

Principles Of Communication Systems Simulation With Wireless Applications

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Principles of Communication Systems Simulation with Wireless Applications-William H. Tranter 2004 This volume presents an overview of computer-based simulation models and methodologies for communication systems. Topics covered include probability, random, process, and estimation theory and roles in the design of computer-based simulations.

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Understanding Communications Systems Principles — A Tutorial Approach-Héctor J. De Los Santos 2021-06-07 Wireless communications and sensing systems are nowadays ubiquitous: cell phones and automotive radars typifying two of the most familiar examples. This book introduces the field by addressing its fundamental principles, proceeding from its very beginnings up to today's emerging technologies related to the fifth-generation wireless systems (5G), Multi-Input Multiple Output (MIMO) connectivity, and Aerospace/Electronic Warfare Radar. The tone is tutorial. Problems are included at the end of each chapter to facilitate the understanding and assimilation of the material to electrical engineering undergraduate/graduate students and beginning and non-specialist professionals. Free temporary access to Keysight's SystemVue system simulation is provided to further enhance reader learning through hands-on tutorial exercises. Chapter 1 introduces wireless communications and sensing and in particular how curiosity-driven scientific research led to the foundation of the field. Chapter 2 presents a brief introduction to the building blocks that make up wireless systems. Chapter 3 focuses on developing an understanding of the performance parameters that characterize a wireless system. Chapter 4 deals with circuit topologies for modulation and detection. In Chapter 5 we cover the fundamental transmitter and receiver systems architectures that enable the transmission of information at precise frequencies and their reception from among a rather large multitude of other signals present in space. Chapter 6 introduces 5G, its motivation, and its development and adoption challenges for providing unprecedented levels of highest speed wireless connectivity. Chapter 7 takes on the topic of MIMO, its justification and its various architectures. Chapter 8 addresses the topic of aerospace/electronic warfare radar and finally Chapter 9 presents three Tutorials utilizing the SystemVue simulation tool.

Principles of Communication Systems Simulation With Wireless Applications

Simulation of Communication Systems-Michel C. Jeruchim 2006-04-11 Since the first edition of this book was published seven years ago, the field of modeling and simulation of communication systems has grown and matured in many ways, and the use of simulation as a day-to-day tool is now even more common practice. With the current interest in digital mobile communications, a primary area of application of modeling and simulation is now in wireless systems of a different flavor from the `traditional' ones. This second edition represents a substantial revision of the first, partly to accommodate the new applications that have arisen. New chapters include material on modeling and simulation of nonlinear systems, with a complementary section on related measurement techniques, channel modeling and three new case studies; a consolidated set of problems is provided at the end of the book.

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Communication Systems Principles Using MATLAB-John W. Leis 2018-07-31 Discover the basic telecommunications systems principles in an accessible learn-by-doing format Communication Systems Principles Using MATLAB covers a variety of systems principles in telecommunications in an accessible format without the need to master a large body of theory. The text puts the focus on topics such as radio and wireless modulation, reception and transmission, wired networks and fiber optic communications. The book also explores packet networks and TCP/IP as well as digital source and channel coding, and the fundamentals of data encryption. Since MATLAB® is widely used by telecommunications engineers, it was chosen as the vehicle to demonstrate many of the basic ideas, with code examples presented in every chapter. The text addresses digital communications with coverage of packet-switched networks. Many fundamental concepts such as routing via shortest-path are introduced with simple and concrete examples. The treatment of advanced telecommunications topics extends to OFDM for wireless modulation, and public-key exchange algorithms for data encryption. Throughout the book, the author puts the emphasis on understanding rather than memorization. The text also: Includes many useful take-home skills that can be honed while studying each aspect of telecommunications Offers a coding and experimentation approach with many real-world examples provided Gives information on the underlying theory in order to better understand conceptual developments Suggests a valuable learn-by-doing approach to the topic Written for students of telecommunications engineering, Communication Systems Principles Using MATLAB® is the hands-on resource for mastering the basic concepts of telecommunications in a learn-by-doing format.

