Advances in VLSI, Signal Processing, Power Electronics, IoT, Communication and Embedded Systems, Shubhakar Kalya 2021-05-12 This book comprises select peer-reviewed papers from the International Conference on VLSI, Signal Processing, Power Electronics, IoT, Communication and Embedded Systems (VSPICE-2020). The book provides insights into various aspects of the emerging fields in the areas Electronics and Communication Engineering as a holistic approach. The various topics covered in this book include VLSI, embedded systems, signal processing, communication, power electronics and internet of things. This book mainly focuses on the most recent innovations, trends, concerns and practical challenges and their solutions. This book will be useful for academicians, professionals and researchers in the area of electronics and communications and electrical engineering.

Modern Signal Processing, Thomas Kallath 1986-08

VLSI Systems Design for Digital Signal Processing, B. A. Bowen 1985

ARCHITECTURES FOR DIGITAL SIGNAL PROCESSING, Peter Pirsch 2009-08-01 About The Book: This book fuses signal processing algorithms and VLSI circuit design to assist digital signal processing architecture developers. The author then shows how this technique can be used in applications such as signal transmission and storage, manufacturing process quality control and assurance, autonomous mobile system control and biomedical process analysis. This new publication is a revised and expanded version.

Digital Signal Processing in Communications Systems, Marvin Freking 2013-03-14 An engineer's introduction to concepts, algorithms, and advancements in Digital Signal Processing. This lucidly written resource makes extensive use of real-world examples as it covers all the important design and engineering references.

Digital Filters Using MATLAB, Lars Wanhammar 2020-02-18 This textbook provides comprehensive coverage for courses in the basics of design and implementation of digital filters. The book assumes only basic knowledge in digital signal processing and covers state-of-the-art methods for digital filter design and provides a simple route for the readers to design their own filters. The advanced mathematics that is required for the filter design is minimized by providing an extensive MATLAB toolbox with over 300 files. The book presents over 200 design examples with MATLAB code and over 300 problems to be solved by the reader. The students can design and modify the code for their use. The book and the design examples cover almost all known design methods of frequency-selective digital filters as well as some of the authors' own, unique techniques.

Digital Signal Processing, Paulo S. R. Diniz 2002-04-18 Digital signal processing lies at the heart of the communications revolution and is an essential element of key technologies such as mobile phones and the Internet. This book covers all the major topics in digital signal processing (DSP) design and analysis, supported by MATLAB examples and other modelling techniques. The authors explain clearly and concisely why and how to use digital signal processing systems; how to approximate a desired transfer function characteristic using polynomials and ratio of polynomials; why an appropriate mapping of a transfer function onto a suitable structure is important for practical applications; and how to analyse, represent and explore the trade-off between time and frequency representation of signals. An ideal textbook for students, it will also be a useful reference for engineers working on the development of digital signal processing systems.


Digital Signal Processing, K. Deeksha Rao 2018-04-14 The book provides a comprehensive exposition of all major topics in digital signal processing (DSP). With numerous illustrative examples for easy understanding of the topics, it also includes MATLAB-based examples with codes in order to encourage the readers to become more confident of the fundamentals and to gain insights into DSP. Further, it presents real-world signal processing design problems using MATLAB and programmable DSP processors. In addition to problems that require analytical solutions, it discusses problems that require solutions using MATLAB at the end of each chapter. Divided into 13 chapters, it addresses many emerging topics, which are not typically found in advanced texts on DSP. It includes a chapter on adaptive digital filters used in the signal processing problems for faster acceptable results in the presence of changing environments and changing system requirements. Moreover, it offers an overview of wavelets, enabling readers to easily understand the basics and applications of this powerful mathematical tool for signal and image processing. The final chapter explores DSP processors, which is an area of growing interest for researchers. A valuable resource for undergraduate and graduate students, it can also be used for self-study by researchers, practicing engineers and scientists in electronics, communications, and computer engineering as well as for teaching one- to two-semester courses.

