

Synchronization Techniques For Digital Receivers 1st Edition | d85cf6f9e0af5c10220ef74864fa94db

Low-Power Wireless Infrared Communications Software-Defined Radio for Engineers Software Receiver Design A Baseband Mixed-signal Receiver Front-end for 1Gbps Wireless Communications at 60GHz Twenty-fourth AIAA International Communication Satellite Systems Conference Academic Press Library in Mobile and Wireless Communications Wireless Communications Fundamentals of Spread Spectrum Modulation Synchronization in Digital Communication Systems ISCAS 2001 Wireless Receiver Architectures and Design GNSS Receivers for Weak Signals Wiley Encyclopedia of Telecommunications, Volume 5 Neural Networks for Signal Processing Digital Radio System Design Digital Communication Techniques Orthogonal Waveforms and Filter Banks for Future Communication Systems Phaselock Techniques Synchronization in Digital Communication Systems Digital Radio System Design Journal of Communications and Networks Proceedings New Modulation and Digital Synchronization Techniques for Higher Capacity Mobile and Personal Communication Systems Digital Communication Receivers, Synchronization, Channel Estimation, and Signal Processing Radiowave Propagation in Satellite Communications Digital Communications and Signal Processing (Second Edition) Chaos-Based Digital Communication Systems A First Course in Digital Communications Baseband Receiver Design for Wireless MIMO-OFDM Communications Introduction to Digital Communications Channel Codes Synchronization Techniques for Digital Receivers Digital Communications Advanced Techniques for Digital Receivers Conference Record Digital Communications 2 Iterative Receiver Design 2000 IEEE International Conference on Acoustics, Speech, and Signal Processing Improved Synchronization and Channel Estimation Methods for Communication System Fundamentals of Digital Communication

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

There have been considerable developments in information and communication technology. This has led to an increase in the number of applications available, as well as an increase in their variability. As such, it has become important to understand and master problems related to establishing radio links, the layout and flow of source data, the power available from antennas, the selectivity and sensitivity of receivers, etc. This book discusses digital modulations, their extensions and environment, as well as a few basic mathematical tools. An understanding of degree level mathematics or its equivalent is a prerequisite to reading this book. Digital Communication Techniques is aimed at licensed professionals, engineers, Master's students and researchers whose field is in related areas such as hardware, phase-locked loops, voltage-controlled oscillators or phase noise.

Today, wireless infrared transmission has entered our homes, offices, industry and health care, with applications in the field of remote control, telemetry, and local communication. This book is about the underlying technology. As it is an outgrowth of my Ph.D. thesis, the emphasis is on fundamental aspects rather than industrial aspects, like the standardization effort by the IrDA [7]. I guess that this is not a drawback, as, eventually, the laws of physics apply to all of us! As the applied radiation is not necessarily in the infrared, throughout the book we usually prefer the term optical transmission. As most equipment is battery-powered, the emphasis is on power optimization of the optical transmission system. System parameters as well as environmental parameters that determine the eventual transmission quality are identified, to facilitate well-reasoned system design. Many design rules, based on calculations, measurements and simulations are presented to help the designer push the performance close to the limits set by nature and the available technology. The first chapters introduce the subject and the present the scope of the book. Then, the basic transmission link is introduced in chapter 3, and strategies to optimize its signal-to-noise ratio are discussed. Lighting flicker is identified as a possible source of interference. Then, receiver noise and bandwidth are discussed in chapter 4, mainly based on the material presented in [66], [67], [69].

A concise introduction to the core concepts in digital communication, providing clarity and depth through examples, problems and MATLAB exercises. Its simple structure maps a logical route to understand the most basic principles in digital communication, and also leads students through more in-depth treatment with examples and step-by-step instructions.

