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Nota di contenuto	An Introduction to Parametric Digital Filters and Oscillators; Contents; Preface; 1 Introduction: Basis of Discrete Signals and Digital Filters; 1.1 Discrete Signals and Systems; 1.2 Discrete Signals; 1.2.1 Time-Domain Representation for Discrete Signals; 1.2.2 Presentation of Discrete Signals by Fourier Transform; 1.2.3 Discrete Fourier Transform; 1.2.4 Laplace and z-Transforms; 1.3 Time-Invariant Discrete Linear Systems; 1.3.1 Difference Equation and Impulse Response; 1.3.2 DLS Representation via Transfer Function; 1.4 Stability and Causality of Discrete Systems 1.5 Frequency Response of a Discrete Linear System1.5.1 Properties of

the Frequency Response of a Discrete Linear System; 1.5.2 Transfer Function versus Frequency Response; 1.6 Case Study: Low-Order Filters; 1.6.1 Purely Recursive Filters; 1.6.2 Effects of Word Length Limitation; 1.6.3 Transversal and Combined Filters; 1.7 Summary; 1.8 Abbreviations; 1.9 Variables; 1.10 References; Part One Linear Discrete Time-Variant Systems; 2 Main Characteristics of Time-Variant Systems; 2.1 Description of a Linear Time-Variant Discrete System Through Difference Equations; 2.2 Impulse Response; 2.3 Generalized Transfer Function; 2.4 Signals Analysis in Frequency Domain; 2.5 Sampling Frequency Choice for Linear Time-Variant Discrete Systems; 2.6 Random Signals Processing in Linear Time-Variant Discrete Systems; 2.7 Combinations of Time-Variant Systems; 2.7.1 Parallel Connections; 2.7.2 Cascade Connections; 2.7.3 Systems with Feedback; 2.7.4 Continuous and Discrete LTV Systems; 2.8 Time-Varying Sampling; 2.8.1 Systems with Non-Uniform Sampling; 2.8.2 Systems with Stochastic Sampling Interval; 2.9 Summary; 2.10 Abbreviations; 2.11 Variables; 2.12 References; 3 Periodically Time-Variant Discrete Systems; 3.1 Difference Equation; 3.2 Impulse Response; 3.3 Generalized Transfer Function and Frequency Response; 3.4 Signals in Periodically Linear Time-Variant Systems; 3.4.1 Bifrequency Function; 3.4.2 Deterministic Signal Processing; 3.4.3 Random Signals Processing; 3.5 Generalization of the Sampling Theorem; 3.6 System Stability; 3.6.1 General Stability Problem; 3.6.2 Selection of Stability Criteria; 3.6.3 Stability Evaluation; 3.6.4 Stability of Parametric Recursive Systems; 3.7 Stability of Second-Order Systems; 3.8 Stability of Stochastic Systems; 3.9 Summary; 3.10 Abbreviations; 3.11 Variables; 3.12 References; Part Two Parametric Systems; 4 Parametric Filters Analysis; 4.1 Non-Recursive Parametric Filters; 4.2 The First-Order Recursive Parametric Filter; 4.2.1 Impulse Response; 4.2.2 Generalized Transfer Function; 4.3 A Recursive Parametric Filter of the Second Order; 4.3.1 Impulse Response; 4.3.2 Generalized Transfer Function; 4.4 Parametric Filters of an Arbitrary Order; 4.4.1 Direct Equation Solution; 4.4.2 Equation Solution in a State Space; 4.5 Approximate Method for Analysis of Periodical Linear Time-Variant Discrete Systems; 4.6 Summary

Sommario/riassunto

Since the 1960s Digital Signal Processing (DSP) has been one of the most intensive fields of study in electronics. However, little has been produced specifically on linear non-adaptive time-variant digital filters. * The first book to be dedicated to Time-Variant Filtering* Provides a complete introduction to the theory and practice of one of the subclasses of time-varying digital systems, parametric digital filters and oscillators* Presents many examples demonstrating the application of the techniquesAn indispensable resource for professional engineers, researchers and PhD
