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4KTY2C - JACKSON MAHONEY

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.

The Best of the Best: Fifty Years of Communications and Networking Research consists of a group of 50 papers selected as the best published by ComSoc in its various journals in the Society's 50-year history. The editors of the collection have written an essay to introduce the papers and discuss the historical significance of the collection and how they were selected for the collection. The book divides the papers into two major categories (Communications and Networking) and groups them by decade within these major subdivisions.

Keeping up to date with the most current technologies in the field is essential for all effective electrical and computer engineers. The updated 7th edition of Principles of Communications presents the reader with more in-chapter examples, providing for a more supportive framework for learning. Readers are exposed to digital data transmission techniques earlier in the book, so they can appreciate the characteristics of digital communication systems prior to learning about probability and stochastic processes. They will also find expanded forward error correction code examples, and additional MATLAB problems.

Thorough coverage of basic digital communication system principles ensures that readers are exposed to all basic relevant topics in digital communication system design. The use of CD player and JPEG image coding standard as examples of systems that employ modern communication principles allows readers to relate the theory to practical systems. Over 180 worked-out examples throughout the book aids readers in understanding basic concepts. Over 480 problems involving applications to practical systems such as satellite communications systems, ionospheric channels, and mobile radio channels gives readers ample opportunity to practice the concepts they have just learned. With an emphasis on digital communications, Communication Systems Engineering, Second Edition introduces the basic principles underlying the analysis and design of communication systems. In addition, this book gives a solid introduction to analog communications and a review of important mathematical foundation topics. New material has been added on wireless communication systems—GSM and CDMA/IS-94; turbo codes and iterative decoding; multicarrier (OFDM) systems; multiple antenna systems. Includes thorough coverage of basic digital communication system principles—including source coding, channel coding, baseband and carrier modulation, channel distortion, channel equal-

ization, synchronization, and wireless communications. Includes basic coverage of analog modulation such as amplitude modulation, phase modulation, and frequency modulation as well as demodulation methods. For use as a reference for electrical engineers for all basic relevant topics in digital communication system design.

Enables engineers and researchers to understand the fundamentals and applications of device-to-device communications and its optimization in wireless networking.

GUIDE TO WIRELESS COMMUNICATIONS, 3rd Edition is designed for an entry level course in wireless data communications. The text covers the fundamentals wireless communications and provides an overview of protocols, transmission methods, and IEEE standards. GUIDE TO WIRELESS COMMUNICATIONS, 3rd Edition examines the broad range of wireless communications technologies available beginning with the basics of radio frequency and wireless data transmission and progressing to the protocols and mechanisms that every wireless network technician should understand. Key topics cover several technologies for Wireless Personal Area Networks (WPANs), Wireless Local Area Networks (WLANs), Wireless Metropolitan Area Networks (WMANs), and Wireless Wide Area Networks (WWANs) giving an overview of the most current cellular and satellite communications. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Electronic Noise and Interfering Signals is a comprehensive reference book on noise and interference in electronic circuits, with particular focus on low-noise design. The first part of the book deals with mechanisms, modelling, and computation of intrinsic noise which is generated in every electronic device. The second part analyzes the coupling mechanisms which can lead to a contamination of circuits by parasitic signals and provides appropriate solutions to this problem. The last part contains more than 100 practical, elaborate case studies. The book requires no advanced mathematical training as it introduces the fundamental methods. Moreover, it provides insight into computational noise analysis with SPICE and NOF, a software developed by the author. The book addresses designers of electronic circuits as well as researchers from electrical engineering, physics, and material science. It should also be of interest for undergraduate and graduate students.

Effective project management tailored to the needs of the telecommunications industry "In our rapidly changing world, the information and communication technologies and services have an immense impact on virtually all aspects of our lives. . . . With his deep understanding of the telecommunication services, and his rich experiences in both standardization activities and teaching practice, [Dr. Sherif's] book provides a very clear analysis of development projects in telecommunication services.