This book, edited and authored by world leading experts, gives a review of the principles, methods and techniques of important and emerging research topics and technologies in wireless communications and transmission techniques. The reader will: Quickly grasp a new area of research Understand the underlying principles of a topic and its application Ascertain how a topic relates to other areas and learn of the research issues yet to be resolved Reviews important and emerging topics of research in wireless technology in a quick tutorial format Presents core principles in wireless transmission theory Provides reference content on core principles, technologies, algorithms, and applications Includes comprehensive references to journal articles and other literature on which to build further, more specific and detailed knowledge

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

Iterative processing is an important technique with numerous applications. Exploiting the power of factor graphs, this detailed survey provides a general framework for systematically developing iterative algorithms for digital receivers, and highlights connections between important algorithms. Starting with basic concepts in digital communications, progressively more complex ideas are presented and integrated resulting in the development of cutting-edge algorithms for iterative receivers. Real-world applications are covered in detail, including decoding for turbo and LDPC codes, and detection for multi-antenna and multi-user systems. This accessible framework will allow the reader to apply factor graphs to practical problems, leading to the design of new algorithms in applications beyond digital receivers. With many examples and algorithms in pseudo-code, this book is an invaluable resource for graduate students and researchers in electrical engineering and computer science, and for practitioners in the communications industry. Additional resources for this title are available online at www.cambridge.org/9780521873154.

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.

Have you ever wanted to know how modern digital communications systems work? Find out with this step-by-step guide to building a complete digital radio that includes every element of a typical, real-world communication system. Chapter by chapter, you will create a MATLAB realization of the various pieces of the system, exploring the key ideas along the way, as well as analyzing and assessing the performance of each component. Then, in the final chapters, you will discover how all the parts fit together and interact as you build the complete receiver. In addition to coverage of crucial issues, such as timing, carrier recovery and equalization, the text contains over 400 practical exercises, providing invaluable preparation for industry, where wireless communications and software radio are becoming increasingly important. A variety of extra resources are also provided online, including lecture slides and a solutions manual for instructors.

A greatly revised and expanded account of phaselock technology The Third Edition of this landmark book presents new developments in the field of phaselock loops, some of which

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have never been published until now. Established concepts are reviewed critically and recommendations are offered for improved formulations. The work reflects the author's own research and many years of hands-on experience with phase-locked loops. Reflecting the myriad of phase-locked loops that are now found in electronic devices such as televisions, computers, radios, and cellphones, the book offers readers much new material, including:

- * Revised and expanded coverage of transfer functions
- * Two chapters on phase noise
- * Two chapters examining digital phase-locked loops
- * A chapter on charge-pump phase-locked loops
- * Expanded discussion of phase detectors and of oscillators
- * A chapter on anomalous phase-locking
- * A chapter on graphical aids, including Bode plots, root locus plots, and Nichols charts

As in the previous editions, the focus of the book is on underlying principles, which remain valid despite technological advances. Extensive references guide readers to additional information to help them explore particular topics in greater depth. Phase-Locked Techniques, Third Edition is intended for practicing engineers, researchers, and graduate students. This critically acclaimed book has been thoroughly updated with new information and expanded for greater depth.

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 communication 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 baseband 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.

Many important GPS applications require a GNSS (global navigation satellite system) receiver with the ability to work with weak signals. This book addresses the critical issue, introducing new, efficient GNSS receiver algorithms designed for weak signals and various dynamic conditions.

This lecture covers the fundamentals of spread spectrum modulation, which can be defined as any modulation technique that requires a transmission bandwidth much greater than the modulating signal bandwidth, independently of the bandwidth of the modulating signal. After reviewing basic digital modulation techniques, the principal forms of spread spectrum modulation are described. One of the most important components of a spread spectrum system is the spreading code, and several types and their characteristics are described. The most essential operation required at the receiver in a spread spectrum system is the code synchronization, which is usually broken down into the operations of acquisition and tracking. Means for performing these operations are discussed next. Finally, the performance of spread spectrum systems is of fundamental interest and the effect of jamming is considered, both without and with the use of forward error correction coding. The presentation ends with consideration of spread spectrum systems in the presence of other users.

