

Error Control Coding For Data Networks

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Error Control Coding - Peter Sweeney 2002-04-29

Error-controlled coding techniques are used to detect and/or correct errors that occur in the message transmission in a digital communications system. Wireless personal channels used by mobile communications systems and storage systems for digital multimedia data all require the implementation of error control coding methods. Demonstrating the role of coding in communication and data storage system design, this text illustrates the correct use of codes and the selection of the right code parameters. Relevant decoding techniques and their implementation are discussed in detail. Providing communication systems engineers and students with guidance in the application of error-control coding, this book emphasizes the fundamental concepts of coding theory while minimising the use of mathematical tools. * Reader-friendly approach to coding in communication systems providing examples of encoding and decoding, information theory and criteria for code selection * Thorough descriptions of relevant application, including telephony on satellite links, GSM, UMTS and multimedia standards, CD, DVD and MPEG * Provides coverage of the fundamentals of coding and the applications of codes to the design of real error control systems * End of chapter problems to test and develop understanding

Essentials of Error-Control Coding - Jorge Castiñeira Moreira 2006-08-04

Rapid advances in electronic and optical technology have enabled the implementation of powerful error-control codes, which are now used in almost the entire range of information systems with close to optimal performance. These codes and decoding methods are required for the detection and correction of the errors and erasures which inevitably occur in digital information during transmission, storage and processing because of noise, interference and other imperfections. Error-control coding is a complex, novel and unfamiliar area, not yet widely understood and appreciated. This book sets out to provide a clear description of the essentials of the subject, with comprehensive and up-to-date coverage of the most useful codes and their decoding algorithms. A practical engineering and information technology emphasis, as well as relevant background material and fundamental theoretical aspects, provides an in-depth guide to the essentials of Error-Control Coding. Provides extensive and detailed coverage of Block, Cyclic, BCH, Reed-Solomon, Convolutional, Turbo, and Low Density Parity Check (LDPC) codes, together with relevant aspects of Information Theory EXIT chart performance analysis for iteratively decoded error-control techniques Heavily illustrated with tables, diagrams, graphs, worked examples, and exercises Invaluable companion website features slides of figures, algorithm software, updates and solutions to problems Offering a complete overview of Error Control Coding, this book is an indispensable resource for students, engineers and researchers in the areas of telecommunications engineering, communication networks, electronic engineering, computer science, information systems and technology, digital signal processing and applied mathematics.

Linear Network Error Correction Coding - Xuan Guang 2014-03-21

There are two main approaches in the theory of network error correction coding. In this SpringerBrief, the authors summarize some of the most important contributions following the classic approach, which represents messages by sequences similar to algebraic coding, and also briefly discuss the main results following the other approach, that uses the theory of rank metric codes for network error correction of representing messages by subspaces. This book starts by establishing the basic linear network error correction (LNEC) model and then characterizes two equivalent descriptions. Distances and weights are

defined in order to characterize the discrepancy of these two vectors and to measure the seriousness of errors. Similar to classical error-correcting codes, the authors also apply the minimum distance decoding principle to LNEC codes at each sink node, but use distinct distances. For this decoding principle, it is shown that the minimum distance of a LNEC code at each sink node can fully characterize its error-detecting, error-correcting and erasure-error-correcting capabilities with respect to the sink node. In addition, some important and useful coding bounds in classical coding theory are generalized to linear network error correction coding, including the Hamming bound, the Gilbert-Varshamov bound and the Singleton bound. Several constructive algorithms of LNEC codes are presented, particularly for LNEC MDS codes, along with an analysis of their performance. Random linear network error correction coding is feasible for noncoherent networks with errors. Its performance is investigated by estimating upper bounds on some failure probabilities by analyzing the information transmission and error correction. Finally, the basic theory of subspace codes is introduced including the encoding and decoding principle as well as the channel model, the bounds on subspace codes, code construction and decoding algorithms.