VLSI Design Methodologies for Digital Signal Processing, Magdy A. Bayoumi 2012-12-06 Designing VLSI systems represents a challenging task. It is a transformation among different specifications corresponding to different levels of design: abstraction, behavioral, structural and physical. The behavioral level describes the functionality of the design. It consists of two components: static and dynamic. The static component describes operations, whereas the dynamic component describes sequencing and timing. The structural level contains information about components, control and connectivity. The physical level describes the constraints that should be imposed on the floor plan, the placement of components, and the geometry of the design. Constraints of area, speed and power are also applied at this level. To implement such multilevel transformation, a design methodology should be devised, taking into consideration the constraints, limitations and properties of each level. The mapping process between any of these domains is non-isomorphic. A single behavioral component may be transformed into more than one structural component. Design methodologies are the most recent evolution in the design automation era, which started off with the introduction and subsequent usage of module generation especially for regular structures such as PLA’s and memories. A design methodology should offer an integrated design system rather than a set of separate unrelated routines and tools. A general outline of a desired integrated design system is as follows: * Decide on a certain unified framework for all design levels. * Derive a design method based on this framework. * Create a design environment to implement this design method.


Real-time Signal Processing, John G. Ackelson 1999 PLEASE PROVIDE COURSE INFORMATION PLEASE PROVIDE

VLSI Digital Signal Processing Systems Design And Implementation

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Our books collection hosts in multiple countries, allowing you to get the most less latency time to download any of our books like this one. Merely said, the VLSI digital signal processing systems design and implementation is universally compatible with any devices to read signal processing systems.
VLSI DIGITAL SIGNAL PROCESSING SYSTEMS: DESIGN AND IMPLEMENTATION

Keshab K. Parhi 2007-01-01 Market_Desc: Students in graduate level courses: Electrical Engineers, Computer Scientists, Computer Architecture Designers; Circuit Designers; Algorithm Designers; System Designers; Computer Programmers in the Multimedia and Wireless Communications Industries; VLSI System Designers. Special Features: This example-packed resource provides invaluable professional training for a rapidly-expanding industry. * Presents a variety of approaches to analysis, estimation, and reduction of power consumption in order to help designers extend battery life. * Includes application-driven problems at the end of each chapter: Features six appendices covering shortest path algorithms used in retiming, scheduling, and allocation techniques, as well as determining the iteration bound. * Presents common features of digital-oriented design systems. * Describes procedures, and tools used by each. In a thorough and systematic manner, the graduate level textbook will fill an important niche in a rapidly expanding market.

Mixed-Signal Systems

Andrzej Handkiewicz 2002-08-08 A practical guide to the successful integration of digital and analog circuits Mixed-signal processing—the integration of digital and analog circuits within computer systems—enables systems to take signals from the analog world and process them within a digital system. In fact, recent advances in VLSI technology performance now allow for the integration of digital and analog circuits on a single chip, a process that requires the use of analog pre- and post-processing systems such as converters, filters, sensors, drivers, buffers, and actuators. However, the lack of universal CAD tools for the synthesis, simulation, and layout of the analog part of the chip represents a design bottleneck of today's VLSI circuits. Mixed-Signal Systems: A Guide to CMOS Circuit Design presents a comprehensive general overview of the latest CMOS technology and covers the various computer systems that may be used for designing integrated circuits. Taking an original approach to one- and two-dimensional filter design, the author explores the many digital-oriented design systems, or silicon compilers, currently being used, and presents the basic methods, procedures, and tools used by each. In a thorough and systematic manner, the text: * Presents common features of digital-oriented design systems. * Describes methods and tools that are not yet being applied in any compiler. * Illustrates image processing systems that can be implemented on a single chip. * Demonstrates the path from synthesis techniques to the actual silicon assembly. Essential reading for integrated circuit designers and developers of related computer programs, as well as advanced students of system design, this book represents an invaluable resource for anyone involved in the development of mixed-signal systems.