Do you need to know how to develop more efficient digital communication systems? Based on the author's experience of over thirty years in industrial design, this practical guide provides detailed coverage of synchronization subsystems and their relationship with other system components. Readers will gain a comprehensive understanding of the techniques needed for the design, performance analysis and implementation of synchronization functions for a range of different modern communication technologies. Specific topics covered include frequency-locked loops in wireless receivers, optimal OFDM timing phase determination and implementation, and interpolation filter design and analysis in digital resamplers. Numerous implementation examples help readers to develop the necessary practical skills, and slides summarizing key concepts accompany the book online. This is an invaluable guide and essential reference for both practicing engineers and graduate students working in digital communications.

"Professor Andreas F. Molisch, renowned researcher and educator, has put together the comprehensive book, Wireless Communications. The second edition, which includes a wealth of new material on important topics, ensures the role of the text as the key resource for every student, researcher, and practitioner in the field." —Professor Moe Win, MIT, USA. Wireless communications has grown rapidly over the past decade from a niche market into one of the most important, fast moving industries. Fully updated to incorporate the latest research and developments, Wireless Communications, Second Edition provides an authoritative overview of the principles and applications of mobile communication technology. The author provides an in-depth analysis of current treatment of the area, addressing both the traditional elements, such as Rayleigh fading, BER in flat fading channels, and equalisation, and more recently emerging topics such as multi-user detection in CDMA systems, MIMO systems, and cognitive radio. The dominant wireless standards; including cellular, cordless and wireless LANs; are discussed. Topics featured include: wireless propagation channels, transceivers and signal processing, multiple access and advanced transceiver schemes, and standardised wireless systems. Combines mathematical descriptions with intuitive explanations of the physical facts, enabling readers to acquire a deep understanding of the subject. Includes new chapters on cognitive radio, cooperative communications and relaying, video coding, 3GPP Long Term Evolution, and WiMax; plus significant new sections on multi-user MIMO, 802.11n, and information theory. Companion website featuring: supplementary material on 'D-ECT', solutions manual and presentation slides for instructors, appendices, list of abbreviations and other useful resources.

A systematic explanation of the principles of radio systems, Digital Radio System Design offers a balanced treatment of both digital transceiver modems and RF front-end subsystems and circuits. It provides an in-depth examination of the complete transceiver chain which helps to connect the two topics in a unified system concept. Although the book tackles such diverse fields it treats them in sufficient depth to give the designer a solid foundation and an implementation perspective. Covering the key concepts and factors that characterise and impact radio transmission and reception, the book presents topics such as receiver design, noise and distortion. Information is provided about more advanced aspects of system design such as implementation losses due to non-idealities. Providing vivid examples, illustrations and detailed case-studies, this book is an ideal introduction to digital radio systems design. Offers a balanced treatment of digital modem and RF front-end design concepts for complete transceivers. Presents a diverse range of topics related to digital radio design including advanced transmission and synchronization techniques with emphasis on implementation. Provides guidance on imperfections and non-idealities in radio system design. Includes detailed design case-studies incorporating measurement and simulation results to illustrate the theory in practice.

Synchronization is a critical function in digital communications; its failures may have catastrophic effects on the transmission system performance. Furthermore, synchronization circuits comprehend such a large part of the receiver hardware that their implementation has a substantial impact on the overall costs. For these reasons design engineers are particularly concerned with the development of new and more efficient synchronization structures. Unfortunately, the advent of digital VLSI technology has radically affected modem design rules, to a point that most analog techniques employed so far have become totally obsolete. Although digital synchronization methods are well established by now in the literature, they only appear in the form of technical papers, often concentrating on specific performance or implementation issues. As a consequence they are hardly useful to give a unified view of an otherwise seemingly heterogeneous field. It is widely recognized that a fundamental understanding of digital synchronization can only be reached by providing the designer with a solid theoretical framework, or else he will not know where to adjust his methods when he attempts to apply them to new situations. The task of the present book is just to develop such a framework.

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Do you need to know how to develop more efficient digital communication systems? Based on the author's experience of over thirty years in industrial design, this practical guide

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provides detailed coverage of synchronization subsystems and their relationship with other system components. Readers will gain a comprehensive understanding of the techniques needed for the design, performance analysis and implementation of synchronization functions for a range of different modern communication technologies. Specific topics covered include frequency-locked loops in wireless receivers, optimal OFDM timing phase determination and implementation, and interpolation filter design and analysis in digital resamplers. Numerous implementation examples help readers to develop the necessary practical skills, and slides summarizing key concepts accompany the book online. This is an invaluable guide and essential reference for both practicing engineers and graduate students working in digital communications.

