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Autore	Vary Peter
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Nota di contenuto	Digital Speech Transmission; Contents; Preface; 1 Introduction; 2 Models of Speech Production and Hearing; 2.1 Organs of Speech Production; 2.2 Characteristics of Speech Signals; 2.3 Model of Speech Production; 2.3.1 Acoustic Tube Model of the Vocal Tract; 2.3.2 Digital All-Pole Model of the Vocal Tract; 2.4 Anatomy of Hearing; 2.5 Psychoacoustic Properties of the Auditory Organ; 2.5.1 Hearing and Loudness; 2.5.2 Spectral Resolution; 2.5.3 Masking; Bibliography; 3 Spectral Transformations; 3.1 Fourier Transform of Continuous Signals; 3.2 Fourier Transform of Discrete Signals 3.3 Linear Shift Invariant Systems3.3.1 Frequency Response of LSI Systems; 3.4 The z-transform; 3.4.1 Relation to FT; 3.4.2 Properties of the ROC; 3.4.3 Inverse z-transform; 3.4.4 z-transform Analysis of LSI Systems; 3.5 The Discrete Fourier Transform; 3.5.1 Linear and Cyclic Convolution; 3.5.2 The DFT of Windowed Sequences; 3.5.3 Spectral Resolution and Zero Padding; 3.5.4 Fast Computation of the DFT: The

FFT; 3.5.5 Radix-2 Decimation-in-Time FFT; 3.6 Fast Convolution; 3.6.1 Fast Convolution of Long Sequences; 3.6.2 Fast Convolution by Overlap-Add; 3.6.3 Fast Convolution by Overlap-Save
3.7 Cepstral Analysis3.7.1 Complex Cepstrum; 3.7.2 Real Cepstrum; 3.7.3 Applications of the Cepstrum; Bibliography; 4 Filter Banks for Spectral Analysis and Synthesis; 4.1 Spectral Analysis Using Narrowband Filters; 4.1.1 Short-Term Spectral Analyzer; 4.1.2 Prototype Filter Design for the Analysis Filter Bank; 4.1.3 Short-Term Spectral Synthesizer; 4.1.4 Short-Term Spectral Analysis and Synthesis; 4.1.5 Prototype Filter Design for the Analysis-Synthesis Filter Bank; 4.1.6 Filter Bank Interpretation of the DFT; 4.2 Polyphase Network Filter Banks; 4.2.1 PPN Analysis Filter Bank
4.2.2 PPN Synthesis Filter Bank4.3 Quadrature Mirror Filter Banks; 4.3.1 Analysis-Synthesis Filter Bank; 4.3.2 Compensation of Aliasing and Signal Reconstruction; 4.3.3 Efficient Implementation; Bibliography; 5 Stochastic Signals and Estimation; 5.1 Basic Concepts; 5.1.1 Random Events and Probability; 5.1.2 Conditional Probabilities; 5.1.3 Random Variables; 5.1.4 Probability Distributions and Probability Density Functions; 5.1.5 Conditional PDFs; 5.2 Expectations and Moments; 5.2.1 Conditional Expectations and Moments; 5.2.2 Examples; 5.2.3 Transformation of a Random Variable
5.2.4 Relative Frequencies and Histograms5.3 Bivariate Statistics; 5.3.1 Marginal Densities; 5.3.2 Expectations and Moments; 5.3.3 Uncorrelatedness and Statistical Independence; 5.3.4 Examples of Bivariate PDFs; 5.3.5 Functions of Two Random Variables; 5.4 Probability and Information; 5.4.1 Entropy; 5.4.2 Kullback-Leibler Divergence; 5.4.3 Mutual Information; 5.5 Multivariate Statistics; 5.5.1 MultivariateGaussian Distribution; 5.5.2 2-distribution; 5.6 Stochastic Processes; 5.6.1 Stationary Processes; 5.6.2 Auto-correlation and Auto-covariance Functions
5.6.3 Cross-correlation and Cross-covariance Functions

Sommario/riassunto

The enormous advances in digital signal processing (DSP) technology have contributed to the wide dissemination and success of speech communication devices - be it GSM and UMTS mobile telephones, digital hearing aids, or human-machine interfaces. Digital speech transmission techniques play an important role in these applications, all the more because high quality speech transmission remains essential in all current and next generation communication networks. Enhancement, coding and error concealment techniques improve the transmitted speech signal at all stages of the transmission chain, from