Transporting Compressed Digital Video - Xuemin Chen 2006-04-18

The purpose of Transporting Compressed Digital Video is to introduce fundamental principles and important technologies used in design and analysis of video transport systems for many video applications in digital networks. In the past two decades, progress in digital video processing, transmission, and storage technologies, such as video compression, digital modulation, and digital storage disk, has proceeded at an astounding pace. Digital video compression is a field in which fundamental technologies were motivated and driven by practical applications so that they often lead to many useful advances. Especially, the digital video-compression standards, developed by the Moving Pictures Expert Group (MPEG) of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), have enabled many successful digital-video applications. These applications range from digital-video disk (DVD) and multimedia CDs on a desktop computer, interactive digital cable television, to digital satellite networks. MPEG has become the most recognized standard for digital video compression. MPEG video is now an integral part of most digital video transmission and storage systems. Nowadays, video compression technologies are being used in almost all modern digital video systems and networks. Not only is video compression equipment being implemented to increase the bandwidth efficiency of communication systems, but video compression also provides innovative solutions to many related video-networking problems. The subject of Transporting Compressed Digital Video includes several important topics, in particular video buffering, packet scheduling, multiplexing and synchronization.

UPSC IAS SYLLABUS CSE GS MAINS PRELIMS MICRO TOPICS ADVANCE STUDY BOOK - BEERAM SURYA CHANDRA 2019-10-02

To benefit Upsc aspirants throughout India, Smart Upsc Ias Syllabus Tracker 2020 has come up with its official App through which its expert guidance and Syllabus, Tasks, Eligibility, cutoff of Upsc Exam can be accessed by student's on their phones from every nook and corner of India. ALL UPSC PREPARATION FOR IAS IFS IPS IRS GS PRELIMS MAINS OPTIONAL UPSC SYLLABUS TRACKER GUIDE QUIZ PREVIOUS YEARS UNSTOPPABLE UPSC APP ENGLISH AND HINDI 2020 2021 2022 Upsc Syllabus Trening Ebook 2020. Key Main features of Our UPSC IAS CSE SYLLABUS BOOK 2020 □ Upsc □ Ias Books And Syllabus 2020 □ Upsc Ias □ Upsc Ias Syllabus in English (Hindi Upcoming) □ Upsc Prelims Syllabus in

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Coding for Data and Computer Communications - David Salomon 2006-02-28

Details the most important techniques used to make the storage and transmission of data fast, secure, and reliable. Accessible to both specialists and nonspecialists: Avoids complex mathematics

Fundamentals of Electro-Optic Systems Design - Sherman Karp 2013

Presents practical electro-optical applications in the context of the fundamental principles of communication theory, thermodynamics, information theory and propagation theory. Combining systems issues with fundamentals of communications, this is an essential reference for all practising engineers and academic researchers in optical engineering.

Error Control Coding - Lin Shu 2011

Error Correcting Coding and Security for Data Networks - Grigorii Kabatiansky 2005-10-31

Error correcting coding is often analyzed in terms of its application to the separate levels within the data network in isolation from each other. In this fresh approach, the authors consider the data network as a superchannel (a multi-layered entity) which allows error correcting coding to be evaluated as it is applied to a number of network layers as a whole. By exposing the problems of applying error correcting coding in data networks, and by discussing coding theory and its applications, this original technique shows how to correct errors in the network through joint coding at different network layers. Discusses the problem of reconciling coding applied to different layers using a superchannel approach Includes thorough coverage of all the key codes: linear block codes, Hamming, BCH and Reed-Solomon codes, LDPC codes decoding, as well as convolutional, turbo and iterative coding Considers new areas of application of error correcting codes such as transport coding, code-based cryptosystems and coding for image compression Demonstrates how to use error correcting coding to control such important data characteristics as mean message delay Provides theoretical explanations backed up by numerous real-world examples and practical recommendations Features a companion website containing additional research results including new constructions of LDPC codes, joint error-control coding and synchronization, Reed-Muller codes and their list decoding By progressing from theory through to practical problem solving, this resource contains invaluable advice for researchers, postgraduate students, engineers and computer scientists interested in data communications and applications of coding theory.