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Analog Integrated Circuits for Communication-Donald O. Pederson 2007-10-04 Analog Integrated Circuits for Communication: Principles, Simulation and Design, Second Edition covers the analysis and design of nonlinear analog integrated circuits that form the basis of present-day communication systems. Both bipolar and MOS transistor circuits are analyzed and several numerical examples are used to illustrate the analysis and design techniques developed in this book. Especially unique to this work is the tight coupling between the first-order circuit analysis and circuit simulation results. Extensive use has been made of the public domain circuit simulator Spice, to verify the results of first-order analyses, and for detailed simulations with complex device models. Highlights of the new edition include: A new introductory chapter that provides a brief review of communication systems, transistor models, and distortion generation and simulation. Addition of new material on MOSFET mixers, compression and intercept points, matching networks. Revisions of text and explanations where necessary to reflect the new organization of the book Spice input files for all the circuit examples that are available to the reader from a website. Problem sets at the end of each chapter to reinforce and apply the subject matter. An instructors solutions manual is available on the book's webpage at springer.com. Analog Integrated Circuits for Communication: Principles, Simulation and Design, Second Edition is for readers who have completed an introductory course in analog circuits and are familiar with basic analysis techniques as well as with the operating principles of semiconductor devices. This book also serves as a useful reference for practicing engineers.

Principles of Communication Systems Simulation With Wireless Applications

Nonlinear Distortion in Wireless Systems-Khaled M. Gharaibeh 2011-12-30 This book covers the principles of modeling and simulation of nonlinear distortion in wireless communication systems with MATLAB simulations and techniques In this book, the author describes the principles of modeling and simulation of nonlinear distortion in single and multichannel wireless communication systems using both deterministic and stochastic signals. Models and simulation methods of nonlinear amplifiers explain in detail how to analyze and evaluate the performance of data communication links under nonlinear amplification. The book addresses the analysis of nonlinear systems with stochastic inputs and establishes the performance metrics of communication systems with regard to nonlinearity. In addition, the author also discusses the problem of how to embed models of distortion in system-level simulators such as MATLAB and MATLAB Simulink and provides practical techniques that professionals can use on their own projects. Finally, the book explores simulation and programming issues and provides a comprehensive reference of simulation tools for nonlinearity in wireless communication systems. Key Features: Covers the theory, models and simulation tools needed for understanding nonlinearity and nonlinear distortion in wireless systems Presents simulation and modeling techniques for nonlinear distortion in wireless channels using MATLAB Uses random process theory to develop simulation tools for predicting nonlinear system performance with real-world wireless communication signals Focuses on simulation examples of real-world communication systems under nonlinearity Includes an accompanying website containing MATLAB code This book will be an invaluable reference for researchers, RF engineers, and communication system engineers working in the field. Graduate students and professors undertaking related courses will also find the book of interest.

Principles of Communication Systems Simulation With Wireless Applications

Integrated Models for Information Communication Systems and Networks: Design and Development-Atayero, Aderemi Aaron Anthony 2013-06-30 With current advancements in the modeling and simulation of systems and networks, researchers and developers are better able to determine the probable state of current systems and envision the state of future systems during the design stage. The uses and accuracies of these models are essential to every aspect of communication systems. Integrated Models for Information Communication Systems and Networks: Design and Development explores essential information and current research findings on information communication systems and networks. This reference source aims to assist professionals in the desire to enhance their knowledge of modeling at systems level with the aid of modern software packages.

Principles of Communication Systems Simulation With Wireless Applications

Principles of Communications-Rodger E. Ziemer 2002 Sections on important areas such as spread spectrum, cellular communications, and orthogonal frequency-division multiplexing are provided. * Computational examples are included, illustrating how to use the computer as a simulation tool, thereby allowing waveforms, spectra, and performance curves to be generated. * Overviews of the necessary background in signal, system, probability, and random process theory required for the analog and digital communications topics covered in the book.

