

Error Control Coding 2nd Edition By Shu Lin

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Cayci S and Eryilmaz A (2019) Optimal Learning for Dynamic Coding in Deadline-Constrained Multi-Channel Networks, IEEE/ACM Transactions on Networking (TON), 27:3, (1043-1054), Online publication date: 1-Jun-2019.

Error Control Coding, Second Edition | Guide books

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Some new error-resilient source coding and joint source/channel coding techniques are proposed for the transmission of multimedia sources over error-prone channels.

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performance and bounds 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 find 0130426725 error control coding 2nd edition by lin et al at over 30 bookstores buy rent or sell 56 cyclic hamming codes 162 57 error ...

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.

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.

Building on the success of the first edition, which offered a practical introductory approach to the techniques of error concealment, this book, now fully revised and updated, provides a comprehensive treatment of the subject and includes a wealth of additional features. The Art of Error Correcting Coding, Second Edition explores intermediate and advanced level concepts as well as those which will appeal to the novice. All key topics are discussed, including Reed-Solomon codes, Viterbi decoding, soft-output decoding algorithms, MAP, log-MAP and MAX-log-MAP. Reliability-based algorithms GMD and Chase are examined, as are turbo codes, both serially and parallel concatenated, as well as low-density parity-check (LDPC) codes and their iterative decoders. Features additional problems at the end of each chapter and an instructor's solutions manual Updated companion website offers new C/C ++programs and MATLAB scripts, to help with the understanding and implementation of basic ECC techniques Easy to follow examples illustrate the fundamental concepts of error correcting codes Basic analysis tools are provided throughout to help in the assessment of the error performance block and convolutional codes of a particular error correcting coding (ECC) scheme for a selection of the basic channel models This edition provides an essential resource to engineers, computer scientists and graduate students alike for understanding and applying ECC techniques in the transmission and storage of digital information.

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.

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.

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.

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

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 these 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.

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 * 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

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