1. Record Nr. UNINA9910143226703321

Autore	Cherniakov Mikhail
Titolo	An introduction to parametric digital filters and oscillators [[electronic resource] /] / Mikhail Cherniakov
Pubbl/distr/stampa	Chichester, : Wiley, c2003
ISBN	1-280-27219-8 9786610272198 0-470-29977-0 0-470-86824-4 0-470-86825-2
Descrizione fisica	1 online resource (263 p.)
Disciplina	621.3815 621.3815/324 621.3815324
Soggetti	Electric filters, Digital Oscillators, Electric Parametric devices Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
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 Function2.4 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 Systems3.1 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 Summary3.10 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