Principles of Communication Systems Simulation With Wireless Applications

Chaos-Based Digital Communication Systems-Francis C.M. Lau 2013-03-09 One of the first books in this area, this text focuses on important aspects of the system operation, analysis and performance evaluation of selected chaos-based digital communications systems - a hot topic in communications and signal processing.

Principles of Communication Systems Simulation With Wireless Applications

RF Analog Impairments Modeling for Communication Systems Simulation-Lydi Smaini 2012-09-04 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.

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Simulation Techniques-Floyd M. Gardner 1996-10-10 The design of communication systems has grown too complicated for the traditional design tools--mathematical analysis and laboratory breadboards. Enter the computer simulation, a powerful and versatile tool that is becoming essential for anyone who designs signal transmission or storage systems. This volume explains in detail how to use simulation programs as a software breadboard to analyze and evaluate the performance of data communications links. It describes the engineering principles of signal transmission and its simulation, explores programming issues, and provides a comprehensive reference for models of signal processes. The book clearly demonstrates how simulation techniques can be used to: * Create valid models of signal processes * Provide exibility through the use of modules * Simulate various elements of communications systems, from filters and modulators to test instruments * Explore alternative models for a given system * Circumvent the mathematical intractability of modern transmission links * Plan and construct a computer model in a matter of hours or days, versus the weeks or months needed for laboratory breadboards * Make parameter changes in minutes once a link has been modeled * Provide engineers and students with complete training on the elements of simulation A must have for designers, practicing engineers, and graduate students, this volume presents real-world techniques that can be used with the authors' ST?DT program (a companion work also published by Wiley), or independently with other commercially available simulators.

Principles of Communication Systems Simulation With Wireless Applications

Introduction to Communication Systems-Upamanyu Madhow 2014-11-24 An accessible undergraduate textbook introducing key fundamental principles behind modern communication systems, supported by exercises, software problems and lab exercises.

Principles of Communication Systems Simulation With Wireless Applications

Principles of Mobile Communication-Gordon L. Stüber 2013-03-09 Principles of Mobile Communication provides an authoritative treatment of the fundamentals of mobile communications, one of the fastest growing areas of the modern telecommunications industry. The book stresses the fundamentals of mobile communications engineering that are important for the design of any mobile system. Less emphasis is placed on the description of existing and proposed wireless standards. This focus on fundamental issues should be of benefit not only to students taking formal instruction but also to practising engineers who are likely to already have a detailed familiarity with the standards and are seeking to deepen their knowledge of this important field. The book stresses mathematical modeling and analysis, rather than providing a qualitative overview. It has been specifically developed as a textbook for graduate level instruction and a reference book for practising engineers and those seeking to pursue research in the area. The book contains sufficient background material for the novice, yet enough advanced material for a sequence of graduate level courses. Principles of Mobile Communication treats a variety of contemporary issues, many of which have been treated before only in the journals. Some material in the book has never appeared before in the literature. The book provides an up-to-date treatment of the subject area at a level of detail that is not available in other books. Also, the book is unique in that the whole range of topics covered is not presently available in any other book. Throughout the book, detailed derivations are provided and extensive references to the literature are made. This is of value to the reader wishing to gain detailed knowledge of a particular topic.

Principles of Communication Systems Simulation With Wireless Applications

Fundamentals of Wireless Communication-David Tse 2005-05-26 This textbook takes a unified view of the fundamentals of wireless communication and explains cutting-edge concepts in a simple and intuitive way. An abundant supply of exercises make it ideal for graduate courses in electrical and computer engineering and it will also be of great interest to practising engineers.

