

Principle Of Communication Engg Note

A Comprehensive coverage of Digital communication, Data Communication Protocols and Mobile Computing Covers: " Multiplexing & Multiple accesses" Radio Communications- Terrestrial & Satellite" Error Detection & Correction" ISO/ OSI Protocol Architecture" Wired Internet DNS, RADIUS, Firewalls, VPN" Cellular Mobile Communication" GPS, CTI, Wireless Internet" Multimedia Communication over IP Networks

"This book addresses the complex issues associated with software engineering environment capabilities for designing real-time embedded software systems"--Provided by publisher.

This book contains papers on selected aspects of dependability analysis in computer systems and networks, which were chosen for discussion during the 16th DepCoS-RELCOMEX conference held in Wroc?aw, Poland, from June 28 to July 2, 2021. Their collection will be a valuable source material for scientists, researchers, practitioners and students who are dealing with design, analysis and engineering of computer systems and networks and must ensure their dependable operation. Being probably the most complex technical systems ever engineered by man (and also--the most dynamically evolving ones), organization of contemporary computer systems cannot be interpreted only as structures built on the basis of (unreliable) technical resources. Their evaluation must take into account a specific blend of interacting people (their needs and behaviours), networks (together with mobile properties, cloud organization, Internet of Everything, etc.) and a large number of users dispersed geographically and constantly producing an unconceivable number of applications. Ever-growing number of research methods being continuously developed for dependability analyses apply the newest techniques of artificial and computational intelligence. Selection of papers in these proceedings illustrates diversity of multi-disciplinary topics which are considered in present-day dependability explorations.

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

Graduate-level study for engineering students presents elements of modern probability theory, elements of information theory with emphasis on its basic roots in probability theory and elements of coding theory. Emphasis is on such basic concepts as sets, sample space, random variables, information measure, and capacity. Many reference tables and extensive bibliography. 1961 edition.

This is the second edition of the standard text on design theory. Exercises are included throughout, and the book concludes with an extensive and updated bibliography of well over 1800 items.

This revised edition of Software Engineering-Principles and Practices has become more comprehensive with the inclusion of several topics. The book now offers a complete understanding of software engineering as an engineering discipline. Like its previous edition, it provides an in-depth coverage of fundamental principles, methods and applications of software engineering. In addition, it covers some advanced approaches including Computer-aided Software Engineering (CASE), Component-based Software Engineering (CBSE), Clean-room Software Engineering (CSE) and formal methods. Taking into account the needs of both students and practitioners, the book presents a pragmatic picture of the software engineering methods and tools. A thorough study of the software industry shows that there exists a substantial difference between classroom study and the practical industrial application. Therefore, earnest efforts have been made in this book to bridge the gap between theory and practical applications. The subject matter is well supported by examples and case studies representing the situations that one actually faces during the software development process. The book meets the requirements of students enrolled in various courses both at the undergraduate and postgraduate levels, such as BCA, BE, BTech, BIT, BIS, BSc, PGDCA, MCA, MIT, MIS, MSc, various DOEACC levels and so on. It will also be suitable for those software engineers who abide by scientific principles and wish to expand their knowledge. With the increasing demand of software, the software engineering discipline has become important in education and industry. This thoughtfully organized second edition of the book provides its readers a profound knowledge of software engineering concepts and principles in a simple, interesting and illustrative manner.

An undeniably rich and thorough guide to satellite communication engineering, Satellite Communication Engineering, Second Edition presents the fundamentals of information communications systems in a simple and succinct way. This book considers both the engineering aspects of satellite systems as well as the practical issues in the broad field of information transmission. Implementing concepts developed on an intuitive, physical basis and utilizing a combination of applications and performance curves, this book starts off with a progressive foundation in satellite technology, and then moves on to more complex concepts with ease. What's New in the Second Edition: The second edition covers satellite and Earth station design; global positioning systems; antenna tracking; links and communications systems; error detection and correction; data security; regulations and procedures for system modeling; integration; testing; and reliability and performance evaluation. Provides readers with the systems building blocks of satellite transponders and Earth stations, as well as the systems engineering design procedure Includes the tools needed to calculate basic orbit characteristics such as period, dwell time, coverage area, propagation losses; antenna system features such as size, beamwidth, aperture-frequency product, gain, tracking control; and system requirements such as power, availability, reliability, and performance Presents problem sets and starred sections containing basic mathematical development Details recent developments enabling digital information transmission and delivery via satellite Satellite Communication Engineering, Second Edition serves as a textbook for students and a resource for space agencies and relevant industries.

