Comprehending as capably as accord even more than extra will pay for each success. next to, the publication as well as perspicacity of this error control coding fundamentals and applications prentice hall computer applications in electrical engineering can be taken as without difficulty as picked to act.

Error Control Coding-Sha Lin 1983 Completely updated to cover latest developments, this text provides a bridge between introductory courses in digital communications and more advanced courses in information technology. It presents state-of-the-art control techniques.

Error Control Coding-Lin Shu 2011

Error Control Coding-Sha Lin 2004 028M> A reorganized and comprehensive major revision of a classic book, this edition provides a bridge between introductory digital communications and more advanced treatment of information theory. Completely updated to cover the latest developments, it presents state-of-the-art error control techniques. 028M> Coverage of the fundamentals of coding and the applications of codes to the design of real error control systems. Contains the most recent developments of coded modulation, trellises for codes, soft-decision decoding algorithms, turbo coding for reliable data transmission and other areas. There are two new chapters on Reed-Solomon codes and concatenated coding schemes. Also contains hundreds of new and revised examples; and more than 200 illustrations of code structures, encoding and decoding circuits and error performance of many important codes and error control coding systems. 028M> Appropriate for those with minimum mathematical background as a comprehensive reference for coding theory.

Error Control Coding-Sha Lin 2004 For a first course on coding theory at the senior or beginning graduate level. A reorganized and comprehensive major revision of a classic textbook. This text provides a bridge between introductory courses in digital communications and more advanced courses in information theory. Completely updated to cover the latest developments. It presents state-of-the-art error control techniques.

Error control coding-Shu Lin 1983

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.

Essentials of Error-Control Coding Techniques-Hideki Imai 2014-06-28 Essentials of Error-Control Coding Techniques presents error-control coding techniques with an emphasis on the most recent applications. It is written for engineers who use or build error-control coding equipment. Many examples of practical applications are provided, enabling the reader to obtain valuable expertise for the development of a wide range of error-control coding systems. Necessary background knowledge of coding theory (the theory of error-correcting codes) is also included so that the reader is able to assimilate the concepts and the techniques. The book is divided into two parts. The first provides the reader with the fundamental knowledge of the coding theory that is necessary to understand the material in the latter part. Topics covered include the principles of error detection and correction, block codes, and convolutional codes. The second part is devoted to the practical applications of error-control coding in various fields. It explains how to design cost-effective error-control coding systems. Many examples of actual error-control coding systems are described and evaluated. This book is particularly suited for the engineer striving to master the practical applications of error-control coding. It is also suitable for use as a graduate text for an advanced course in coding theory.

Fundamentals of Error-Correcting Codes-W. Cary Huffman 2010-02-18 Fundamentals of Error Correcting Codes is an in-depth introduction to coding theory from both an engineering and mathematical viewpoint. As well as covering classical topics, there is much coverage of techniques which could only be found in specialist journals and book publications. Numerous exercises and examples and an accessible writing style make this a lucid and effective introduction to coding theory for advanced undergraduate and graduate students, researchers and engineers, whether approaching the subject from a mathematical, engineering or computer science background.

The Theory of Error Correcting Codes-Florence Jessie MacWilliams 1977-01-01

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 *ti coding in communication systems providing examples of encoding and decoding, information theory and criteria for code selection * Thorogh 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

