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Title: Error-control techniques for digital communication

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Abstract

The reliable transmission of digital information is discussed, taking into account the communication system design problem, the elements of a digital communication system, important channel models, information theory and channel capacity, modulation performance on the AWGN channel, and combined modulation and coding for efficient signal design. Other topics studied are related to fundamental and simple block codes, the algebra of linear block codes, binary cyclic codes and BCH codes, decoding techniques for binary BCH codes, nonbinary BCH codes and Reed-Solomon codes, the performance of linear block codes with bounded-distance decoding an introduction to convolutional codes, maximum likelihood decoding of convolutional codes, sequential decoding, and applications of error-control coding. Attention is given to groups, fields, vector spaces, binary linear block codes, the parity-check matrix revisited, dual codes, Hamming distance and the weight distribution, code geometry and error-correction capability, and the representations of finite fields.

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