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algorithm for solving the multicast problem; 1.3. Random network coding; 1.3.1. The algebraic approach; 1.3.2. The combinatorial approach; 1.3.2.1. Flow bounds; 1.3.2.2. The bounds by Balli, Yan, and Zhang; 1.4. Bibliographic notes; References; Steganography from a Coding Theory Point of View C. Munuera; 2.1. Introduction; 2.1.1. What is steganography?; 2.1.2. Digital steganography; 2.1.3. Steganography, cryptography and watermarking; 2.1.4. About this chapter; 2.2. Steganographic systems; 2.2.1. The cover 2.2.2. Steganographic schemes 2.2.3. Selection rules; 2.2.4. Parameters; 2.2.5. Proper stegoschemes; 2.3. Error-Correcting codes; 2.3.1. Correcting errors; 2.3.2. Linear codes over fields; 2.3.3. An example: binary Hamming codes; 2.3.4. Generalized Hamming weights for linear codes; 2.4. Linking the problems; 2.4.1. Stegoschemes and error-correcting codes; 2.4.2. Group codes and stegoschemes; 2.4.3. Linear stegoschemes over rings Z_q ; 2.4.4. Linear stegoschemes over fields; 2.5. Bounds; 2.5.1. The domain of stegoschemes; 2.5.2. Balls and entropy; 2.5.3. A Hamming-like bound 2.5.4. Asymptotic bounds 2.5.5. Perfect stegoschemes; 2.5.6. Another new problem for coding theory; 2.6. Nonshared selection rules; 2.6.1. Wet paper codes; 2.6.2. Solvability and the weight hierarchy of codes; 2.6.3. The rank of random matrices; 2.7. The ZZW embedding construction; 2.7.1. Description of the method; 2.7.2. Asymptotic behavior; 2.8. Bibliographical notes and further reading; Acknowledgments; References; An Introduction to LDPC Codes I. Marquez-Corbella and E. Martnez-Moro; 3.1. Introduction; 3.2. Representation for LDPC codes; 3.2.1. Tanner graph; 3.3. Communication channels 3.4. Decoding algorithms

Sommario/riassunto

Algebraic & geometry methods have constituted a basic background and tool for people working on classic block coding theory and cryptography. Nowadays, new paradigms on coding theory and cryptography have arisen such as: Network coding, S-Boxes, APN Functions, Steganography and decoding by linear programming. Again understanding the underlying procedure and symmetry of these topics needs a whole bunch of non trivial knowledge of algebra and geometry that will be used to both, evaluate those methods and search for new codes and cryptographic applications. This book shows those methods in a self