Error-Correction Coding and Decoding-Martin Tomlinson 2017-02-21 This book discusses both the theory and practical applications of self-correcting data, commonly known as error-correcting codes. The applications included demonstrate the importance of these codes in a wide range of everyday technologies, from smartphones to secure communications and transactions. Written in a readily understandable style, the book presents the authors' twenty-five years of research organized into five parts: Part I is concerned with the theoretical performance attainable by using error correcting codes to achieve communications efficiency in digital communications systems. Part II explores the construction of error-correcting codes and explains the different families of codes and how they are designed. Techniques are described for producing the very best codes. Part III addresses the analysis of low-density parity-check (LDPC) codes, primarily to calculate their stopping sets and low-weight codeword spectrum which determines the performance of theese codes. Part IV deals with decoders designed to realize optimum performance. Part V describes applications which include combined error correction and detection, public key cryptography using Goppa codes, correcting errors in passwords and watermarking. This book is a valuable resource for anyone interested in error-correcting codes and their applications, ranging from non-experts to professionals at the forefront of research in their field. This book is open access under a CC BY 4.0 license.
being used in almost all modern digital electronic systems and data control coding for more than fifty years. Nowadays, error-control codes are practical applications. The first practical binary codes were introduced by less than channel capacity, would transmit error-free information for all leads to important useful advances. Claude Shannon in 1948 proved the which elegant theory was motivated by practical problems so that it often involve complex mathematical computations, and mapping them directly to hardware often leads to very high complexity. VLSI Architectures for Modern Error-Correcting Codes serves as a bridge connecting advancements in coding theory to practical hardware implementations. Instead of focusing on circuit-level design techniques, the book highlights integrated algorithmic and architectural transformations that lead to great improvements on throughput, silicon area requirement, and/or power consumption in the hardware implementation. The goal of this book is to provide a comprehensive and systematic review of available techniques and architectures, so that they can be easily followed by system and hardware designers to develop en/decoder implementations that meet error-correcting performance and cost requirements. This book can be also used as a reference for graduate-level courses on VLSI design and error-correcting coding. Particular emphasis is placed on hard- and soft-decision Reed-Solomon (RS) and Bose-Chaudhuri-Hocquenghem (BCH) codes, and binary and non-binary low-density parity-check (LDPC) codes. These codes are among the best candidates for modern and emerging applications due to their good error-correcting performance and lower implementation complexity compared to other codes. To help explain the computations and en/decoder architectures, many examples and case studies are included. More importantly, discussions are provided on the advantages and drawbacks of different implementation approaches and architectures.

Error-Control Coding—William Ryan 2009-09-17 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, Professor 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, finite-field 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.

Fundamentals of Convolutional Coding—Rolf Johannesson 2015-05-19 Fundamentals of Convolutional Coding, Second Edition, regarded as a bible of convolutional coding brings you a clear and comprehensive discussion of the basic principles of this field. Two new chapters on low-density parity-check (LDPC) convolutional codes and iterating coding, Viterbi, BCJR, BEAST, list, and sequential decoding of convolutional codes Distance properties of convolutional codes includes a downloadable solutions manual

VLSI Architectures for Modern Error-Correcting Codes—Xinmiao Zhang 2017-12-19 Error-correcting codes are ubiquitous. They are adopted in almost every modern digital communication and storage system, such as wireless communication, digital signal processing, flash memories, computer hard drives, sensor networks, and deep-space probing. New-generation and emerging applications demand codes with better error-correcting capability. On the other hand, the design and implementation of these high-gain error-correcting codes pose many challenges. They usually involve complex mathematical computations, and mapping them directly to hardware often leads to very high complexity. VLSI Architectures for Modern Error-Correcting Codes serves as a bridge connecting advancements in coding theory to practical hardware implementations. Instead of focusing on circuit-level design techniques, the book highlights integrated algorithmic and architectural transformations that lead to great improvements on throughput, silicon area requirement, and/or power consumption in the hardware implementation. The goal of this book is to provide a comprehensive and systematic review of available techniques and architectures, so that they can be easily followed by system and hardware designers to develop en/decoder implementations that meet error-correcting performance and cost requirements. This book can be also used as a reference for graduate-level courses on VLSI design and error-correcting coding. Particular emphasis is placed on hard- and soft-decision Reed-Solomon (RS) and Bose-Chaudhuri-Hocquenghem (BCH) codes, and binary and non-binary low-density parity-check (LDPC) codes. These codes are among the best candidates for modern and emerging applications due to their good error-correcting performance and lower implementation complexity compared to other codes. To help explain the computations and en/decoder architectures, many examples and case studies are included. More importantly, discussions are provided on the advantages and drawbacks of different implementation approaches and architectures.

