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Autore	Takács, Lajos
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1.4 Digital Signal Processing Applications; 1.5 Summary; References; Chapter 2: Signal Sampling and Quantization; Objectives; 2.1 Sampling of Continuous Signal; 2.2.2 Practical Considerations for Signal Reconstruction: Anti-Image Filter and Equalizer; 2.3 Analog-to-Digital Conversion, Digital-to-Analog Conversion, and Quantization; 2.4 Summary; 2.5 MATLAB Programs; 2.6 Problems
ReferencesChapter 3: Digital Signals and Systems; Objectives; 3.1 Digital Signals; 3.1.2 Generation of Digital Signals; 3.2.2 Time Invariance; 3.2.3 Causality; 3.3 Difference Equations and Impulse Responses; 3.3.1 Format of Difference Equation; 3.4 Bounded-in-and-Bounded-out Stability; 3.5 Digital Convolution; 3.6 Summary; 3.7 Problems; Chapter 4: Discrete Fourier Transform and Signal Spectrum; Objectives; 4.1 Discrete Fourier Transform; 4.2 Amplitude Spectrum and Power Spectrum; 4.5.1 Method of Decimation-in-Frequency; 4.6 Summary; 4.7 Problems; References; Chapter 5: The z-Transform Objectives5.1 Definition; 5.2 Properties of the z-Transform; 5.3 Inverse z-Transform; 5.3.1 Partial Fraction Expansion Using MATLAB; 5.4 Solution of Difference Equations Using the z-Transform; 5.5 Summary; 5.6 Problems; Reference; Chapter 6: Digital Signal Processing Systems, Basic Filtering Types, and Digital Filter Realizations; Objectives; 6.1 The Difference Equation and Digital Filtering; 6.2 Difference Equation and Transfer Function; 6.2.1 Impulse Response, Step Response, and System Response; 6.3 The z-Plane Pole-Zero Plot and Stability; 6.6 Realization of Digital Filters
6.6.1 Direct-Form I Realization6.7 Application: Speech Enhancement and Filtering; 6.7.1 Pre-Emphasis of Speech; 6.7.2 Bandpass Filtering of Speech; 6.8 Summary; 6.9 Problems; Reference; Chapter 7: Finite Impulse Response Filter Design; Objectives; 7.1 Finite Impulse Response Filter Format; 7.3 Window Method; 7.4.3 Two-Band Digital Crossover; 7.7 Realization Structures of Finite Impulse Response Filters; 7.7.1 Transversal Form; 7.7.2 Linear Phase Form; 7.9 Summary of Finite Impulse Response (FIR) Design Procedures and Selection of FIR Filter Design Methods in Practice; 7.11 MATLAB Programs
7.12 ProblemsReferences; Chapter 8: Infinite Impulse Response Filter Design; Objectives; 8.1 Infinite Impulse Response Filter Format; 8.2.2 Bilinear Transformation and Frequency Warping; 8.2.3 Bilinear Transformation Design Procedure; 8.3 Digital Butterworth and Chebyshev Filter Designs; 8.3.1 Lowpass Prototype Function and Its Order; 8.3.3 Bandpass and Bandstop Filter Design Examples; 8.5 Application: Digital Audio Equalizer; 8.6 Impulse Invariant Design Method; 8.7.2 Second-Order Bandstop (Notch) Filter Design; 8.8 Realization Structures of Infinite Impulse Response Filters
8.8.1 Realization of Infinite Impulse Response Filters in Direct-Form I and Direct-Form II

Sommario/riassunto

This book will enable electrical engineers and technicians in the fields of the biomedical, computer, and electronics engineering, to master the essential fundamentals of DSP principles and practice. Coverage includes DSP principles, applications, and hardware issues with an emphasis on applications. Many instructive worked examples are used to illustrate the material and the use of mathematics is minimized for easier grasp of concepts.In addition to introducing commercial DSP hardware and software, and industry standards that apply to DSP concepts and algorithms, topics covered include ad