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Emerging Technologies for Health and Medicine-Dac-Nhuong Le 2018-10-02 With the current advances in technology innovation, the field of medicine and healthcare is rapidly expanding and, as a result, many different areas of human health diagnostics, treatment and care are emerging. Wireless technology is getting faster and 5G mobile technology allows the Internet of Medical Things (IoMT) to greatly improve patient care and more effectively prevent illness from developing. This book provides an overview and review of the current and anticipated changes in medicine and healthcare due to new technologies and faster communication between users and devices. This groundbreaking book presents state-of-the-art chapters on many subjects including: A review of the implications of VR and AR healthcare applications A review of current augmenting dental care An overview of typical human-computer interaction (HCI) that can help inform the development of user interface designs and novel ways to evaluate human behavior to responses in virtual reality (VR) and other new technologies A review of telemedicine technologies Building empathy in young children using augmented reality AI technologies for mobile health of stroke monitoring & rehabilitation robotics control Mobile doctor brain AI App An artificial intelligence mobile cloud computing tool Development of a robotic teaching aid for disabled children Training system design of lower limb rehabilitation robot based on virtual reality

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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.

Optical Wireless Communications-Z. Ghassemlooy 2019-04-30 The 2nd Edition of Optical Wireless Communications: System and Channel Modelling with MATLAB® with additional new materials, is a self-contained volume that provides a concise and comprehensive coverage of the theory and technology of optical wireless communication systems (OWC). The delivery method makes the book appropriate for students studying at undergraduate and graduate levels as well as researchers and professional engineers working in the field of OWC. The book gives a detailed description of OWC, focusing mainly on the infrared and visible bands, for indoor and outdoor applications. A major attraction of the book is the inclusion of Matlab codes and simulations results as well as experimental test-beds for free space optics and visible light communication systems. This valuable resource will aid the readers in understanding the concept, carrying out extensive analysis, simulations, implementation and evaluation of OWC links. This 2nd edition is structured into nine compact chapters that cover the main aspects of OWC systems: History, current state of the art and challenges Fundamental principles Optical source and detector and noise sources Modulation, equalization, diversity techniques Channel models and system performance analysis Visible light communications Terrestrial free space optics communications Relay-based free space optics communications Matlab codes. A number of Matlab based simulation codes are included in this 2nd edition to assist the readers in mastering the subject and most importantly to encourage them to write their own simulation codes and enhance their knowledge.

Digital Transmission-Dayan Adionel Guimaraes 2010-01-18 Digital Transmission – A Simulation-Aided Introduction with VisSim/Comm is a book in which basic principles of digital communication, mainly pertaining to the physical layer, are emphasized. Nevertheless, these principles can serve as the fundamentals that will help the reader to understand more advanced topics and the associated technology. In this book, each topic is addressed in two different and complementary ways: theoretically and by simulation. The theoretical approach encompasses common subjects covering principles of digital transmission, like notions of probability and stochastic processes, signals and systems, baseband and passband signaling, signal-space representation, spread spectrum, multi-carrier and ultra wideband transmission, carrier and symbol-timing recovery, information theory and error-correcting codes. The simulation approach revisits the same subjects, focusing on the capabilities of the communication system simulation software VisSim/Comm on helping the reader to fulfill the gap between the theory and its practical meaning. The presentation of the theory is made easier with the help of 357 illustrations. A total of 101 simulation files supplied in the accompanying CD support the simulation-oriented approach. A full evaluation version and a viewer-only version of VisSim/Comm are also supplied in the CD.

Digital Communications with Emphasis on Data Modems-Richard W. Middlestead 2017-03-07 This book uses a practical approach in the application of theoretical concepts to digital communications in the design of software defined radio modems. This book discusses the design, implementation and performance verification of waveforms and algorithms appropriate for digital data modulation and demodulation in modern communication systems. Using a building-block approach, the author provides an introductory to the advanced understanding of acquisition and data detection using source and executable simulation code to validate the communication system performance with respect to theory and design specifications. The author focuses on theoretical analysis, algorithm design, firmware and software designs and subsystem and system testing. This book treats system designs with a variety of channel characteristics from very low to optical frequencies. This book offers system analysis and subsystem implementation options for acquisition and data detection appropriate to the channel conditions and system specifications, and provides test methods for demonstrating system performance. This book also: Outlines fundamental system requirements and related analysis that must be established prior to a detailed subsystem design Includes many examples that highlight various analytical solutions and case studies that characterize various system performance measures Discusses various aspects of atmospheric propagation using the spherical 4/3 effective earth radius model Examines Ionospheric propagation and uses the Rayleigh fading channel to evaluate link performance using several robust waveform modulations Contains end-of-chapter problems, allowing the reader to further engage with the text Digital Communications with Emphasis on Data Modems is a great resource for communication-system and digital signal processing engineers and students looking for in-depth theory as well as practical implementations.

