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Nota di contenuto	Front Cover; Nonlinear Digital Filters; Copyright Page; Contents; Preface; Chapter 1 Introduction; Why are digital filters associated with nonlinearities?; Challenges for the analysis and design of digital filters associated with nonlinearities; An overview; Chapter 2 Reviews; Mathematical preliminary; Backgrounds on signals and systems; Backgrounds on sampling theorem; Backgrounds on bifurcation theorem; Absolute stability theorem; Exercises; Chapter 3 Quantization in Digital Filters; Model of quantizer; Quantization noise analysis; Optimal code design; Summary; Exercises Chapter 4 Saturation in Digital Filters System model; Oscillations of digital filters associated with saturation nonlinearity; Stability of oscillations of digital filters associated with saturation nonlinearity; Summary; Exercises; Chapter 5 Autonomous Response of Digital Filters with Two's Complement Arithmetic; System model; Linear and affine linear behaviors; Limit cycle behavior; Chaotic behavior; Summary; Exercises; Chapter 6 Step Response of Digital Filters with Two's Complement Arithmetic; Affine linear behavior; Limit cycle behavior; Fractal behavior; Summary; Exercises Chapter 7 Sinusoidal Response of Digital Filters with Two's Complement Arithmetic No overflow case; Overflow case; Summary; Exercises; Chapter 8 Two's Complement Arithmetic in Complex Digital

Filters; First order complex digital filters; Second order complex digital filters; Summary; Exercises; Chapter 9 Quantization and Two's Complement Arithmetic in Digital Filters; Nonlinear behavioral differences of finite and infinite state machines; Nonlinear behavior of unstable second order digital filters; Nonlinear behaviors of digital filters with arbitrary orders and initial conditions; Summary Exercises Chapter 10 Properties and Applications of Digital Filters with Nonlinearities; Admissibility of symbolic sequences; Statistical property; Computer cryptography via digital filters associated with nonlinearities; Summary; Exercises; Further Reading; Index;

Sommario/riassunto

This book provides an easy to understand overview of nonlinear behavior in digital filters, showing how it can be utilized or avoided when operating nonlinear digital filters. It gives techniques for analyzing discrete-time systems with discontinuous linearity, enabling the analysis of other nonlinear discrete-time systems, such as sigma delta modulators, digital phase lock loops and turbo coders. Features: Uses new methods based on symbolic dynamics, enabling the engineer more easily to operate reliable nonlinear digital filters Gives practical, 'real-world' applications of