This volume brings together contributions representing the state-of-the-art in new multimedia and future technology information research, currently a major topic in computer science and electronic engineering. Researchers aim to interoperate multimedia frameworks, transforming the way people work and interact with multimedia data. This book covers future information technology topics including digital and multimedia convergence, ubiquitous and pervasive computing, intelligent computing and applications, embedded systems, mobile and wireless communications, bio-inspired computing, grid and cloud computing, semantic web, human-centric computing and social networks, adaptive and

context-aware computing, security and trust computing and related areas. Representing the combined proceedings of the 9th International Conference on Multimedia and Ubiquitous Engineering (MUE-15) and the 10th International Conference on Future Information Technology (Future Tech 2015), this book aims to provide a complete coverage of the areas outlined and to bring together researchers from academic and industry and other practitioners to share their research ideas, challenges and solutions.

ENGINEERING COMMUNICATION: A PRACTICAL GUIDE TO WORKPLACE COMMUNICATIONS FOR ENGINEERS, 2E is ideal for both future and practicing engineers.

Predicated on the successful dynamic analysis model CMAPP (context, message, audience, purpose and product), this practical guide provides readers with a variety of communication strategies. Engineers gain important help in creating the types of proposals, reports, memos, letters, job application documents, and digital/social media publications that are most needed for today's workplace. Interrelated case studies and exercises help readers develop the critical thinking and planning skills essential in contemporary engineering. Current and future engineers learn to evaluate important ethical and cultural considerations as they master the development of the effective business communication essential in today's careers. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Focuses on and presents watershed research traditions in human communication (interpersonal, organizational, and mass communication).

One of the most diverse and versatile engineering fields, mechanical engineering is the study of objects and systems in motion. As such, the field of mechanical engineering touches virtually every aspect of modern life, including the human body, a highly complex machine. Mechanical engineers are responsible for the design, analysis, testing, and manufacture of machines and other equipment. Mechanical engineering is an incredibly broad and diverse field in the sense of the types of products that mechanical engineers work on, the industries that they work in, and the knowledge required of a mechanical engineer to be successful. This book of Mechanical Engineering is made for students who are interested in pursuing a career as a mechanical engineer and who are already build their careers as a mechanical engineer this book covers lots of important concepts and Formulae needed to excel in competitive examinations. Mechanical engineers play key roles in a wide range of industries including automotive, aerospace, biotechnology, computers, electronics, microelectromechanical systems, energy conversion, robotics and automation, and manufacturing. Possibly the most important factor for success as a mechanical engineer is an unquenchable thirst for knowledge and understanding. The most successful engineers are constantly pushing to learn more and to improve their skills. Learning doesn't stop once you graduate from college. A field as large as mechanical engineering is impossible to fully grasp after only four short years in the classroom. The best engineers realize this and push to improve every day. The purpose of the third edition of the Handbook of Principle of Mechanical Engineering is to continue providing practicing engineers in industry, government, and academia with up-to-date information on the most important topics of modern mechanical engineering. This book provides a comprehensive and wide-ranging introduction to the fundamental principles of mechanical engineering in a distinct and clear manner. The book is intended for a core introductory course in the area of foundations and applications of mechanical engineering. The book is written in simple language to describe each topic in a brief manner that offers optimum support to the learners. The book of Mechanical Engineering covers Below Subjects Mechanical measurement, and Statistics Machine Design Mechatronics Power Engineering Theory of Machine Material Science Industrial Engineering Automobile Engineering IC engines, Thermodynamics Manufacturing Technology Hydraulic and Pneumatic System