Analog Integrated Circuits for Communication-Donald O. Pederson 2013-04-17 This book deals with the analysis and design of analog integrated circuits that form the basis of present-day communication systems. The material is intended to be a textbook for class use but should also be a valuable source of information for a practicing engineer. Both bipolar and MOS transistor circuits are analyzed and many numerical examples are used to illustrate the analysis and design techniques developed in this book. A set of problems is presented at the end of the book which covers the subject matter of the whole book. The book has originated out of a senior-level course on nonlinear, analog integrated circuits at the University of California at Berkeley. The material contained in this book has been taught by the first author for several years and the book has been class tested for six semesters. This along with feedback from the students is reflected in the organization and writing of the text. We expect that the students have had an introductory course in analog circuits so that they are familiar with some of the basic analysis techniques and also with the operating principles of the various semiconductor devices. Several important, basic circuits and concepts are reviewed as the subject matter is developed.

Analog Integrated Circuits for Communication-Donald O. Pederson 2014-01-15

Optical Fiber Communication Systems with MATLAB® and Simulink® Models-Le Nguyen Binh 2014-12-01 Carefully structured to instill practical knowledge of fundamental issues, Optical Fiber Communication Systems with MATLAB® and Simulink® Models describes the modeling of optically amplified fiber communications systems using MATLAB® and Simulink®. This lecture-based book focuses on concepts and interpretation, mathematical procedures, and engineering applications, shedding light on device behavior and dynamics through computer modeling. Supplying a deeper understanding of the current and future state of optical systems and networks, this Second Edition: Reflects the latest developments in optical fiber communications technology Includes new and updated case studies, examples, end-of-chapter problems, and MATLAB® and Simulink® models Emphasizes DSP-based coherent reception techniques essential to advancement in short- and long-term optical transmission networks Optical Fiber Communication Systems with MATLAB® and Simulink® Models, Second Edition is intended for use in university and professional training courses in the specialized field of optical communications. This text should also appeal to students of engineering and science who have already taken courses in electromagnetic theory, signal processing, and digital communications, as well as to optical engineers, designers, and practitioners in industry.

Modern Communications Jamming Principles and Techniques-Richard Poisel 2011 This edition features a wealth of new material on urban warfare, including a computer simulation of EW architecture alternatives for land-based forces based on urban constraints. It also includes an expanded section on time-hopped spread spectrum communications, more details on modern communication system technologies such as CDMA and OFDM, and an in-depth discussion on sources of urban noise. This practical resource is focused on showing the reader how to design and build jammers specifically targeted at spread spectrum, anti-jam communications. Moreover, it gives assistance in evaluating the expected performance of jamming systems against modern communications systems, and discover the best waveform to use to counter communication systems designed to be effective in jamming environments. While mathematical derivations in general are avoided, the book presents error rate performance equations for most modern digital anti-jam communication systems

Wireless Communication Systems-Xiaodong Wang 2004 Wireless Communication Systems: Advanced Techniques for Signal Receptionoffers a unified frameworkfor understanding today's newest techniques for signal processing in communication systems - andusing them to design receivers for emerging wireless systems. Two leading researchers cover a fullrange of physical-layer issues, including multipath, dispersion, interference, dynamism, andmultiple-antenna systems. Topics include blind, group-blind, space-time, and turbo multiuserdetection; narrowband interference suppression; Monte Carlo Bayesian signal processing; fast fadingchannels; advanced signal processing in coded OFDM systems, and more.