Coding Theory - Sudhakar Radhakrishnan 2020-03-11

This book is intended to attract the attention of practitioners and researchers in academia and industry interested in challenging paradigms of coding theory and computer vision. The chapters in this comprehensive reference explore the latest developments, methods, approaches, and applications of coding theory in a wide variety of fields and endeavours. This book is compiled with a view to provide researchers, academicians, and readers with an in-depth discussion of the latest advances in this field. It consists of twelve chapters from academicians, practitioners, and researchers from different disciplines of life. All the chapters are authored by various researchers around the world covering the field of coding theory and image and video processing. This book mainly focusses on researchers who can do quality research in the area of coding theory and image and video processing and related fields. Each chapter is an independent research study, which will motivate young researchers to think about. These twelve chapters are presented in three sections and will be an eye-opener for all who systematic researchers in these fields.

Wireless Communications - Giorgio Viterbo 2013-03-29

This book introduces the theoretical elements at the basis of various classes of algorithms commonly employed in the physical layer (and, in part, in MAC layer) of wireless communication systems. It focuses on single user systems, so ignoring multiple access techniques. Moreover, emphasis is put on single-input single-output (SISO) systems, although some relevant topics about multiple-input multiple-output (MIMO) systems are also illustrated. Comprehensive wireless specific guide to algorithmic techniques Provides a detailed analysis of channel equalization and channel coding for wireless applications Unique conceptual approach focusing in single user systems Covers algebraic decoding, modulation techniques, channel coding and channel equalisation

Trellis and Turbo Coding - Christian B. Schlegel 2015-08-12

This new edition has been extensively revised to reflect the progress in error control coding over the past

few years. Over 60% of the material has been completely reworked, and 30% of the material is original. Convolutional, turbo, and low density parity-check (LDPC) coding and polar codes in a unified framework Advanced research-related developments such as spatial coupling A focus on algorithmic and implementation aspects of error control coding

Error-Control Coding for Data Networks - Irving S. Reed 1999-05-31

The purpose of Error-Control Coding for Data Networks is to provide an accessible and comprehensive overview of the fundamental techniques and practical applications of the error-control coding needed by students and engineers. An additional purpose of the book is to acquaint the reader with the analytical techniques used to design an error-control coding system for many new applications in data networks. Error-control coding is a field in which elegant theory was motivated by practical problems so that it often leads to important useful advances. Claude Shannon in 1948 proved the existence of error-control codes that, under suitable conditions and at rates less than channel capacity, would transmit error-free information for all practical applications. The first practical binary codes were introduced by Richard Hamming and Marcel Golay from which the drama and excitement have infused researchers and engineers in digital communication and error-control coding for more than fifty years. Nowadays, error-control codes are being used in almost all modern digital electronic systems and data networks. Not only is coding equipment being implemented to increase the energy and bandwidth efficiency of communication systems, but coding also provides innovative solutions to many related data-networking problems.

Error-Control Coding for Data Networks - Irving S. Reed 2012-12-06

The purpose of Error-Control Coding for Data Networks is to provide an accessible and comprehensive overview of the fundamental techniques and practical applications of the error-control coding needed by students and engineers. An additional purpose of the book is to acquaint the reader with the analytical techniques used to design an error-control coding system for many new applications in data networks. Error-control coding is a field in which elegant theory was motivated by practical problems so that it often leads to important useful advances. Claude Shannon in 1948 proved the existence of error-control codes that, under suitable conditions and at rates less than channel capacity, would transmit error-free information for all practical applications. The first practical binary codes were introduced by Richard Hamming and Marcel Golay from which the drama and excitement have infused researchers and engineers in digital communication and error-control coding for more than fifty years. Nowadays, error-control codes are being used in almost all modern digital electronic systems and data networks. Not only is coding equipment being implemented to increase the energy and bandwidth efficiency of communication systems, but coding also provides innovative solutions to many related data-networking problems.