VLSI and Modern Signal Processing

Sun. Yuan Kung 1985

VLSI Systems Design for Digital Signal Processing

B. A. Bowen 1982

VLSI Architecture

Brian Randell 1983

VLSI Synthesis of DSP Kernels

Mahesh Mehendale 2013-04-17 A critical step in the design of a DSP system is to identify for each of its components an implementation architecture that provides the desired degree of flexibility/programmability and optimises the area-delay-power parameters. This essential book covers architectures that offer varying degrees of programmability.

VLSI Systems Design for Digital Signal Processing: Systems Design

B. A. Bowen 1982

VLSI Digital Signal Processors

Vijay Madisetti 1995 This is the only book that offers a thorough treatment of the following: design and application of programmable digital signal processors; formal specification and optimization of signal processing architectures and circuits; high-level synthesis of DSP architectures and datapaths; detailed treatment of application-specific integrated circuits (ASICs); scheduling, allocation and assignment algorithms for multiple processor DSP systems; and hardware/software co-design issues in DSP. VLSI Digital Signal Processors: An Introduction to Rapid Prototyping and Design Synthesis provides a cohesive, quantitative and clear exposition of the implementation and prototyping of digital signal processing algorithms on programmable signal processors, parallel processing systems and application-specific ICs. Included are both programmable and dedicated digital signal processors, and discussions of the latest optimization methods and the use of computer-aided-design techniques.

VLSI Design

Vikram Arulkil Candraasety 2011-08-23 This book provides insight into the practical design of VLSI circuits. It is aimed at novice VLSI designers and other enthusiasts who would like to understand VLSI design flows. Coverage includes key concepts in CMOS digital design, design of DSP and communication blocks on FPGAs,ASIC front end and physical design, and analog and mixed signal design. The approach is designed to focus on practical implementation of key elements of the VLSI design process, in order to make the topic accessible to novices. The design concepts are demonstrated using software from Mathworks, Xilinx, Mentor Graphics, Synopsys and Cadence.

Top-Down Digital VLSI Design

Hubert Kaeslin 2014-12-04 Top-Down VLSI Design: From Architectures to Gate-Level Circuits and FPGAs represents a unique approach to learning digital design. Developed from more than 20 years teaching circuit design, Doctor Kaeslin’s approach follows the natural VLSI design flow and makes circuit design accessible for professionals with a background in systems engineering or digital signal processing. It begins with hardware architecture and promotes a system-level view, first considering the type of intended application and letting that guide your design choices. Doctor Kaeslin presents modern considerations for handling circuit complexity, throughput, and energy efficiency while preserving functionality. The book focuses on application-specific integrated circuits (ASICs), which along with FPGAs are increasingly used to develop products with applications in telecommunications, IT security, biomedical, automotive, and computer vision industries. Topics include field-programmable logic algorithms, verification, modeling hardware, synchronous clocking, and more. Demonstrates a top-down approach to digital VLSI design. Provides a systematic overview of architecture optimization techniques. Features a chapter on field-programmable logic devices, their technologies and architectures. Includes checklists, hints, and warnings for various design situations. Emphasizes design flows that do not overlook important action items and which include alternative options when planning the development of microelectronic circuits.

Analog VLSI Integration of Massive Parallel Signal Processing Systems

Peter Kinget 2013-06-29 When comparing conventional computing architectures to the architectures of biological neural systems, we find several striking differences. Conventional computers use a low number of high performance computing elements that are programmed with algorithms to perform tasks in a time sequenced way; they are very successful in administrative applications, in scientific simulations, and in certain signal processing applications. However, the biological systems still significantly outperform conventional computers in perception tasks, sensory data processing and motory control. Biological systems use a completely different computing paradigm: a massive network of simple processors that are (adaptively) interconnected and operate in parallel. Exactly this massively parallel processing seems the key aspect to their success. On the other hand the development of VLSI technologies provide us with technological means to implement very complicated systems on a silicon die. Especially analog VLSI circuits in standard digital technologies open the way for the implementation at ion of massively parallel analog signal processing systems for sensory signal processing applications and for perception tasks. In chapter 1 the motivations...
behind the emergence of the analog VLSI of massively parallel systems is
discussed in detail together with the capabilities and limitations of VLSI
technologies and the required research and developments. Analog parallel
signal processing drives for the development of very com pact, high speed
and low power circuits. An important technologicallimitation in the reduction
of the size of circuits and the improvement of the speed and power
consumption performance is the device inaccuracies or device mismatch.

