Digital signal processing [a practical guide for engineers and scientists /

Smith, Steven W.

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Electronic books

Monografía

In addition to its thorough coverage of DSP design and programming techniques, Smith also covers the operation and usage of DSP chips. He uses Analog Devices" popular DSP chip family as design examples. Also included on the companion website is technical info on DSP processors from the four major manufacturers (Analog Devices, Texas Instruments, Motorola, and Lucent) and other DSP software.

*Covers all major DSP topics
*Full of insider information and shortcuts
*Basic techniques and algorithms explained without complex numbers

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Contenido: Cover; Frontmatter; Half Title Page; Title Page; Copyright; Contents at A Glance; Table of Contents; Preface; Chapter 1. The Breadth and Depth of DSP; The Roots of DSP; Telecommunications; Audio Processing; Echo Location; Image Processing; Chapter 2. Statistics, Probability and Noise; Signal and Graph Terminology; Mean and Standard Deviation; Signal vs. Underlying Process; The Histogram, Pmf and Pdf; The Normal Distribution; Digital Noise Generation; Precision and Accuracy; Chapter 3. ADC and DAC; Quantization; The Sampling Theorem; Digital-to-Analog Conversion Analog Filters for Data ConversionSelecting the Antialias Filter; Multirate Data Conversion; Single-Bit Data Conversion; Chapter 4. DSP Software; Computer Numbers; Fixed Point (Integers); Floating Point (Real Numbers); Number Precision; Execution Speed: Program Language; Execution Speed: Hardware; Execution Speed: Programming Tips; Chapter 5. Linear Systems; Signals and Systems; Requirements for Linearity; Static Linearity and Sinusoidal Fidelity; Examples of Linear and Nonlinear Systems; Special Properties of Linearity; Superposition: The Foundation of DSP; Common Decompositions

Alternatives to LinearityChapter 6. Convolution; The Delta Function and Impulse Response; Convolution; The Input Side Algorithm; The Output Side Algorithm; The Sum of Weighted Inputs; Chapter 7. Properties of Convolution; Common Impulse Responses; Mathematical Properties; Correlation; Speed; Chapter 8. The Discrete Fourier Transform; The Family of Fourier Transform; Notation and Format of the Real DFT; The Frequency Domain"s Independent Variable; DFT Basis Functions; Synthesis, Calculating the Inverse DFT; Analysis, Calculating the DFT; Duality; Polar Notation; Polar Nuisances Chapter 9. Applications of the DFTSpectral Analysis of Signals; Frequency Response of Systems; Convolution via the Frequency Domain; Chapter 10. Fourier Transform Properties; Linearity of the Fourier Transform; Characteristics of the Phase; Periodic Nature of the DFT; Compression and Expansion, Multirate Methods; Multiplying Signals (Amplitude Modulation); The Discrete Time Fourier Transform; Parseval"s Relation; Chapter 11. Fourier Transform Pairs; Delta Function Pairs; The Sinc Function; Other Transform Pairs; Gibbs Effect; Harmonics; Chirp Signals; Chapter 12. The Fast Fourier Transform Real DFT Using the Complex DFTHow the FFT Works; FFT Programs; Speed and Precision Comparisons; Further Speed Increases; Chapter 13. Continuous Signal Processing; The Delta Function; Convolution; The Fourier Transform; The Fourier Series; Chapter 14. Introduction to Digital Filters; Filter Basics; How Information Is Represented in Signals; Time Domain Parameters; Frequency Domain Parameters; High-Pass, Band-Pass and Band-Reject Filters; Filter Classification; Chapter 15. Moving Average Filters; Implementation by ConvoIution; Noise Reduction vs. Step Response; Frequency Response Relatives of the Moving Average Filter

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