Iterative Error Correction—Sarah J. Johnson 2009-11-19 Presents all of the key ideas needed to understand, design, implement and analyse iterative-based error correction schemes.

Channel Codes—William Ryan 2009-09-17 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, Professor 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, finite-field 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.

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 modern 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.

Performance Modeling for Computer Architects—C. M. Krishna 1995-10-14 As computers become more complex, the number and complexity of the tasks facing the computer architect have increased. Computer performance often depends in complex ways on such parameters and intuitions that must be supported by performance studies to enhance design productivity. This book introduces computer architects to system performance models and shows how they are relatively simple, inexpensive to implement, and sufficiently accurate for most purposes. It discusses the development of performance models based on queuing theory and simulation. The text also shows more that the incremental changes in cache size can have on the miss rate. A particularly deep knowledge of probability theory or any other mathematical field to understand the papers in this volume is not required. 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, mathematicians, 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 also 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.

Fundamentals of Information Theory and Coding—Monica Borda 2011-05-27 The work introduces the fundamentals concerning the measure of discrete information, the modeling of discrete sources and signals, the quantization of information, and the transmission of information through channels and coding. The understanding of the theoretical model is supported by many examples. One particular emphasis is put on the explanation of Gnostic Coding. Many examples throughout the book are chosen from this particular area and several parts of the book are devoted to this exciting implication of coding.

Error-correcting Codes—William Wesley Peterson 1972 The coding problem; Introduction to algebra; Linear codes; Error correction capabilities of linear codes; Important linear block codes; Polynomial rings and Galois fields; Linear switching circuits; Cyclic codes; Bose-Chaudhuri-Hocquenghem codes; Arithmetic codes.

Fundamentals of Digital Communication—Upamanyu Madhow 2008-03-06 This is a concise presentation of the concepts underlying the design of digital communication systems, without the detail that can overwhelm students. Many examples, from the basic to the cutting-edge, are provided to help explain the theory. The work introduces the fundamentals concerning the measure of discrete information, the modeling of discrete sources and systems, the quantization of information, and the transmission of information through channels and coding. The understanding of the theoretical model is supported by many examples. One particular emphasis is put on the explanation of Gnostic Coding. Many examples throughout the book are chosen from this particular area and several parts of the book are devoted to this exciting implication of coding.
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 that enables computation of performance benchmarks to compare them against. Other unique features include time-space communication and geometric insights into noncoherent communication and equalization.

An Introduction to Error Correcting Codes with Applications - Scott A. Vanstone 2013-04-18 5. 2 Rings and Ideals 148 5. 3 Ideals and Cyclic Subspaces 152 5. 4 Generator Matrices and Parity-Check Matrices 159 5. 5 Encoding Cyclic Codest 163 5. 6 Syndromes and Simple Decoding Procedures 168 5. 7 Burst Error Correcting 175 5. 8 Finite Fields and Factoring xn-1 over GF(2) 181 5. 9 Another Method for Factorizing xn-1 over GF(2) 187 5. 10 Exercises 193 Chapter 6 BCH Codes and Bounds for Cyclic Codes 6. 1 Introduction 201 6. 2 BCH Codes and the BCH Bound 205 6. 3 Bounds for Cyclic Codest 210 6. 4 Decoding BCH Codes 215 6. 5 Linearized Polynomials and Finding Roots of Polynomialst 224 6. 6 Exercises 231 Chapter 7 Error Correction Techniques and Digital Audio Recording 7. 1 Introduction 237 7. 2 Reed-Solomon Codes 237 7. 3 Channel Erasures 240 7. 4 BCH Decoding with Erasures 244 7. 5 Interleaving 250 7. 6 Error Correction and Digital Audio Recording 256 7.

Introduction to Coding Theory - Ron Roth 2006-02-23 This 2006 book introduces the theoretical foundations of error-correcting codes for senior-undergraduate to graduate students.

Introduction to Neural Networks Using Matlab 6.0-S. N. Sivanandam 2006

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. 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.