**Digital Signal Processing with Field Programmable Gate Arrays** Uwe Meyer-
Bäse 2013-03-09 Starts with an overview of today’s FPGA technology,
devices, and tools for designing state-of-the-art DSP systems. A case study
in the first chapter is the basis for more than 30 design examples throughout.
The following chapters deal with computer arithmetic concepts, theory
and the implementation of FIR and IIR filters, multirate digital signal processing
systems, DFT and FFT algorithms, and advanced algorithms with high future
potential. Each chapter contains exercises. The VERILOG source code and
a glossary are given in the appendices, while the accompanying CD-ROM
contains the examples in VHDL and Verilog code as well as the newest Altera
“Baseline” software. This edition has a new chapter on adaptive filters, new
sections on division and floating point arithmetics, an up-date to the current
Altera software, and some new exercises.

Addresses a wide selection of multimedia applications, programmable and
custom architectures for the implementations of multimedia systems, and
arithmetic architectures and design methodologies. The book covers recent
applications of digital signal processing algorithms in multimedia, presents
high-speed and low-priority binary and finite field arithmetic architectures,
details VHDL-based implementation approaches, and more.

**Digital VLSI Systems Design** Seetharaman Ramachandran 2007-06-14 This
book provides step-by-step guidance on how to design VLSI systems using
Verilog. It shows the way to design systems that are device, vendor and
technology independent. Coverage presents new material and theory as well
as synthesis of recent work with complete Project Designs using industry
standard CAD tools and FPGA boards. The reader is taken step by step
through different designs, from implementing a single digital gate to a
massive design consuming well over 100,000 gates. All the design codes
developed in this book are Register Transfer Level (RTL) compliant and can
be readily used or amended to suit new projects.

**Circuits, Signals, and Speech and Image Processing** Richard C. Dorf 2018-10-03
In two editions spanning more than a decade, The Electrical Engineering
Handbook stands as the definitive reference to the multidisciplinary field of
electrical engineering. Our knowledge continues to grow, and so does the
Handbook. For the third edition, it has expanded into a set of six books
carefully focused on a specialized area or field of study. Each book represents
a concise yet definitive collection of key concepts, models, and equations in its
respective domain, thoughtfully gathered for convenient access. Circuits,
Signals, and Speech and Image Processing presents all of the basic information
related to electric circuits and components, analysis of circuits, the use of
the Laplace transform, as well as signal, speech, and image processing using filters
and algorithms. It also examines emerging areas such as text-to-speech
synthesis, real-time processing, and embedded signal processing. Each article
includes defining terms, references, and sources of further information.
Encompassing the work of the world’s foremost experts in their respective
specialties, Circuits, Signals, and Speech and Image Processing features the
latest developments, the broadest scope of coverage, and new material on
biometrics.

**Multicore DSP** Naim Dahnoun 2018-02-12 The only book to offer special
coverage of the fundamentals of multicore DSP for implementation on the
TMS320C66xx SoC. This unique book provides readers with an understanding
of the TMS320C66xx SoC as well as its constraints. It offers critical analysis of
the functionality of this processor and have an understanding of the rich content
which spans from architecture, development tools and programming models,
such as OpenCL and OpenMP, to debugging tools. It also covers various
multicore audio and image applications in detail. Additionally, this one-of-a-
kind book is supplemented with: A rich set of tested laboratory exercises and
solutions Audio and Image processing applications source code for the Code
Composer Studio (integrated development environment from Texas
Instruments) Multiple tables and illustrations With no other book on the
market offering any coverage at all on the subject and its rich content with
twenty chapters, Multicore DSP: From Algorithms to Real-time
Implementation on the TMS320C66x SoC is a rare and much-needed source of
information for undergraduates and postgraduates in the field that allows
them to make real-time applications work in a relatively short period of time.
It is also incredibly beneficial to hardware and software engineers involved in
programming real-time embedded systems.