This book covers diverse aspects of advanced computer and communication engineering, focusing specifically on industrial and manufacturing theory and applications of electronics, communications, computing and information technology. Experts in research, industry, and academia present the latest developments in technology, describe applications involving cutting-edge communication and computer systems, and explore likely future trends. In addition, a wealth of new algorithms that assist in solving computer and communication engineering problems are presented. The book is based on presentations given at ICOCOE 2015, the 2nd International Conference on Communication and Computer Engineering. It will appeal to a wide range of professionals in the field, including telecommunication engineers, computer engineers and scientists, researchers, academics and students.

Explore Modern Communications and Understand Principles of Operations, Appropriate Technologies, and Elements of Design of Communication Systems Modern society requires a different set of communication systems than has any previous generation. To maintain and improve the contemporary communication systems that meet ever-changing requirements, engineers need to know how to recognize and solve cardinal problems. In Essentials of Modern Communications, readers will learn how modern communication has expanded and will discover where it is likely to go in the future. By discussing the fundamental principles, methods, and techniques used in various communication systems, this book helps engineers assess, troubleshoot, and fix problems that are likely to occur. In this reference, readers will learn about topics like: How communication systems respond in time and frequency domains Principles of analog and digital modulations Application of spectral analysis to modern communication systems based on the Fourier series and Fourier transform Specific examples and problems, with discussions around their optimal solutions, limitations, and applications Approaches to solving the concrete engineering problems of modern communications based on critical, logical, creative, and out-of-box thinking For readers looking for a resource on the fundamentals of modern communications and the possible issues they face, Essentials of Modern Communications is instrumental in educating on real-life problems that engineering students and professionals are likely to encounter.

This systematic and highly readable work provides thorough coverage of background information, techniques and design criteria, and system economics. It provides systems engineers and students training for the aerospace industry with a practical, self-contained guide to the field.

Addressing the fundamental technologies and theories associated with designing complex communications systems and networks, Principles of Communications Networks and Systems provides models and analytical methods for evaluating their performance. Including both the physical layer (digital transmission and modulation) and networking topics, the quality of service concepts belonging to the different layers of the protocol stack are interrelated to form a comprehensive picture. The book is designed to present the material in an accessible but rigorous manner. It jointly addresses networking and transmission aspects following a unified approach and using a bottom up style of presentation, starting from requirements on transmission links all the way up to the corresponding quality of service at network and application layers. The focus is on presenting the material in an integrated and systematic fashion so that students will have a clear view of all the principal aspects and of how they interconnect with each other. A comprehensive introduction to communications systems and networks, addressing both network and transmission topics Structured for effective learning, with basic principles and technologies being introduced before more advanced ones are explained Features examples of existing systems and recent standards as well as advanced digital modulation techniques such as CDMA and OFDM Contains tools to help the reader in the design and performance analysis of modern communications systems Provides problems at the end of each chapter, with answers on an accompanying website

Entropy Theory and its Application in Environmental and WaterEngineering responds to the need for a book that deals withbasic concepts of entropy theory from a hydrologic and waterengineering perspective and then for a book that deals withapplications of these concepts to a range of water engineeringproblems. The range of applications of entropy is constantlyexpanding and new areas finding a use for the theory arecontinually emerging. The applications of concepts and techniquesvary across different subject areas and this book aims to relatethem directly to practical problems of environmental and waterengineering. The book presents and explains the Principle of Maximum Entropy(POME) and the Principle of Minimum Cross Entropy (POMCE) and theirapplications to different types of probability distributions.Spatial and inverse spatial entropy are important for urbanplanning and are presented with clarity. Maximum entropy spectralanalysis and minimum cross entropy spectral analysis are powerfultechniques for addressing a variety of problems faced byenvironmental and water scientists and engineers and are describedhere with illustrative examples. Giving a thorough introduction to the use of entropy to measurethe unpredictability in environmental and water systems this bookwill add an essential statistical method to the toolkit ofpostgraduates, researchers and academic hydrologists, waterresource managers, environmental scientists and engineers. Itwill also offer a valuable resource for professionals in the sameareas, governmental organizations, private companies as well asstudents in earth sciences, civil and agricultural engineering, andagricultural and rangeland sciences. This book: Provides a thorough introduction to entropy for beginners andmore experienced users Uses numerous examples to illustrate the applications of thetheoretical principles Allows the reader to apply entropy theory to the solution ofpractical problems Assumes minimal existing mathematical knowledge Discusses the theory and its various aspects in both univariateand bivariate cases Covers newly expanding areas including neural networks from anentropy perspective and future developments.