Digital Communication - Edward A. Lee 2012-12-06 This book concerns digital communication. Specifically, we treat the transport of bit streams from one geographical location to another over various physical media, such as wire pairs, coaxial cable, optical fiber, and radio waves. Further, we cover the multiple access and synchronization issues relevant to the constructing communication network which simultaneously transport bit streams from many users. The material in this book is thus directly relevant to the design of a multitude of digital communication systems, including for example local and metropolitan area data networks, voice and video telephony systems, digital CATV distribution, digital cellular and radio systems, the narrowband ISDN, the broadband ISDN, the ISDN, computer communication systems, voiceband data modems, and satellite communication sys tems. We extract the common principles underlying these and other applications and present them in a unified framework. This book is intended for designers and would-be designers of digital communication systems. To limit the scope to manageable proportions we have had to be selective in the topics covered and in the depth of coverage. In the case of advanced information, coding, and detection theory, for example, we have not tried to duplicate the in-depth coverage of many advanced textbooks, but rather have tried to cover those aspects directly relevant to the design of digital communication systems.

Fundamentals of Codes, Graphs, and Iterative Decoding - Stephen B. Wicker 2006-04-18 Fundamentals of Codes, Graphs, and Iterative Decoding is an explanation of how to introduce local connectivity, and how to exploit simple structural descriptions. Chapter 1 provides an overview of Shannon theory and the basic tools of complexity theory, communication theory, and bounds on code construction. Chapters 2 - 4 provide an overview of "classical" error control coding, with an introduction to abstract algebra, and block and convolutional codes. Chapters 5 - 9 then proceed to systematically develop the key research results of the 1990s and early 2000s with an introduction to graph theory, followed by chapters on algorithms on graphs, turbo error control, low density parity check codes, and low density generator codes.

Foundations of Coding - Jiri Adamek 2011-02-14 Although devoted to constructions of good codes for error control, secrecy or data compression, the emphasis is on the first direction. Introduces a number of important classes of error-detecting and error-correcting codes as well as their decoding methods. Background material on modern algebra is presented where required. The role of error-correcting codes in modern cryptography is treated as are data compression and other topics related to information theory. The definition-theorem proof style used in mathematics texts is employed through the book but formalism is avoided wherever possible.

Practical Error Correction Design for Engineers - Neal Glover 1991

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

Introduction To Error Control Codes - Sasivatra Gravano 2007-05-07

Coding and Information Theory - Steven Roman 1992-06-04 This book is an introduction to information and coding theory at the graduate or advanced undergraduate level. It assumes a basic knowledge of probability and modern algebra, but is otherwise self-contained. The intent is to describe as clearly as possible the fundamental issues involved in these subjects, rather than covering all aspects in an encyclopedic fashion. The first quarter of the book is devoted to introduction to information theory, including a proof of Shannon's famous Noisy Coding Theorem. The remainder of the book is devoted to coding theory and is independent of the information theory portion of the book. After a brief discussion of general families of codes, the author discusses linear codes (including the Hamming, Golary, the Reed-Muller codes), finite fields, and cyclic codes (including the BCH, Reed-Solomon, Justesen, Goppa, and Quadratic Residue codes). An appendix reviews relevant topics from modern algebra.

Quantum Information Processing and Quantum Error Correction - Ivan Djordjevic 2012 Quantum Information Processing and Quantum Error Correction is a self-contained, tutorial-based introduction to quantum information, quantum computation, and quantum error-correction. Assuming no knowledge of quantum mechanics and written at an intuitive level suitable for the engineer, the book gives all the essential principles needed to design and implement quantum electronic and photonic circuits. Numerous examples from a wide area of application are given to show how the principles can be implemented in practice. This book is ideal for the electronics, photons and computer engineer who requires an easy-to-understand foundation on the principles of quantum information processing and quantum error correction, together with insight into how to develop quantum electronic and photonic circuits. Readers of this book will be ready for further study in this area, and will be prepared to perform independent research. The reader completed the book will be able design the information processing circuits, stabilizer codes, Calderbank-Shor-Steane (CSS) codes, subsystem codes, topological codes and entanglement-assisted quantum error correction codes; and propose corresponding physical implementation. The reader completed the book will be proficient in quantum fault-tolerant design as well. Unique Features Unique in covering both quantum information processing and quantum error correction - everything in one book that an engineer needs to understand and implement quantum-level circuits. Gives an intuitive understanding by not assuming knowledge of quantum mechanics, thereby avoiding heavy mathematics. In-depth coverage of the design and implementation of quantum information
Error Control Coding for B3G/4G Wireless Systems - Thierry Lestable