The Second Edition of OFDM Baseband Receiver Design for Wireless Communications, this book expands on the earlier edition with enhanced coverage of MIMO techniques, additional baseband algorithms, and more IC design examples. The authors cover the full range of OFDM technology, from theories and algorithms to architectures and circuits. The book gives a concise yet comprehensive look at digital communication fundamentals before explaining signal processing algorithms in receivers. The authors give detailed treatment of hardware issues - from architecture to IC implementation. Links OFDM and MIMO theory with hardware implementation Enables the reader to transfer communication received concepts into hardware; design wireless receivers with acceptable implementation loss; achieve low-power designs Covers the latest standards, such as DVB-T2, WiMax, LTE and LTE-A Includes more baseband algorithms, like soft-decoding algorithms such as BCJR and SOVA Expanded treatment of channel models, detection algorithms and MIMO techniques Features concrete design examples of WiMAX systems and cognitive radio applications Companion website with lecture slides for instructors Based on materials developed for a course in digital communication IC design, this book is ideal for graduate students and researchers in VLSI design, wireless communications, and communications signal processing. Practicing engineers working on algorithms or hardware for wireless communications devices will also find this to be a key reference.

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.

Orthogonal Waveforms and Filter Banks for Future Communication Systems provides an up-to-date account of orthogonal filter bank-based multicarrier (FBMC) systems and their applications in modern and future communications, highlighting the crucial role that advanced multicarrier waveforms play. It is an up-to-date overview of the theory, algorithms, design and applications of FBMC systems at both the link- and system levels that demonstrates the various gains offered by FBMC over existing transmission schemes via both simulation and test bed experiments. Readers will learn the requirements and challenges of advanced waveform design for future communication systems, existing FBMC approaches, application areas, and their implementation. In addition, the state-of-the-art in PHY- and MAC-layer solutions based on FBMC techniques, including theoretical, algorithmic and implementation aspects are explored. Presents a unique and up-to-date source for signal processing/communications researchers and practitioners Presents a homogeneous, comprehensive presentation of the subject Covers offset-QAM based FBMC (FBMC/OQAM) and its variants, including its history, signal processing interest and potential for maximum spectral efficiency, among other features

Radiowave Propagation in Communications was written with two basic objectives: (1) to present an up-to-date review of the major radiowave propagation phenomena which hinder reliable space communications, and (2) to describe how these propagation phenomena affect the design and performance of satellite communications systems. Earth-orbiting satellites are employed extensively for the relay of information in a vast array of telecommunications, meteorological, government, and scientific applications. Satellite systems rely on the transmission of radiowaves to and from the satellite and are dependent on the propagation characteristics of the transmission path, primarily the earth's atmosphere. Radiowave propagation thus plays a very important part in the design and ultimate performance of space communications systems. This book presents, for the first time, the meshing in a single publication of the fundamentals of radiowave propagation factors with a discussion of the practical consequences of these factors on satellite communications systems. Two major subfields are involved in this book. Radiowave propagation, which is basically applied electromagnetic theory, provides the theory and analytical tools for the first several chapters. Later chapters then apply propagation effects to the field of electrical engineering involved with satellite communications. The material progresses from the essential aspects of radiowave propagation to the application of practical methods and techniques in the design and performance of satellite communications systems.

This second volume covers the following blocks in the chain of communication: the modulation baseband and transposed band, synchronization and channel estimation as well as detection. Variants of these blocks, the multicarrier modulation and coded modulations are used in current systems or future.