Error-correcting Coding Theory - Man Young Rhee 1989

A Practical Guide to Error-Control Coding Using MATLAB - Yuan Jiang 2010

This practical resource provides you with a comprehensive understanding of error control coding, an essential and widely applied area in modern digital communications. The goal of error control coding is to encode information in such a way that even if the channel (or storage medium) introduces errors, the receiver can correct the errors and recover the original transmitted information. This book includes the most useful modern and classic codes, including block, Reed Solomon, convolutional, turbo, and LDPC codes. You find clear guidance on code construction, decoding algorithms, and error correcting performances. Moreover, this unique book introduces computer simulations integrally to help you master key concepts. Including a companion DVD with MATLAB programs and supported with over 540 equations, this hands-on reference provides you with an in-depth treatment of a wide range of practical implementation issues.

Advanced Error Control Techniques for Data Storage Systems - Erozan M. Kurtas 2018-10-03

With the massive amount of data produced and stored each year, reliable storage and retrieval of information is more crucial than ever. Robust coding and decoding techniques are critical for correcting errors and maintaining data integrity. Comprising chapters thoughtfully selected from the highly popular Coding and Signal Processing for Magnetic Recording Systems, Advanced Error Control Techniques for Data Storage Systems is a finely focused reference to the state-of-the-art error control and modulation

techniques used in storage devices. The book begins with an introduction to error control codes, explaining the theory and basic concepts underlying the codes. Building on these concepts, the discussion turns to modulation codes, paying special attention to run-length limited sequences, followed by maximum transition run (MTR) and spectrum shaping codes. It examines the relationship between constrained codes and error control and correction systems from both code-design and architectural perspectives as well as techniques based on convolution codes. With a focus on increasing data density, the book also explores multi-track systems, soft decision decoding, and iteratively decodable codes such as Low-Density Parity-Check (LDPC) Codes, Turbo codes, and Turbo Product Codes. Advanced Error Control Techniques for Data Storage Systems offers a comprehensive collection of theory and techniques that is ideal for specialists working in the field of data storage systems.

Fundamentals of Mobile Data Networks - Guowang Miao 2016-03-03

This unique text provides a comprehensive and systematic introduction to the theory and practice of mobile data networks. Covering basic design principles as well as analytical tools for network performance evaluation, and with a focus on system-level resource management, you will learn how state-of-the-art network design can enable you flexibly and efficiently to manage and trade-off various resources such as spectrum, energy, and infrastructure investments. Topics covered range from traditional elements such as medium access, cell deployment, capacity, handover, and interference management, to more recent cutting-edge topics such as heterogeneous networks, energy and cost-efficient network design, and a detailed introduction to LTE (4G). Numerous worked examples and exercises illustrate the key theoretical concepts and help you put your knowledge into practice, making this an essential resource whether you are a student, researcher, or practicing engineer.

Introduction to Convolutional Codes with Applications - Ajay Dholakia 2012-12-06

Introduction to Convolutional Codes with Applications is an introduction to the basic concepts of convolutional codes, their structure and classification, various error correction and decoding techniques for convolutionally encoded data, and some of the most common applications. The definition and representations, distance properties, and important classes of convolutional codes are also discussed in detail. The book provides the first comprehensive description of table-driven correction and decoding of convolutionally encoded data. Complete examples of Viterbi, sequential, and majority-logic decoding technique are also included, allowing a quick comparison among the different decoding approaches. Introduction to Convolutional Codes with Applications summarizes the research of the last two decades on applications of convolutional codes in hybrid ARQ protocols. A new classification allows a natural way of studying the underlying concepts of hybrid schemes and accommodates all of the new research. A novel application of fast decodable invertible convolutional codes for lost packet recovery in high speed networks is described. This opens the door for using convolutional coding for error recovery in high speed networks. Practicing communications, electronics, and networking engineers who want to get a better grasp of the underlying concepts of convolutional coding and its applications will greatly benefit by the simple and concise style of explanation. An up-to-date bibliography of over 300 papers is included. Also suitable for use as a textbook or a reference text in an advanced course on coding theory with emphasis on convolutional codes.