2011-03-10  Covering the fast evolving area of advanced coding, Error Control Coding for B3G/4G Wireless Systems targets IMT-Advanced systems to present the latest findings and implementation solutions. The book begins by detailing the fundamentals of advanced coding techniques such as Coding, Decoding, Design, and Optimization. It provides not only state-of-the-art research findings in 3D Turbo-codes, non-binary LDPC Codes, Fountain, and Raptor codes, but also insights into their real-world implementation by examining hardware architecture solutions, for example VLSI complexity, FPGA, and ASIC. Furthermore, special attention is paid to Incremental redundancy techniques, which constitute a key feature of Wireless Systems. A promising application of these advanced coding techniques, the Turbo-principle (also known as iterative processing), is illustrated through an in-depth discussion of Turbo-MIMO, Turbo-Equalization, and Turbo-Interleaving techniques. Finally, the book presents the status of major standardization activities currently implementing such techniques, with special interest in 3GPP UMTS, LTE, WiMAX, IEEE 802.11n, DVB-RCS, DVB-S2, and IEEE 802.22. As a result, the book coherently brings together academic and industry vision by providing readers with a uniquely comprehensive view of the whole topic, whilst also giving an understanding of leading-edge techniques. Includes detailed coverage of coding, decoding, design, and optimization approaches for advanced codes. Provides up to date research findings from both highly reputed academics and industry standpoints. Presents the latest status of standardization activities for Wireless Systems related to advanced coding. Describes real-world implementation aspects by giving insights into architecture solutions for both LDPC and Turbo-codes. Examines the most advanced and promising concepts of turbo-processing applications: Turbo-MIMO, Turbo-Equalization, Turbo-Interleaving.

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 as spatial coupling A focus on algorithmic and implementation aspects of error control coding.

Source Coding - Thomas Wiegand

2011-01-05 Emphasizes source coding techniques that have become relevant for video coding in recent years. For illustrating the concepts and efficiency of the basic sources coding techniques, the authors provide numerous examples and experimental results for simple model sources.

Introduction to Digital Communications - Ali Grami

2015-02-25 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 multisuser 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.

Coding Theory - San Ling

2004-02-12 Modern introduction to theory of coding and decoding with many exercises and examples.

An Introduction to Error-correcting Codes - Shu Lin

1970 Codes, Kodierung (Telegrafie); Kodierung, Datendarstellung, Bit, Byte (EDV).

Source and Channel Coding - John B. Anderson

1991-09-30 O should coded communication be approached? Is it about probability theorems and bounds, or about algorithms and structures? The traditional course in information theory and coding teaches these together in one course in which the Shannon theory, a probabilistic the ory of information, dominates. The theory's predictions and bounds to performance are valuable to the coding engineer, but coding today is mostly about structures and algorithms and their size, speed and error performance. While coding has a theoretical basis, it has a practical side as well, an engineering side in which costs and benefits matter. It is safe to say that most of the recent advances in information theory and coding are in the engineering of coding. These thoughts motivate the present text book. A coded communication book based on methods and algorithms, with information theory in a necessary but supporting role. There has been much recent progress in coding, both in the theory and the practice, and these pages report many new advances. Chapter 2 cov ers traditional source coding, but also the coding ofreal onedimensional sources like speech and new techniques like vector quantization. Chapter 4 is a unified treatment of trellis codes, beginning with binary convolutional codes and passing to the new trellis modulation codes.