1. Record Nr. UNINA9910831055703321

Autore	Morelos-Zaragoza Robert H
Titolo	The Art of Error Correcting Coding [[electronic resource]]
Pubbl/distr/stampa	Hoboken, : Wiley, 2006
ISBN	1-280-51916-9 9786610519163 0-470-03570-6 0-470-03569-2
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (279 p.)
Classificazione	54.10
Disciplina	621.3822 621.38220151
Soggetti	Computer algorithms Error-correcting codes (Information theory) Mathematics Electrical & Computer Engineering Telecommunications Algebra Engineering & Applied Sciences Physical Sciences & Mathematics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di contenuto	The Art of Error Correcting Coding; Contents; Preface; Foreword; The ECC web site; 1 Introduction; 1.1 Error correcting coding: Basic concepts; 1.1.1 Block codes and convolutional codes; 1.1.2 Hamming distance, Hamming spheres and error correcting capability; 1.2 Linear block codes; 1.2.1 Generator and parity-check matrices; 1.2.2 The weight is the distance; 1.3 Encoding and decoding of linear block codes; 1.3.1 Encoding with G and H; 1.3.2 Standard array decoding; 1.3.3 Hamming spheres, decoding regions and the standard array; 1.4 Weight distribution and error performance 1.4.1 Weight distribution and undetected error probability over a BSC1. 4.2 Performance bounds over BSC, AWGN and fading channels; 1.5 General structure of a hard-decision decoder of linear codes; Problems;

2 Hamming, Golay and Reed-Muller codes; 2.1 Hamming codes; 2.1.1 Encoding and decoding procedures; 2.2 The binary Golay code; 2.2.1 Encoding; 2.2.2 Decoding; 2.2.3 Arithmetic decoding of the extended (24, 12, 8) Golay code; 2.3 Binary Reed-Muller codes; 2.3.1 Boolean polynomials and RM codes; 2.3.2 Finite geometries and majority-logic decoding; Problems; 3 Binary cyclic codes and BCH codes
3.1 Binary cyclic codes3.1.1 Generator and parity-check polynomials; 3.1.2 The generator polynomial; 3.1.3 Encoding and decoding of binary cyclic codes; 3.1.4 The parity-check polynomial; 3.1.5 Shortened cyclic codes and CRC codes; 3.1.6 Fire codes; 3.2 General decoding of cyclic codes; 3.2.1 GF(2m) arithmetic; 3.3 Binary BCH codes; 3.3.1 BCH bound; 3.4 Polynomial codes; 3.5 Decoding of binary BCH codes; 3.5.1 General decoding algorithm for BCH codes; 3.5.2 The Berlekamp-Massey algorithm (BMA); 3.5.3 PGZ decoder; 3.5.4 Euclidean algorithm; 3.5.5 Chien search and error correction
3.5.6 Errors-and-erasures decoding3.6 Weight distribution and performance bounds; 3.6.1 Error performance evaluation; Problems; 4 Nonbinary BCH codes: Reed-Solomon codes; 4.1 RS codes as polynomial codes; 4.2 From binary BCH to RS codes; 4.3 Decoding RS codes; 4.3.1 Remarks on decoding algorithms; 4.3.2 Errors-and-erasures decoding; 4.4 Weight distribution; Problems; 5 Binary convolutional codes; 5.1 Basic structure; 5.1.1 Recursive systematic convolutional codes; 5.1.2 Free distance; 5.2 Connections with block codes; 5.2.1 Zero-tail construction; 5.2.2 Direct-truncation construction
5.2.3 Tail-biting construction5.2.4 Weight distributions; 5.3 Weight enumeration; 5.4 Performance bounds; 5.5 Decoding: Viterbi algorithm with Hamming metrics; 5.5.1 Maximum-likelihood decoding and metrics; 5.5.2 The Viterbi algorithm; 5.5.3 Implementation issues; 5.6 Punctured convolutional codes; 5.6.1 Implementation issues related to punctured convolutional codes; 5.6.2 RCPC codes; Problems; 6 Modifying and combining codes; 6.1 Modifying codes; 6.1.1 Shortening; 6.1.2 Extending; 6.1.3 Puncturing; 6.1.4 Augmenting, expurgating and lengthening; 6.2 Combining codes
6.2.1 Time sharing of codes

Sommario/riassunto

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 algorith