I believe the readers will find this book very useful and interesting." —Houlin Zhao, Director, Telecommunication Standardization Bureau, International Telecommunication Union "Dr. Sherif's book is an important contribution to the project management literature. With the domination of the service economy in recent years, the book addresses the unique features of telecommunication services, a critical pillar of the service sector. Development projects in telecommunications require combining good knowledge of the fundamentals of project management with clear understanding of the complexities arising from fast-changing technology, deregulations, standards, accountability, and supply chain management difficulties. This book addresses the much-needed integrative approach very well." —Tarek Khalil, President, International Association for Management of Technology (IAMOT) While there has been much written about project management, the vast majority of the literature focuses on industrial design and production. In *Managing Projects in Telecommunication Services*, Mostafa Hashem Sherif effectively demonstrates the unique requirements of projects in telecommunication services and, consequently, the benefits of an integrated approach to project management that is specifically tailored to the telecommunications industry. *Managing Projects in Telecommunication Services* draws from a wide range of disciplines, including organizational management, motivation, quality control, and software engineering. All the theory and practical guidance that an effective telecommunications project manager needs is provided. The text is divided into three main parts: Chapters 1 through 3 set forth the special characteristics of telecommunications projects, including technology life cycle, type of innovation, and project organization Chapters 4 through 10 cover the areas that the Project Management Institute has standardized in its publication *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*, focusing on the issues specific to telecommunications. Chapters address scope, schedule and cost, information and communication, human resources, quality, vendor management, and risk Chapters 11 and 12 integrate and summarize all of the concepts for the planning and delivery of a project Chapters are loaded with examples and case studies, many from the author's personal experience, that demonstrate the benefits of good project management and the consequences of poor project management. Each chapter includes a summary of key points. References are also provided to facilitate further research and study. For project managers as well as students in telecommunications, this text is unsurpassed. It not only covers the theory and practice of effective project management, it also tailors its discussion specifically to the unique needs of the telecommunications industry. (PMBOK is a registered mark of the Project Management Institute, Inc.)

This book presents current theories of diffraction, imaging, and related topics based on Fourier analysis and synthesis techniques, which are essential for understanding, analyzing, and synthesizing modern imaging, optical communications and networking, as well as micro/nano systems. Applications covered include tomography; magnetic resonance imaging; synthetic aperture radar (SAR) and interferometric SAR; optical communications and networking devices; computer-generated holograms and analog holograms; and wireless systems using EM waves.

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 pro-

posed 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.

Providing the underlying principles of digital communication and the design techniques of real-world systems, this textbook prepares senior undergraduate and graduate students for the engineering practices required in industry. Covering the core concepts, including modulation, demodulation, equalization, and channel coding, it provides step-by-step mathematical derivations to aid understanding of background material. In addition to describing the basic theory, the principles of system and subsystem design are introduced, enabling students to visualize the intricate connections between subsystems and understand how each aspect of the design supports the overall goal of achieving reliable communications. Throughout the book, theories are linked to practical applications with over 250 real-world examples, whilst 370 varied homework problems in three levels of difficulty enhance and extend the text material. With this textbook, students can understand how digital communication systems operate in the real world, learn how to design subsystems, and evaluate end-to-end performance with ease and confidence.

For second and third year introductory communication systems courses for undergraduates, or an introductory graduate course. This revision of Couch's authoritative text provides the latest treatment of digital communication systems. The author balances coverage of both digital and analog communication systems, with an emphasis on design. Students will gain a working knowledge of both classical mathematical and personal computer methods to analyze, design, and simulate modern communication systems. MATLAB is integrated throughout.

Introduction to Digital Communications explores the basic principles in the analysis and design of digital communication systems, including design objectives, constraints and trade-offs. After portraying the big picture and laying the background material, this book lucidly progresses to a comprehensive and detailed discussion of all critical elements and key functions in digital communications. The first undergraduate-level textbook exclusively on digital communications, with a complete coverage of source and channel coding, modulation, and synchronization. Discusses major aspects of communication networks and multiuser communications Provides insightful descriptions and intuitive explanations of all complex concepts Focuses on practical applications and illustrative examples. A companion Web site includes solutions to end-of-chapter problems and computer exercises, lecture

slides, and figures and tables from the text

This text combines the fundamentals of electromagnetics with numerical modeling to tackle a broad range of current electromagnetic compatibility (EMC) problems, including problems with lightning, transmission lines, and grounding systems. It sets forth a solid foundation in the basics before advancing to specialized topics, and allows readers to develop their own EMC computational models for applications in both research and industry.

An accessible undergraduate textbook introducing key fundamental principles behind modern communication systems, supported by exercises, software problems and lab exercises.

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.