Because of the ease with which we perceive, many people see perception as something that "just happens." However, even seemingly simple perceptual experiences involve complex underlying mechanisms, which are often hidden from our conscious experience. These mechanisms are being investigated by researchers and theorists in fields such as psychology, cognitive science, neuroscience, computer science, and philosophy. A few examples of the questions posed by these investigations are, What do infants perceive? How does perception develop? What do perceptual disorders reveal about normal functioning? How can information from one sense, such as hearing, be affected by information from another sense, such as vision? How is the information from all of our senses combined to result in our perception of a coherent environment? What are some practical outcomes of basic research in perception? These are just a few of the questions this encyclopedia will consider, as it presents a comprehensive overview of the field of perception for students, researchers, and professionals in psychology, the cognitive sciences, neuroscience, and related medical disciplines such as neurology and ophthalmology.

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.

This edited monograph presents the collected interdisciplinary research results of the priority program "Information- and Communication Theory in Molecular Biology (InKoMBio, SPP 1395)", funded by the German Research Foundation DFG, 2010 until 2016. The topical spectrum is very broad and comprises, but is not limited to, aspects such as microRNA as part of cell communication, information flow in mammalian signal transduction pathway, cell-cell communication, semiotic structures in biological systems, as well as application of methods from information theory in protein interaction analysis. The target audience primarily comprises research experts in the field of biological signal processing, but the book is also beneficial for graduate students alike.

Carefully structured to provide practical knowledge on fundamental issues, *Optical Fiber Communications Systems: Theory and Practice with MATLAB® and Simulink® Models* explores advanced modulation and transmission techniques of lightwave communication systems. With coverage ranging from fundamental to modern aspects, the text presents optical communication techniques and applications, employing single mode optical fibers as the transmission medium. With MATLAB and Simulink models that illustrate methods, it supplies a deeper understanding of future development of optical systems and networks. The book begins with an overview of the development of optical fiber communications technology over the last three decades of the 20th century. It describes the optical transmitters for direct and external modulation technique and discusses the detection of optical signals under direct coherent and incoherent reception. The author also covers lumped Er:doped and distributed Raman optical amplifiers with extensive models for the amplification of signals and structuring the amplifiers on the Simulink platform. He outlines a design strategy for optically amplified transmission systems coupled with MATLAB Simulink models, including dispersion and attenuation budget methodology and simulation techniques. The book concludes with coverage of advanced modulation formats for long haul optical fiber transmission systems with accompanied Simulink models. Although many books have been written on this topic over the last two decades, most of them present only the theory and practice of devices and subsystems of the optical fiber communications systems in the fields, but do not illustrate any computer models to represent the true practical aspects of engineering practice. This book fills the need for a text that emphasizes practical computing models that shed light on the behavior and dynamics of the devices.

This textbook introduces the advanced topics of: (i) wireless communications, (ii) free-space optical (FSO) communications, (iii) indoor optical wireless (IR) communications, and (iv) fiber-optics communications and presents these different types of communication systems in a unified fashion for better practical use. Fundamental concepts, such as propagation principles, modulation formats, channel coding, diversity principles, MIMO signal processing, multicarrier modulation, equalization, adaptive modulation and coding, detection principles, and software defined transmission are first described and then followed up with a detailed look at each particular system. The book is self-contained and structured to provide straightforward guidance to readers looking to capture fundamentals and gain theoretical and practical knowledge about wireless communications, optical communications, and fiber-optics communications, all which can be readily applied in studies, research, and practical applications. The textbook is intended for an upper undergraduate or graduate level course in optical communication. It features problems, an appendix with all background material needed, and homework.

