and sampling frequency offsets An exposition of the challenges involved in the design of both RF analog circuits and DSP communication circuits in deep submicron CMOS technology MATLAB® codes for RF analog impairments models hosted on the companion website Uniquely the book bridges the gap between RFIC design specification needs and communication systems simulation, offering readers RF analog impairments modeling knowledge and a comprehensive approach to unifying theory and practice in system modelling. It is of great value to communication systems and DSP engineers and graduate students who design communication processing engines, RF/analog systems and IC design engineers involved in the design of communication platforms.