Wireless technology is a truly revolutionary paradigm shift, enabling multimedia communications between people and devices from any location. It also underpins exciting applications such as sensor networks, smart homes, telemedicine, and automated highways. This book provides a comprehensive introduction to the underlying theory, design techniques and analytical tools of wireless communications, focusing primarily on the core principles of wireless system design. The book begins with an overview of wireless systems and standards. The characteristics of the wireless channel are then described, including their fundamental capacity limits. Various modulation, coding, and signal processing schemes are then discussed in detail, including state-of-the-art adaptive modulation, multi-carrier, spread spectrum, and multiple antenna techniques. The concluding chapters deal with multiuser communications, cellular system design, and ad-hoc network design. Design insights and tradeoffs are emphasized throughout the book. It contains many worked examples, over 200 figures, almost 300 homework exercises, over 700 references, and is an ideal textbook for students.

An accessible, yet mathematically rigorous, one-semester textbook, engaging students through use of problems, examples, and applications.

The clear, easy-to-understand introduction to digital communications Completely updated coverage of today's most critical technologies Step-by-step implementation coverage Trellis-coded modulation, fading channels, Reed-Solomon codes, encryption, and more Exclusive coverage of maximizing performance with advanced "turbo codes" "This is a remarkably comprehensive treatment of the field, covering in considerable detail modulation, coding (both source and channel), encryption, multiple access and spread spectrum. It can serve both as an excellent introduction for the graduate student with some background in probability theory or as a valuable reference for the practicing ommu-

nication system engineer. For both communities, the treatment is clear and well presented." - Andrew Viterbi, The Viterbi Group Master every key digital communications technology, concept, and technique. Digital Communications, Second Edition is a thoroughly revised and updated edition of the field's classic, best-selling introduction. With remarkable clarity, Dr. Bernard Sklar introduces every digital communication technology at the heart of today's wireless and Internet revolutions, providing a unified structure and context for understanding them -- all without sacrificing mathematical precision. Sklar begins by introducing the fundamentals of signals, spectra, formatting, and base-band transmission. Next, he presents practical coverage of virtually every contemporary modulation, coding, and signal processing technique, with numeric examples and step-by-step implementation guidance. Coverage includes: Signals and processing steps: from information source through transmitter, channel, receiver, and information sink Key tradeoffs: signal-to-noise ratios, probability of error, and bandwidth expenditure Trellis-coded modulation and Reed-Solomon codes: what's behind the math Synchronization and spread spectrum solutions Fading channels: causes, effects, and techniques for withstanding fading The first complete how-to guide to turbo codes: squeezing maximum performance out of digital connections Implementing encryption with PGP, the de facto industry standard Whether you're building wireless systems, xDSL, fiber or coax-based services, satellite networks, or Internet infrastructure, Sklar presents the theory and the practical implementation details you need. With nearly 500 illustrations and 300 problems and exercises, there's never been a faster way to master advanced digital communications. CD-ROM INCLUDED The CD-ROM contains a complete educational version of Elanix' SystemView DSP design software, as well as detailed notes for getting started, a comprehensive DSP tutorial, and over 50 additional communications exercises.

This book presents a systematic, comprehensive treatment of analog and discrete signal analysis and synthesis and an introduction to analog communication theory. This evolved from my 40 years of teaching at Oklahoma State University (OSU). It is based on three courses, Signal Analysis (a second semester junior level course), Active Filters (a first semester senior level course), and Digital signal processing (a second semester senior level course). I have taught these courses a number of times using this material along with existing texts. The references for the books and journals (over 160 references) are listed in the bibliography section. At the undergraduate level, most signal analysis courses do not require probability theory. Only, a very small portion of this topic is included here. I emphasized the basics in the book with simple mathematics and the sophistication is minimal. Theorem-proof type of material is not emphasized. The book uses the following model: 1. Learn basics 2. Check the work using bench marks 3. Use software to see if the results are accurate The book provides detailed examples (over 400) with applications. A three-number system is used consisting of chapter number - section number - example or problem number, thus allowing the student to quickly identify the related material in the appropriate section of the book. The book includes well over 400 homework problems. Problem numbers are identified using the above three-number system.