UPSC IAS EXAM PLANNER 2019-2020 -

IAS Planner 2019-2020 : Civil Services Examination planner is a comprehensive book for candidates preparing for the Civil Services Examinations conducted by UPSC. The book provides detailed information on the preparation strategy and exam syllabus. This book will help the students plan their studies better for the examination. This book is essential for students aspiring to work for the Indian Administrative Services (IAS), IPS, IFS, Grade-A Services. Table of Contents: Getting Started For Civil Services Examination. Preparing For Civil Services Without Coaching . Preparing For Civil Services Preliminary Examination. Civil Services Examination (CSE) . The Hindu Newspaper: How and what to Study In It . 9 Step Strategy to Prepare For the UPSC Interview . Importance Of Economic Survey For UPSC Exams . Importance Of Yojana, Kurukshetra Magazine For UPSC Exams. (Article) Crack IAS Preliminary In your First attempt . Civil Services: What, Why and How? . Importance Of Ncert Books For UPSC Exams (Why, What, How) . How to Read a Newspaper For IAS Exam . What are the Important topics to Read From a

Newspaper In two Hours? How Should One Start IAS Exam Preparation From Scratch ? . Howto Study ?The Ultimate Dilemma. Preparing For Civil Services Without Coaching . IAS Preparation For Rural/Remote areas Students . All about the Online test Series: Why Should I Take It?. Ncert and Nios Books For IAS Preparations . Civil Services Preparation For working Professionals Overview Of UPSC Personality Test (IAS Interview) . Preparing For Civil Services Preliminary Examination Syllabus For Civil Services Preliminary And Mains Examination . Profiles Of Services Participating In Civil Services . IAS Exam Practice Paper . Tags: UPSC, IAS, IPS, IFS, CSAT, Civil Services, UPSC PORTAL, Civil Seva, Union Public Service Commission.

Objective Electrical, Electronic and Telecommunication Engineering - Theraja B.L. & Pandey V.K. 2009

A Textbook on Electrical Technology

Optical Wireless Communications - Z. Ghassemlooy 2019-04-30

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

Error-Correction Coding for Digital Communications - George C. Clark Jr. 2013-06-29

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.

Non-Binary Error Control Coding for Wireless Communication and Data Storage - Rolando Antonio Carrasco 2008-11-20

Comprehensive introduction to non-binary error-correction coding techniques *Non-Binary Error Control Coding for Wireless Communication and Data Storage* explores non-binary coding schemes that have been developed to provide an alternative to the Reed - Solomon codes, which are expected to become unsuitable for use in future data storage and communication devices as the demand for higher data rates increases. This book will look at the other significant non-binary coding schemes, including non-binary block and ring

trellis-coded modulation (TCM) codes that perform well in fading conditions without any expansion in bandwidth use, and algebraic-geometric codes which are an extension of Reed-Solomon codes but with better parameters. Key Features: Comprehensive and self-contained reference to non-binary error control coding starting from binary codes and progressing up to the latest non-binary codes Explains the design and construction of good non-binary codes with descriptions of efficient non-binary decoding algorithms with applications for wireless communication and high-density data storage Discusses the application to specific cellular and wireless channels, and also magnetic storage channels that model the reading of data from the magnetic disc of a hard drive. Includes detailed worked examples for each coding scheme to supplement the concepts described in this book Focuses on the encoding, decoding and performance of both block and convolutional non-binary codes, and covers the Kötter-Vardy algorithm and Non-binary LDPC codes This book will be an excellent reference for researchers in the wireless communication and data storage communities, as well as development/research engineers in telecoms and storage companies. Postgraduate students in these fields will also find this book of interest.

Digital Video Transcoding for Transmission and Storage - Huifang Sun 2018-10-03

Professionals in the video and multimedia industries need a book that explains industry standards for video coding and how to convert the compressed information between standards. *Digital Video Transcoding for Transmission and Storage* answers this demand while also supplying the theories and principles of video compression and transcoding technologies. Emphasizing digital video transcoding techniques, this book summarizes its content via examples of practical methods for transcoder implementation. It relates almost all of its featured transcoding technologies to practical applications. This volume takes a structured approach, starting with basic video transcoding concepts and progressing toward the most sophisticated systems. It summarizes material from research papers, lectures, and presentations. Organized into four parts, the text first provides the background of video coding theory, principles of video transmission, and video coding standards. The second part includes three chapters that explain the theory of video transcoding and practical problems. The third part explores buffer management, packet scheduling, and encryption in the transcoding. The book concludes by describing the application of transcoding, universal multimedia access with the emerging MPEG-21 standard, and the end-to-end test bed.

