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Nota di contenuto	Front cover; Title page; Table of Contents; Acknowledgments; Introduction: Why Use a DSP?; What is Digital Signal Processing; 1 Introduction to Digital Signal Processing; A Brief History of Digital Signal Processing; Advantages of DSP; DSP Systems; Analog-to-Digital Conversion; Digital-to-Analog Conversion; Applications for DSPs; Low-Cost DSP Applications; Power Efficient DSP Applications; High Performance DSP Applications; Conclusion; References; Introduction; Real-Time Systems; 2 Overview of Embedded Systems and Real-Time Systems; Hard Real-Time and Soft Real-Time Systems DSP Systems are Hard Real-TimeEfficient Execution and the Execution Environment; Challenges in Real-Time System Design; Response Time; Recovering from Failures; Distributed and Multiprocessor Architectures; Embedded Systems; Summary; Embedded Systems; 3 Overview of Embedded Systems Development Life Cycle Using DSP; The Embedded System Life Cycle Using DSP; Step 1-Examine the Overall Needs of the System; Step 2-Select the Hardware Components Required for the System; Hardware Gates; Software-Programmable; General-Purpose

Processors; Microcontrollers; FPGA Solutions; Digital Signal Processors
A General Signal Processing Solution DSP Acceleration Decisions; Step
3-Understand DSP Basics and Architecture; Models of DSP Processing;
Input/Output Options; Calculating DSP Performance; DSP Software; DSP
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Sample Rate and Processor Speed; A to D Converters; Digital-to-Analog
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to Filters; Summary of Filter Types
Finite Impulse Response (FIR) Filters FIR Filters as Moving Averages; A
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Diagram); Basic Software Implementation; FIR Filter Characteristics;
Adaptive FIR Filter; Designing and Implementing FIRs Filters; Basic FIR
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Response Filters; IIR As a Difference Equation; IIR As a Transfer
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Specialized Instructions and Address Modes; Circular Addressing
Bit-Reversed Addressing

Sommario/riassunto

Today's embedded and real-time systems contain a mix of processor types: off-the-shelf microcontrollers, digital signal processors (DSPs), and custom processors. The decreasing cost of DSPs has made these sophisticated chips very attractive for a number of embedded and real-time applications, including automotive, telecommunications, medical imaging, and many others-including even some games and home appliances. However, developing embedded and real-time DSP applications is a complex task influenced by many parameters and issues. This introduction to DSP software development for embedd
