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Nota di contenuto	1. Information theory -- 1.1 Information measurement -- 1.2 Requirements for an information metric -- 2. Sources of information -- 2.1 Source coding -- 2.2 Extension of a memoryless discrete source -- 2.3 Prefix codes -- 2.4 The information unit -- 3. Source coding -- 3.1 Types of source codes -- 3.2 Construction of instantaneous codes -- 3.3 Kraft inequality -- 3.4 Huffman code -- 4. Information transmission -- 4.1 The concept of information theory -- 4.2 Joint information measurement -- 4.3 Conditional entropy -- 4.4 Model for a communication channel -- 4.5 Noiseless channel -- 4.6 Channel with independent output and input -- 4.7 Relations between the entropies -- 4.8 Mutual information -- 4.9 Channel capacity -- 5. Multiple access systems -- 5.1 Introduction -- 5.2 The Gaussian multiple access channel -- 5.3 The Gaussian channel with Rayleigh fading -- 5.4 The noncooperative multiple access channel -- 5.5 Multiple access in a dynamic environment -- 5.6 Analysis of the capacity for a Markovian multiple access channel -- 6. Code division multiple access -- 6.1 Introduction -- 6.2 Fundamentals of spread spectrum signals -- 6.3 Performance analysis of CDMA systems -- 6.4 Sequence design -- 7. The capacity of a CDMA system -- 7.1 Introduction -- 7.2 Analysis of a CDMA system with a fixed number of users and small SNR -- 7.3

CDMA system with a fixed number of users and high SNR -- 7.4 A tight bound on the capacity of a CDMA system --
8. Theoretical cryptography -- 8.1 Introduction -- 8.2 Cryptographic aspects of computer networks -- 8.3 Principles of cryptography -- 8.4 Information theoretical aspects of cryptography -- 8.5 Mutual information for cryptosystems --
Appendix A. Probability theory -- Set theory and measure -- Basic probability theory -- Random variables -- References -- About the author -- Index.

Sommario/riassunto

The book presents the historical evolution of Information Theory, along with the basic concepts linked to information. It discusses the information associated to a certain source and the usual types of source codes, the information transmission, joint information, conditional entropy, mutual information, and channel capacity. The hot topic of multiple access systems, for cooperative and noncooperative channels, is discussed, along with code division multiple access (CDMA), the basic block of most cellular and personal communication systems, and the capacity of a CDMA system. The information theoretical aspects of cryptography, which are important for network security, a topic intrinsically connected to computer networks and the Internet, are also presented. The book includes a review of probability theory, solved problems, illustrations, and graphics to help the reader understand the theory.