Public Data Networks - Josef Puzman 2012-12-06

Public Data Networks provide a comprehensive survey of PDNs, covering all major countries. PDNs allow efficient and cost-effective telecommunication between a terminal and computer, or between computers, regardless of who owns the data terminal. The authors discuss the current state of, and forthcoming developments in, data communications using public telecommunication facilities. Apart from the classical telecommunication networks (telegraph and telephone), public data networks provide the majority of data communication services worldwide. The range of data services and user facilities has gradually expanded, the quality of services improved, and new services have appeared (e.g. datafax, teletex, videotex, message handling and teleconferencing). The authors concentrate on PDN principles, taking account of the latest CCITT recommendations and ISO standards. Appendices and references provide detailed information for those working on PDNs at research, design and implementation level. Network digitalization and integration of networks and services have aided progress towards the integrated services digital network (ISDN). The ISDN uses advanced transmission and switching techniques to enhance the telecommunication services provided to its users. An ISDN has much in common with the PDN as far as architecture, methods of network management and functions are concerned, but there are distinct differences in the methods of access and signalling. The authors have extensive experience in data communication networking. Dr. Kubin is vice-chairman of Study Group IX of the International Telegraph and Telephone Consultative Committee (CCITT); Dr. Puzman is the Czechoslovak representative at Technical Commission 6 (TC-6) of the International Federation for Information Processing (IFIP). *Public Data Networks* is essential reading for researchers and designers of PDNs, in universities and industry, and provides important reference material for telecommunications and computer science students.

Wireless and Mobile Data Networks - Aftab Ahmad 2005-08-08

Wireless and Mobile Data Networks provides a single point of knowledge about wireless data technologies, including: * Comprehensive easy-to-understand resource on wireless data technologies * Includes wireless

media, data transmission via cellular networks, and network security * Provides a single point of knowledge about wireless data * Focuses on wireless data networks, wireless channels, wireless local networks, wide area cellular networks and wireless network security An Instructor Support FTP site is available from the Wiley editorial department.

Error Correction Coding - Todd K. Moon 2005-06-06

An unparalleled learning tool and guide to error correction coding Error correction coding techniques allow the detection and correction of errors occurring during the transmission of data in digital communication systems. These techniques are nearly universally employed in modern communication systems, and are thus an important component of the modern information economy. Error Correction Coding: Mathematical Methods and Algorithms provides a comprehensive introduction to both the theoretical and practical aspects of error correction coding, with a presentation suitable for a wide variety of audiences, including graduate students in electrical engineering, mathematics, or computer science. The pedagogy is arranged so that the mathematical concepts are presented incrementally, followed immediately by applications to coding. A large number of exercises expand and deepen students' understanding. A unique feature of the book is a set of programming laboratories, supplemented with over 250 programs and functions on an associated Web site, which provides hands-on experience and a better understanding of the material. These laboratories lead students through the implementation and evaluation of Hamming codes, CRC codes, BCH and R-S codes, convolutional codes, turbo codes, and LDPC codes. This text offers both "classical" coding theory—such as Hamming, BCH, Reed-Solomon, Reed-Muller, and convolutional codes—as well as modern codes and decoding methods, including turbo codes, LDPC codes, repeat-accumulate codes, space-time codes, factor graphs, soft-decision decoding, Guruswami-Sudan decoding, EXIT charts, and iterative decoding. Theoretical complements on performance and bounds are presented. Coding is also put into its communications and information theoretic context and connections are drawn to public key cryptosystems. Ideal as a classroom resource and a professional reference, this thorough guide will benefit electrical and computer engineers, mathematicians, students, researchers, and scientists.