Phase-Locked Loops for Wireless Communications: Digital, Analog and Optical Implementations, Second Edition presents a complete tutorial of phase-locked loops from analog implementations to digital and optical designs. The text establishes a thorough foundation of continuous-time analysis techniques and maintains a consistent notation as discrete-time and non-uniform sampling are presented. New to this edition is a complete treatment of charge pumps and the complementary sequential

phase detector. Another important change is the increased use of MATLAB®, implemented to provide more familiar graphics and reader-derived phase-locked loop simulation. Frequency synthesizers and digital divider analysis/techniques have been added to this second edition. Perhaps most distinctive is the chapter on optical phase-locked loops that begins with sections discussing components such as lasers and photodetectors and finishing with homodyne and heterodyne loops. Starting with a historical overview, presenting analog, digital, and optical PLLs, discussing phase noise analysis, and including circuits/algorithms for data synchronization, this volume contains new techniques being used in this field. Highlights of the Second Edition: Development of phase-locked loops from analog to digital and optical, with consistent notation throughout; Expanded coverage of the loop filters used to design second and third order PLLs; Design examples on delay-locked loops used to synchronize circuits on CPUs and ASICs; New material on digital dividers that dominate a frequency synthesizer's noise floor. Techniques to analytically estimate the phase noise of a divider; Presentation of optical phase-locked loops with primers on the optical components and fundamentals of optical mixing; Section on automatic frequency control to provide frequency-locking of the lasers instead of phase-locking; Presentation of charge pumps, counters, and delay-locked loops. The Second Edition includes the essential topics needed by wireless, optics, and the traditional phase-locked loop specialists to design circuits and software algorithms. All of the material has been updated throughout the book.

The four short years since *Digital Communication over Fading Channels* became an instant classic have seen a virtual explosion of significant new work on the subject, both by the authors and by numerous researchers around the world. Foremost among these is a great deal of progress in the area of transmit diversity and space-time coding and the associated multiple input-multiple output (MIMO) channel. This new edition gathers these and other results, previously scattered throughout numerous publications, into a single convenient and informative volume. Like its predecessor, this Second Edition discusses in detail coherent and noncoherent communication systems as well as a large variety of fading channel models typical of communication links found in the real world. Coverage includes single- and multichannel reception and, in the case of the latter, a large variety of diversity types. The moment generating function (MGF)-based approach for performance analysis, introduced by the authors in the first edition and referred to in literally hundreds of publications, still represents the backbone of the book's presentation. Important features of this new edition include: * An all-new, comprehensive chapter on transmit diversity, space-time coding, and the MIMO channel, focusing on performance evaluation * Coverage of new and improved diversity schemes * Performance analyses of previously known schemes in new and different fading scenarios * A new chapter on the outage probability of cellular mobile radio systems * A new chapter on the capacity of fading channels * And much more *Digital Communication over Fading Channels, Second Edition* is an indispensable resource for graduate students, researchers investigating these systems, and practicing engineers responsible for evaluating their performance.

This book provides a cohesive introduction to much of the vast body of knowledge central to the problems of communication engineering.

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. Never-

theless, 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.

An introductory treatment of communication theory as applied to the transmission of information-bearing signals with attention given to both analog and digital communications. Chapter 1 reviews basic concepts. Chapters 2 through 4 pertain to the characterization of signals and systems. Chapters 5 through 7 are concerned with transmission of message signals over communication channels. Chapters 8 through 10 deal with noise in analog and digital communications. Each chapter (except chapter 1) begins with introductory remarks and ends with a problem set. Treatment is self-contained with numerous worked-out examples to support the theory. · Fourier Analysis · Filtering and Signal Distortion · Spectral Density and Correlation · Digital Coding of Analog Waveforms · Intersymbol Interference and Its Cures · Modulation Techniques · Probability Theory and Random Processes · Noise in Analog Modulation · Optimum Receivers for Data Communication

"This self-study text for practicing engineers and scientists explains the mathematical tools that are required for advanced technological applications, but are often not covered in undergraduate school. The authors (University of Central Florida) describe special functions, matrix methods, vector operations, the transformation laws of tensors, the analytic functions of a complex variable, integral transforms, partial differential equations, probability theory, and random processes. The book could also serve as a supplemental graduate text."--Memento.

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.

This textbook covers the fundamental concepts of analog communications with a Q&A approach. It is a comprehensive compilation of numerical problems and solutions covering all the topics in analog communications. Richly illustrated with figures, this book covers the important topics of signals and

systems, random variables and random processes, amplitude modulation, frequency modulation, pulse code modulation and noise in analog modulation. It has numerical questions and their solutions clearing the concepts of Fourier transform, Hilbert transform, modulation, synchronization, signal-to-noise ratio analysis and many more. All the solutions have step-by-step approach for easy understanding. This book will be of great interest to the students of electronics and electrical communications engineering.

This book is an introduction to numerical analysis and intends to strike a balance between analytical rigor and the treatment of particular methods for engineering problems. Emphasizes the earlier stages of numerical analysis for engineers with real-life problem-solving solutions applied to computing and engineering. Includes MATLAB oriented examples. An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department.