Error-correction coding is being used on an almost routine basis in most new communication systems. Not only is coding equipment being used to increase the energy efficiency of communication links, but coding ideas are also providing innovative solutions to many related communication problems. Among these are the elimination of intersymbol interference caused by filtering and multipath and the improved demodulation of certain frequency modulated signals by taking advantage of the "natural" coding provided by a continuous phase. Although several books and numerous articles have been written on coding theory, there are still noticeable deficiencies. First, the practical aspects of translating a specific decoding algorithm into actual hardware have been largely ignored. The information that is available is sketchy and is widely dispersed. Second, the information required to evaluate a particular technique under situations that are encountered in practice is available for the most part only in private company reports. This book is aimed at correcting both of these problems. It is written for the design engineer who must build the coding and decoding equipment and for the communication system engineer who must incorporate this equipment into a system. It is also suitable as a senior-level or first-year graduate text for an introductory one-semester course in coding theory. The book uses a minimum of mathematics and entirely avoids the classical theorem/proof approach that is often seen in coding texts.

Communications technologies increasingly pervade our everyday lives, yet the underlying principles are a mystery to most. Even among engineers and technicians, understanding of this complex subject remains limited. However, there is undeniably a growing need for all technology disciplines to gain intimate awareness of how their fields are affected by a more densely networked world. The computer science field in particular is profoundly affected by the growing dominance of communications, and computer scientists must increasingly engage with electrical engineering concepts. Yet communications technology is often perceived as a challenging subject with a steep learning curve. To address this need, the authors have transformed classroom-tested materials into this accessible textbook to give readers an intimate understanding of fundamental communications concepts. Readers are introduced to the key essentials, and each selected topic is discussed in detail to promote mastery. Engineers and computer scientists will gain an understanding of concepts that can be readily applied to their respective fields, as well as provide the foundation for more advanced study of communications. Provides a thorough grounding in the basics by focusing on select key concepts Clarifies comprehension of the subject via detailed explanation and illustration Helps develop an intuitive sense of both digital and analog principles Introduces key broadcasting, wireless and wired systems Helps bridge the knowledge gap between software and electrical engineering Requires only basic calculus and trigonometry skills Classroom tested in undergraduate CS and EE programs Communications Engineering by Lee, Chiu, and Lin will give advanced undergraduates in computer science and beginning students of electrical engineering a rounded understanding of communications technologies. The book also serves as a key introduction to specialists in industry, or anyone who desires a working understanding of communications technologies.

The last two decades have witnessed an enormous growth with regard to applications of information theoretic framework in areas of physical, biological, engineering and even social sciences. In particular, growth has been spectacular in the field of information technology, soft computing, nonlinear systems and molecular biology. Claude Shannon in 1948 laid the foundation of the field of information theory in the context of communication theory. It is indeed remarkable that his framework is as relevant today as was when he first proposed it. Shannon died on Feb 24, 2001. Arun Netravali observes "As if assuming that inexpensive, high-speed processing would come to pass, Shannon figured out the upper limits on communication rates. First in telephone channels, then in optical communications, and now in wireless, Shannon has had the utmost value in defining the engineering limits we face". Shannon introduced the concept of entropy. The notable feature of the entropy framework is that it enables quantification of uncertainty present in a system. In many realistic situations one is confronted only with partial or incomplete information in the form of moment, or bounds on these values etc. ; and it is then required to construct a probabilistic model from this partial information. In such situations, the principle of maximum entropy provides a rational basis for constructing a probabilistic model. It is thus necessary and important to keep track of advances in the applications of maximum entropy principle to ever expanding areas of knowledge.