Wireless Multimedia Network Technologies - Rajamani Ganesh 2006-04-18

This book is a collection of invited papers that were presented at the Ninth IEEE International Symposium on Personal, Indoor and Mobile Radio Communications, September 5-8, 1998, Boston, MA. These papers are meant to provide a global view of the emerging third-generation wireless networks in the wake of the third millennium. Following the tradition of the PIMRC conferences, the papers are selected to strike a balance between the diverse interests of academia and industry by addressing issues of interest to the designers, manufacturers, and service providers involved in the wireless networking industry. The tradition of publishing a collection of the invited papers presented at the PIMRC started in PIMRC'97, Helsinki, Finland. There are two benefits to this tradition (1) it provides a shorter version of the proceedings of the conference that is more focused on a specific theme (2) the papers are comprehensive and are subject of a more careful review process to improve the contents as well as the presentation of the material, making it more appealing for archival as a reference book. The production costs of the book is subsidized by the conference and the editors have donated the royalty income of the book to the conference.

Wireless Sensor Networks - Ian F. Akyildiz 2010-06-10

This book presents an in-depth study on the recent advances in Wireless Sensor Networks (WSNs). The authors describe the existing WSN applications and discuss the research efforts being undertaken in this field. Theoretical analysis and factors influencing protocol design are also highlighted. The authors explore state-of-the-art protocols for WSN protocol stack in transport, routing, data link, and physical layers. Moreover, the synchronization and localization problems in WSNs are investigated along with existing solutions. Furthermore, cross-layer solutions are described. Finally, developing areas of WSNs including sensor-actor networks, multimedia sensor networks, and WSN applications in underwater and underground environments are explored. The book is written in an accessible, textbook style, and includes problems and solutions to assist learning. Key Features: The ultimate guide to recent advances and research into WSNs Discusses the most important problems and issues that arise when programming and designing WSN systems Shows why the unique features of WSNs – self-organization, cooperation, correlation – will enable new applications that will provide the end user with intelligence and a better understanding of the

environment Provides an overview of the existing evaluation approaches for WSNs including physical testbeds and software simulation environments Includes examples and learning exercises with a solutions manual; supplemented by an accompanying website containing PPT-slides. Wireless Sensor Networks is an essential textbook for advanced students on courses in wireless communications, networking and computer science. It will also be of interest to researchers, system and chip designers, network planners, technical managers and other professionals in these fields.

Optical Fiber Telecommunications IV-B - Ivan P. Kaminow 2002-05-22

Volume B is devoted to light wave systems and system impairments and compensation. Some of the topics include growth of the Internet, network architecture, undersea systems, high speed TDM transmission, cable TV systems, access networks, simulation tools, nonlinear effects, polarization mode dispersion, bandwidth formats, and more. This book is an excellent companion to Optical Fiber Telecommunications IVA: Components (March 2002, ISBN: 0-12-395172-0). Fourth in a respected and comprehensive series - Authoritative authors from a range of organizations - Suitable for active lightwave R&D designers, developers, purchasers, operators, students, and analysts - Lightwave components reviewed in Volume A - Lightwave systems and impairments reviewed in Volume B - Up-to-the minute coverage

Network Coding - Tracey Ho 2008-04-14

Network coding promises to significantly impact the way communications networks are designed, operated, and understood. This book presents a unified and intuitive overview of the theory, applications, challenges, and future directions of this emerging field, and is a must-have resource for those working in wireline or wireless networking. • Uses an engineering approach - explains the ideas and practical techniques • Covers mathematical underpinnings, practical algorithms, code selection, security, and network management • Discusses key topics of inter-session (non-multicast) network coding, lossy networks, lossless networks, and subgraph-selection algorithms Starting with basic concepts, models, and theory, then covering a core subset of results with full proofs, Ho and Lun provide an authoritative introduction to network coding that supplies both the background to support research and the practical considerations for designing coded networks. This is an essential resource for graduate students and researchers in electronic and computer engineering and for practitioners in the communications industry.

Designing 2D and 3D Network-on-Chip Architectures - Konstantinos Tatas 2013-10-08

This book covers key concepts in the design of 2D and 3D Network-on-Chip interconnect. It highlights design challenges and discusses fundamentals of NoC technology, including architectures, algorithms and tools. Coverage focuses on topology exploration for both 2D and 3D NoCs, routing algorithms, NoC router design, NoC-based system integration, verification and testing, and NoC reliability. Case studies are used to illuminate new design methodologies.