Modeling and Tools for Network Simulation-Klaus Wehrle 2010-09-22 A crucial step during the design and engineering of communication systems is the estimation of their performance and behavior; especially for mathematically complex or highly dynamic systems network simulation is particularly useful. This book focuses on tools, modeling principles and state-of-the art models for discrete-event based network simulations, the standard method applied today in academia and industry for performance evaluation of new network designs and architectures. The focus of the tools part is on two distinct simulations engines: OmNet++ and ns-3, while it also deals with issues like parallelization, software integration and hardware simulations. The parts dealing with modeling and models for network simulations are split into a wireless section and a section dealing with higher layers. The wireless section covers all essential modeling principles for dealing with physical layer, link layer and wireless channel behavior. In addition, detailed models for prominent wireless systems like IEEE 802.11 and IEEE 802.16 are presented. In the part on higher layers, classical modeling approaches for the network layer, the transport layer and the application layer are presented in addition to modeling approaches for peer-to-peer networks and topologies of networks. The modeling parts are accompanied with catalogues of model implementations for a large set of different simulation engines. The book is aimed at master students and PhD students of computer science and electrical engineering as well as at researchers and practitioners from academia and industry that are dealing with network simulation at any layer of the protocol stack.

Principles of Modern Wireless Communication Systems-Aditya K. Jagannatham Wireless telecommunications is a key technology sector with tremendous opportunities for growth and development around the world. Recent years have seen an explosion in terms of the available wireless technologies such as mobile cellular networks for voice and packet data, wireless local area networks, Bluetooth, and so on. Yet, the wireless revolution is very nascent and the 21st century is going to see tremendous diversification of wireless applications in 3G and 4G cellular networks such as rich multimedia-integrated voice-video communication, video-conferencing-based interactive services, multiuser gaming, and strategic surveillance for defence. The book comprehensively covers the fundamental technological advances that have led to progress in the area of wireless communication systems in recent years. Salient Features • Strong emphasis on ad-hoc networks and new trends in mobile/wireless communication • Introduces 3G/4G standards such as HSDPA, LTE, WiMAX to help students understand practical aspects • Demonstrates a deep theoretical understanding of network analysis along with its real-world applications • Detailed description of radio propagation over wireless channel and its limitations • Problem-solving-based approach to enhance understanding • Blend of analytical and simulation-based problems and examples for better understanding of concepts • Pedagogy includes Over 90 illustrations Over 34 Solved Examples Over 103 Practice Questions

Principles of Digital Communication-

Contemporary Communication Systems Using MATLAB-John G. Proakis 2012-07-19 Featuring a variety of applications that motivate students, this book serves as a companion or supplement to any of the comprehensive textbooks in communication systems. The book provides a variety of exercises that may be solved on the computer using MATLAB. By design, the treatment of the various topics is brief. The authors provide the motivation and a short introduction to each topic, establish the necessary notation, and then illustrate the basic concepts by means of an example. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Geolocation of RF Signals-Ilir Progri 2011-01-15 Geolocation of RF Signals—Principles and Simulations offers an overview of the best practices and innovative techniques in the art and science of geolocation over the last twenty years. It covers all research and development aspects including theoretical analysis, RF signals, geolocation techniques, key block diagrams, and practical principle simulation examples in the frequency band from 100 MHz to 18 GHz or even 60 GHz. Starting with RF signals, the book progressively examines various signal bands – such as VLF, LF, MF, HF, VHF, UHF, L, S, C, X, Ku, and, K and the corresponding geolocation requirements per band and per application – to achieve required performance objectives of up to 0o precision. Part II follows a step-by-step approach of RF geolocation techniques and concludes with notes on state-of-the-art geolocation designs as well as advanced features found in signal generator instruments. Drawing upon years of practical experience and using numerous examples and illustrative applications, Ilir Progri provides a comprehensive introduction to Geolocation of RF Signals, and includes hands-on real world labs and applications using MATLAB in the areas of: RF signals specifications, RF geolocation distributed wireless communications networks and RF geolocation. Geolocation of RF Signals—Principles and Simulations will be of interest to government agency program managers industry professionals and engineers, academic researchers, faculty and graduate students who are interested in or currently designing, developing and deploying innovative geolocation of RF Signal systems.