Due to a steady flow of requests over several years, Springer-Verlag now provides a corrected reprint of this text. It is designed to serve as a text for a first semester graduate level course for students in digital communication systems. As a pre requisite, it is presumed that the reader has an understanding of basic probability and stochastic processes. The treatment of digital communications in this book is intended to serve as an introduction to the subject. Part one is a development of the elements of statistical communication theory and radar detection. The text begins with a general model of a communication system which is extensively developed and the performance analyses of various conventional systems. The first part also serves as introductory material for the second part of the text which is a comprehensive study of the theory of transmitter optimization for coherent and noncoherent digital communication systems, that is, the theory of signal design.

when certain parameters in the problem tend to limiting values (for example, when the sample size increases indefinitely, the intensity of the noise approaches zero, etc.) To address the problem of asymptotically optimal estimators consider the following important case. Let X_1, X_2, \dots, X_n be independent observations with the joint probability density $f(x, \theta)$ (with respect to the Lebesgue measure on the real line) which depends on the unknown parameter $\theta \in \mathcal{R}^1$. It is required to derive the best (asymptotically) estimator $\hat{\theta}(X_1, \dots, X_n)$ of the parameter θ . The first question which arises in connection with this problem is how to compare different estimators or, equivalently, how to assess their quality, in terms of the mean square deviation from the parameter or perhaps in some other way. The presently accepted approach to this problem, resulting from A. Wald's contributions, is as follows: introduce a nonnegative function $w(\theta) = W(\theta, \theta_0)$ (the loss function) and given two estimators $\hat{\theta}_1$ and $\hat{\theta}_2$ the estimator for which the expected loss (risk) $E_{\theta_0} w(\hat{\theta}_j, \theta_0)$, $j = 1$ or 2 , is smallest is called the better with respect to W at point θ_0 (here E_{θ_0} is the expectation evaluated under the assumption that the true value of the parameter is θ_0). Obviously, such a method of comparison is not without its defects.

An expert guide to the relationship between information theory and the physics of wave propagation, covering stochastic and deterministic approaches, engineering applications, and the universal physical limits of radiation. It is an ideal reference for researchers and graduate students in electrical engineering, physics, and applied mathematics.

The Mathematical Theory of Coding focuses on the application of algebraic and combinatoric methods to the coding theory, including linear transformations, vector spaces, and combinatorics. The publication first offers information on finite fields and coding theory and combinatorial constructions and coding. Discussions focus on self-dual and quasicyclic codes, quadratic residues and codes, balanced incomplete block designs and codes, bounds on code dictionaries, code invariance under permutation groups, and linear transformations of vector spaces over finite fields. The text then takes a look at coding and combinatorics and the structure of semisimple rings. Topics include structure of cyclic codes and semisimple rings, group algebra and group characters, rings, ideals, and the minimum condition, chains and chain groups, dual chain groups, and matroids, graphs, and coding. The book ponders on group representations and group codes for the Gaussian channel, including distance properties of group codes, initial vector problem, modules, group algebras, and representations, orthogonality relationships and properties of group characters, and representation of groups. The manuscript is a valuable source of data for mathematicians and researchers interested in the mathematical theory of coding.

Communication Engineering Principles is aimed at undergraduates in communication engineering, and uses an innovative approach to provide a comprehensive introduction to the subject, imparting a thorough grounding in the fundamental concepts and design issues involved. This book takes the approach that the engineering must come before the mathematics, allowing the reader to appreciate the underlying engineering concepts without being deterred or confused by a needlessly high level of mathematics. Wherever possible, Communication Engineering Principles uses a minimal mathematics approach, employing a clear writing style and lucid graphs and diagrams to aid understanding. The book also coaches the reader in practical problem solving, using examples from a wide range of current applications in communication engineering. After studying the material in this book the reader will have the skill and confidence to deal with more specialist telecommunications topics.

- Provides a firm foundation in the principles of communication engineering
- Takes a minimal mathematics approach, allowing the reader an unclouded view of the fundamental concepts
- Gives an overview of more complex topics
- Includes several unpublished original derivations and insights in modulation, white noise, bit error rates and the matched filter
- Also suitable for short courses in telecommunications for practising engineers and as supplementary reading for MSc Students.

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.

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