UPSC Civil Services (IAS) Syllabus 2016 (Pre & Mains Exam) - Editorial Board

UPSC Civil Services (IAS) Syllabus 2016 (Pre & Mains Exam) 2016 - IAS PRE (CSAT) Syllabus - IAS MAINS SYLLABUS Tags: UPSC, IAS, IPS, IFS, CSAT, Civil Services, UPSC PORTAL, Civil Seva, Union Public Service Commission,

Management Information And Optoelectronic Engineering - Proceedings Of The 2016

International Conference - Gao Yongsheng 2017-03-14

This proceedings brings together 59 selected articles presented at the joint conferences of the International Conference on Management, Information and Communication (ICMIC2016) and the International Conference on Optics and Electronics Engineering (ICOEE2016), which were held in Guilin, China, during May 28-29, 2016. ICMIC2016 and ICOEE2016 provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their latest findings and results in the development in Information Management, Communication, Optics and Electronics host by ICMIC2016 and ICOEE2016. The proceedings collected the latest research results and applications in the related areas. We hope to enlighten readers with some latest developments in Information Management, and Optics Electronics presented at the joint conferences.

Understanding Error Control Coding - Emilio Sanvicente 2019-04-10

This book is addressed to newcomers to error control coding (ECC), making the subject easy to understand and to apply in a variety of cases. The book begins by presenting in a detailed, step-by-step manner the

plethora of parts an ECC system has and the way they interact to achieve the performance required. Contrary to the more abstract and formal approach followed in most books on this topic, this book is unique in that all of the concepts, methods, techniques and algorithms are introduced by way of examples. Thus, the book is almost a workbook, and therefore very suitable for self-study. Readers are encouraged to take an active role while reading, performing calculations as chapters' progress. Moreover, to reinforce the learning process, many of the topics introduced in the book (Galois fields, Extended Hamming codes, Reed-Solomon codes, interleaving, erasure correction, etc.) are presented in various parts of the book in different ways or contexts. Offers a practical guide to error control coding, accessible to readers with varying backgrounds; Provides newcomers with a sound foundation in error control coding, using a select few topics considered by the author fundamental from an engineering point of view; Presents material with minimal mathematics; Motivates carefully concepts, methods and algorithms making clear the idea behind the conditions for the code to work.

Recent Advances in Computer Science and Information Engineering - Zhihong Qian 2012-02-10

CSIE 2011 is an international scientific Congress for distinguished scholars engaged in scientific, engineering and technological research, dedicated to build a platform for exploring and discussing the future of Computer Science and Information Engineering with existing and potential application scenarios. The congress has been held twice, in Los Angeles, USA for the first and in Changchun, China for the second time, each of which attracted a large number of researchers from all over the world. The congress turns out to develop a spirit of cooperation that leads to new friendship for addressing a wide variety of ongoing problems in this vibrant area of technology and fostering more collaboration over the world. The congress,

CSIE 2011, received 2483 full paper and abstract submissions from 27 countries and regions over the world. Through a rigorous peer review process, all submissions were refereed based on their quality of content, level of innovation, significance, originality and legibility. 688 papers have been accepted for the international congress proceedings ultimately.

Codes for Error Detection -

Fundamentals of Mobile Data Networks - Guowang Miao 2016-03-03

Learn the fundamentals of efficient design and management of state-of-the-art mobile data networks with this unique and comprehensive text.

Data Communication Principles - Aftab Ahmad 2007-05-08

Data Communication Principles for Fixed and Wireless Networks focuses on the physical and data link layers. Included are examples that apply to a diversified range of higher level protocols such as TCP/IP, OSI and packet based wireless networks. Performance modeling is introduced for beginners requiring basic mathematics. Separate discussion has been included on wireless cellular networks performance and on the simulation of networks. Throughout the book, wireless LANs has been given the same level of treatment as fixed network protocols. It is assumed that readers would be familiar with basic mathematics and have some knowledge of binary number systems. Data Communication Principles for Fixed and Wireless Networks is for students at the senior undergraduate and first year graduate levels. It can also be used as a reference work for professionals working in the areas of data networks, computer networks and internet protocols.