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	Autore	Kuhn Volker
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	Nota di contenuto	Wireless Communications over MIMO Channels; Contents; Preface; Acknowledgements; List of Abbreviations; List of Symbols; 1 Introduction to Digital Communications; 1.1 Basic System Model; 1.1.1 Introduction; 1.1.2 Multiple Access Techniques; 1.1.3 Principle Structure of SISO Systems; 1.2 Characteristics of Mobile Radio Channels; 1.2.1 Equivalent Baseband Representation; 1.2.2 Additive White Gaussian Noise; 1.2.3 Frequency-Selective Time-Variant Fading; 1.2.4 Systems with Multiple Inputs and Outputs; 1.3 Signal Detection; 1.3.1 Optimal Decision Criteria; 1.3.2 Error Probability for AWGN Channel
		1.3.3 Error and Outage Probability for Flat Fading Channels1.3.4 Time-Discrete Matched Filter; 1.4 Digital Linear Modulation; 1.4.1 Introduction; 1.4.2 Amplitude Shift Keying (ASK); 1.4.3 Quadrature Amplitude Modulation (QAM); 1.4.4 Phase Shift Keying (PSK); 1.5 Diversity; 1.5.1 General Concept; 1.5.2 MRC for Independent Diversity Branches; 1.5.3 MRC for Correlated Diversity Branches; 1.6 Summary; 2 Information Theory; 2.1 Basic Definitions; 2.1.1 Information, Redundancy, and Entropy; 2.1.2 Conditional, Joint and Mutual

Information; 2.1.3 Extension for Continuous Signals

2.1.4 Extension for Vectors and Matrices2.2 Channel Coding Theorem for SISO Channels; 2.2.1 Channel Capacity; 2.2.2 Cutoff Rate; 2.2.3 Gallager Exponent; 2.2.4 Capacity of the AWGN Channel; 2.2.5 Capacity of Fading Channel; 2.2.6 Channel Capacity and Diversity; 2.3 Channel Capacity of MIMO Systems; 2.4 Channel Capacity for Multiuser Communications; 2.4.1 Single Antenna AWGN Channel; 2.4.2 Single Antenna Flat Fading Channel; 2.4.3 Multiple Antennas at Transmitter and Receiver; 2.5 Summary; 3 Forward Error Correction Coding; 3.1 Introduction; 3.2 Linear Block Codes

3.2.1 Description by Matrices3.2.2 Simple Parity Check and Repetition Codes; 3.2.3 Hamming and Simplex Codes; 3.2.4 Hadamard Codes; 3.2.5 Trellis Representation of Linear Block Codes; 3.3 Convolutional Codes; 3.3.1 Structure of Encoder; 3.3.2 Graphical Description of Convolutional Codes; 3.3.3 Puncturing Convolutional Codes; 3.3.4 ML Decoding with Viterbi Algorithm; 3.4 Soft-Output Decoding of Binary Codes; 3.4.1 Log-Likelihood Ratios - A Measure of Reliability; 3.4.2 General Approach for Soft-Output Decoding; 3.4.3 Soft-Output Decoding for Walsh Codes

3.4.4 BCJR Algorithm for Binary Block Codes3.4.5 BCJR Algorithm for Binary Convolutional Codes; 3.4.6 Implementation in Logarithmic Domain; 3.5 Performance Evaluation of Linear Codes; 3.5.1 Distance Properties of Codes; 3.5.2 Error Rate Performance of Codes; 3.5.3 Information Processing Characteristic; 3.6 Concatenated Codes; 3.6.1 Introduction; 3.6.2 Performance Analysis for Serial Concatenation; 3.6.3 Performance Analysis for Parallel Concatenation; 3.6.4 Turbo Decoding of Concatenated Codes; 3.6.5 EXIT Charts Analysis of Turbo Decoding; 3.7 Low-Density Parity Check (LDPC) Codes

3.7.1 Basic Definitions and Encoding

Sommario/riassunto	Wireless Communications over MIMO Channels: Applications to CDMA and Multiple Antenna Systems covers both, state-of-the-art channel coding concepts and CDMA and multiple antenna systems, rarely found in other books on the subject. Furthermore, an information theoretical analysis of CDMA and SDMA systems illuminate ultimate limits and demonstrates the high potential of these concepts. Besides spatial multiplexing, the use of multiple transmit antennas in order to increase the link reliability by diversity concepts (space-time coding) is described. Another focus is the application of er