Wireless Communication Signals-Huseyin Arslan 2021-05-04 This book describes wireless communication systems and concepts from modeling, simulation, testing, and wireless systems analyzing (along with wireless circuits) using modern instrumentation and computer aided design software. Readers learn how to model, simulate, test, and analyze wireless systems (along with wireless circuits) using modern instrumentation and computer aided design software. The book is structured in such a way that it can be used in support of various wireless courses at all levels and can serve as a reference for research projects for both undergraduate and graduate students. This book complements traditional theoretical textbooks by also introducing some practical aspects.

Satellite Communications Payload and System-Teresa M. Braun 2012-08-06 This is the first book primarily about the satellite payload of satellite communications systems. It represents a unique combination of practical systems engineering and communications theory. It tells about the satellites in geostationary and low-earth orbits today, both the so-called bent-pipe payloads and the processing payloads. The on-orbit environment, mitigated by the spacecraft bus, is described. The payload units (e.g. antennas and amplifiers), as well as payload-integration elements (e.g. waveguide and switches) are discussed in regard to how they work, what they do to the signal, their technology, environment sensitivity, and specifications. At a higher level are discussions on the payload as an entity: architecture including redundancy; specifications--what they mean, how they relate to unit specifications, and how to verify; and specification-compliance analysis (“budgets”) with uncertainty. Aspects of probability theory handy for calculating and using uncertainty and variation are presented. The highest-level discussions, on the end-to-end communications system, start with a practical introduction to physical-layer communications theory. Atmospheric effects and interference on the communications link are described. A chapter gives an example of optimizing a multibeam payload via probabilistic analysis. Finally, practical tips on system simulation and emulation are provided. The carrier frequencies treated are 1 GHz and above. Familiarity with Fourier analysis will enhance understanding of some topics. References are provided throughout the book for readers who want to dig deeper. Payload systems engineers, payload proposal writers, satellite-communications systems designers and analysts, and satellite customers will find that the book cuts their learning time. Spacecraft-bus systems engineers, payload unit engineers, and spacecraft operators will gain insight into the overall system. Students in systems engineering, microwave engineering, communications theory, probability theory, and communications simulation and modelling will find examples to supplement theoretical texts.

Simulation Models of Mobile Communication Networks-Phuong Tran 2013-08 Scientific Study from the year 2007 in the subject Engineering - Communication Technology, grade: none, Ton Duc Thang University, 35 entries in the bibliography, language: English, abstract: This book is resulted from an electrical engineering research project at Ton Duc Thang University - Ho Chi Minh City in Vietnam. In this book, the authors introduce both fundamental theory and practical issues about mobile communication networks, including GSM networks, CDMA-based networks, MC-CDMA and MTC-MC-CDMA networks. Each issue is introduced together with simulation model written in MATLAB and/or SIMULINK. Most part of this book (chapters 2-5) can be used as a useful reference book for undergraduate students who are studying mobile communication, especially about simulation aspect. Other remaining parts is dedicated for graduate students, that is, some sections in chapter 4,5 and the whole chapter 6.

Handbook of Simulation-Jerry Banks 1998-09-14 The only complete guide to all aspects and uses of simulation—from the international leaders in the field There has never been a single definitive source of key information on all facets of discrete-event simulation and its applications to major industries. The Handbook of Simulation brings together the contributions of leading academics, practitioners, and software developers to offer authoritative coverage of the principles, techniques, and uses of discrete-event simulation. Comprehensive in scope and thorough in approach, the Handbook is the one reference on discrete-event simulation that every industrial engineer, management scientist, computer scientist, operations manager, or operations researcher involved in problem-solving should own, with an in-depth examination of: * Simulation methodology, from experimental design to data analysis and more * Recent advances, such as object-oriented simulation, on-line simulation, and parallel and distributed simulation * Applications across a full range of manufacturing and service industries * Guidelines for successful simulations and sound simulation project management * Simulation software and simulation industry vendors

The Best of the Best-William H. Tranter 2007 The book divides these 50 papers into two major categories (Communications and Networking) and groups them by decade.