Digital Communication Receivers Synchronization, Channel Estimation, and Signal Processing Digital Communication Receivers offers a complete treatment on the theoretical and practical aspects of synchronization and channel estimation from the standpoint of digital signal processing. The focus on these increasingly important topics, the systematic approach to algorithm development, and the linked algorithm-architecture methodology in digital receiver design are unique features of this book. The material is structured according to different classes of transmission channels. In Part C, baseband transmission over wire or optical fiber is addressed. Part D covers passband transmission over satellite or terrestrial wireless channels. Part E deals with transmission over fading channels. Designed for the practicing communication engineer and the graduate student, the book places considerable emphasis on helpful examples, summaries, illustrations, and bibliographies. Contents include: * Basic material * Baseband communications * Passband transmission * Receiver structure for PAM signals * Synthesis of synchronization algorithms * Performance analysis of synchronizers * Bit error degradation caused by random tracking errors * Frequency estimation * Timing adjustment by interpolation * DSP system implementation * Characterization, modeling, and simulation of linear fading channels * Detection and parameter synchronization on fading channels * Receiver structures for fading channels * Parameter synchronization for flat fading channels * Parameter synchronization for selective fading channels

Channel coding lies at the heart of digital communication and data storage, and this detailed introduction describes the core theory as well as decoding algorithms, implementation details, and performance analyses. In this book, Professors Ryan and Lin provide clear information on modern channel codes, including turbo and low-density parity-check (LDPC) codes. They also present detailed coverage of BCH codes, Reed-Solomon codes, convolutional codes, finite geometry codes, and product codes, providing a one-stop resource for both classical and modern coding techniques. Assuming no prior knowledge in the field of channel coding, the opening chapters begin with basic theory to introduce newcomers to the subject. Later chapters then extend to advanced topics such as code ensemble performance analyses and algebraic code design. 250 varied and stimulating end-of-chapter problems are also included to test and enhance learning, making this an essential resource for students and practitioners alike.

Wireless Receiver Architectures and Design presents the various designs and architectures of wireless receivers in the context of modern multi-mode and multi-standard devices. This one-stop reference and guide to designing low-cost low-power multi-mode, multi-standard receivers treats analog and digital signal processing simultaneously, with equal detail given to the chosen architecture and modulating waveform. It provides a complete understanding of the receiver's analog front end and the digital backend, and how each affects the other. The book explains the design process in great detail, starting from an analysis of requirements to the choice of architecture and finally to the design and algorithm development. The advantages and disadvantages of each wireless architecture and the suitability to a standard are given, enabling a better choice of design methodology, receiver lineup, analog block, and digital algorithm for a particular architecture. Whether you are a communications engineer working in system architecture and waveform design, an RF engineer working on noise and linearity budget and line-up analysis, a DSP engineer working on algorithm development, or an analog or digital design engineer designing circuits for wireless transceivers, this book is your one-stop reference and guide to designing low-cost low-power multi-mode multi-standard receivers. The material in this book is organized and presented to lead you from applied theory to practical design with plenty of examples and case studies drawn from modern wireless standards. Provides a complete description of receiver architectures together with their pros and cons, enabling a better choice of design methodology Covers the design trade-offs and algorithms between the analog front end and the digital modem – enabling an end-to-end design approach Addresses multi-mode multi-standard low-cost, low-power radio design – critical for producing the applications for Smart phones and portable internet devices

Based on the popular Artech House classic, Digital Communication Systems Engineering with Software-Defined Radio, this book provides a practical approach to quickly learning the software-defined radio (SDR) concepts needed for work in the field. This up-to-date volume guides readers on how to quickly prototype wireless designs using SDR for real-world testing and experimentation. This book explores advanced wireless communication techniques such as OFDM, LTE, WLA, and hardware targeting. Readers will gain an understanding of the core concepts behind wireless hardware, such as the radio frequency front-end, analog-to-digital and digital-to-analog converters, as well as various processing technologies. Moreover, this volume includes chapters on timing estimation, matched filtering, frame synchronization message decoding, and source coding. The orthogonal frequency division multiplexing is explained and details about HDL code generation and deployment are provided. The book concludes with coverage of the WLAN toolbox with OFDM beacon reception and the LTE toolbox with downlink reception. Multiple case studies are provided throughout the book. Both MATLAB and Simulink source code are included to assist readers with their projects in the field.

Disk contains: MATLAB/SIMULINK programs to be used for the problem exercises.