Antennas and Propagation for Wireless Communication Systems-Simon Saunders 2007-05-25 Antennas and propagation are of fundamental importance to the coverage, capacity and quality of all wireless communication systems. This book provides a solid grounding in antennas and propagation, covering terrestrial and satellite radio systems in both mobile and fixed contexts. Building on the highly successful first edition, this fully updated text features significant new material and brand new exercises and supplementary materials to support course tutors. A vital source of information for practising and aspiring wireless communication engineers as well as for students at postgraduate and senior undergraduate levels, this book provides a fundamental grounding in the principles of antennas and propagation without excessive recourse to mathematics. It also equips the reader with practical prediction techniques for the design and analysis of a very wide range of common wireless communication systems. Including: Overview of the fundamental electromagnetic principles underlying propagation and antennas. Basic concepts of antennas and their application to specific wireless systems. Propagation measurement, modelling and prediction for fixed links, macrocells, microcells, picocells and megacells Narrowband and wideband channel modelling and the effect of the channel on communication system performance. Methods that overcome and transform channel impairments to enhance performance using diversity, adaptive antennas and equalisers. Key second edition updates: New chapters on Antennas for Mobile Systems and Channel Measurements for Mobile Radio Systems. Coverage of new technologies, including MIMO antenna systems, Ultra Wideband (UWB) and the OFDM technology used in Wi-Fi and WiMax systems. Many new propagation models for macrocells, microcells and picocells. Fully revised and expanded end-of-chapter exercises. The Solutions Manual can be requested from http://www.wiley.com/go/saunders_antennas_2e

Fundamentals of Digital Communication-Upamanyu Madhow 2008-03-06 This is a concise presentation of the concepts underlying the design of digital communication systems, without the detail that can overwhelm students. Many examples, from the basic to the cutting-edge, show how the theory is used in the design of modern systems and the relevance of this theory will motivate students. The theory is supported by practical algorithms so that the student can perform computations and simulations. Leading edge topics in coding and wireless communication make this an ideal text for students taking just one course on the subject. Fundamentals of Digital Communications has coverage of turbo and LDPC codes in sufficient detail and clarity to enable hands-on implementation and performance evaluation, as well as 'just enough' information theory to enable computation of performance benchmarks to compare them against. Other unique features include space-time communication and geometric insights into noncoherent communication and equalization.

Principles of Inductive Near Field Communications for Internet of Things-Johnson I. Agbinya 2011 Near field communication devices and the emerging field of Internet of things require efficient short range communication techniques. Classical telecommunication theory however has so far focused on radiating electromagnetic signals which is more suited to terrestrial communication systems. Over the last decade however considerable research and applications of inductive methods have emerged as innovative approaches for secure short range communications by changing the paradigm of an established model of electromagnetic communications. We have witnessed the emergence of embedded inductive medical devices, magneto-inductive waveguides, inductive pots and cooking devices, magneto-inductive sensors, wireless power transfer, inductive hearing aids and the emerging inductive point-to-point communication specifically termed near-field communication (NFC) as used in mobile phones and payment cards to name a few. While there exist a large set of distributed methods and algorithms detailing the design and performances of such applications, a significant gap is observed as a lack of detailed collection of the methods in one place which could be easily understood and used quickly by someone seeking to apply the methods. In this book this missing gap is filled with the required details and the theory of near field communication systems including both the radiating and reactive (energy coupling) near-field systems in addition to the well known far field radiation techniques. The book details the fundamental expressions and design methods which facilitate the creation of near field devices and equipment including embedded biomedical implants. The book contains recent advances in inductive communications, performance, limitations and a collection of applications. It also lays a strong foundation for the application of inductive methods for creating Internet of Things systems.

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