**VLSI Systems Design for Digital Signal Processing: Signal processing and
signal processors** B. A. Bowen 1982
VLSI Digital Signal Processing Systems Keshab K. Parhi 1999 Digital audio,
speech recognition, cable modems, radar, high-definition television—these are
but a few of the modern computer and communications applications relying
on digital signal processing (DSP) and the attendant application-specific
integrated circuits (ASICs). As information-age industries constantly reinvent
ASIC chips for lower power consumption and higher efficiency, there is a
growing need for designers who are current and fluent in VLSI design
methodologies for DSP. Enter VLSI Digital Signal Processing Systems—a
unique, comprehensive guide to performance optimization techniques in
VLSI signal processing. Based on Keshab Parhi’s highly respected and popular
graduate-level courses, this volume is destined to become the standard text
and reference in the field. This text integrates VLSI architecture theory
and algorithms, addresses various architectures at the implementation level,
and presents several approaches to analysis, estimation, and reduction of power
consumption. Throughout this book, Dr. Parhi explains how to design high-
speed, low-area, and low-power VLSI systems for a broad range of DSP
applications. He covers pipelining extensively as well as numerous other
techniques, from parallel processing to scaling and roundoff noise computation.
Readers are shown how to apply all techniques to improve implementations
of several DSP algorithms, using both ASICs and off-the-shelf programmable
digital signal processors. The book features hundreds of graphs illustrating the
various DSP algorithms, examples based on digital filters and transforms
clarifying key concepts, and interesting end-of-chapter exercises that help
match techniques with applications. In addition, the abundance of readily
available techniques makes this an extremely useful resource for designers of
DSP systems in wired, wireless, or multimedia communications. The material
can be easily adopted in new courses on either VLSI digital signal processing
architectures or high-performance VLSI system design. An invaluable
reference and practical guide to VLSI digital signal processing. A tremendous
source of optimization techniques indispensable in modern VLSI signal
processing, VLSI Digital Signal Processing Systems promises to become the
standard in the field. It offers a rich training ground for students of VLSI
design for digital signal processing and provides immediate access to state-of-
the-art, proven techniques for designers of DSP applications— in wired,
wireless, or multimedia communications. Topics include: * Transformations
for high speed using pipelining, retiming, and parallel processing techniques *
Power reduction transformations for supply voltage reduction as well as for
strength or capacitance reduction * Area reduction using folding techniques *
Strategies for arithmetic implementation * Synchronous, wave, and
asynchronous pipelining * Design of programmable DSPs. An Instructor’s
Manual presenting detailed solutions to all the problems in the book is
available from the Wiley editorial department.

**Digital Design of Signal Processing Systems** Shoab Ahmed Khan 2011-02-02
Digital Design of Signal Processing Systems discusses a spectrum of
architectures and methods for effective implementation of algorithms in
hardware (HW). Encompassing all facets of the subject this book includes
conversion of algorithms from floating-point to fixed-point format, parallel
architectures for basic computational blocks, Verilog Hardware Description Language (HDL), SystemVerilog and coding guidelines for synthesis. The book also covers system level design of Multi Processor System on Chip (MPSoC); a consideration of different design methodologies including Network on Chip (NoC) and Kahn Process Network (KPN) based connectivity among processing elements. A special emphasis is placed on implementing streaming applications like a digital communication system in HW. Several novel architectures for implementing commonly used algorithms in signal processing are also revealed. With a comprehensive coverage of topics the book provides an appropriate mix of examples to illustrate the design methodology. Key Features: A practical guide to designing efficient digital systems, covering the complete spectrum of digital design from a digital signal processing perspective Provides a full account of HW building blocks and their architectures, while also elaborating effective use of embedded computational resources such as multipliers, adders and memories in FPGAs Covers a system level architecture using NoC and KPN for streaming applications, giving examples of structuring MATLAB code and its easy mapping in HW for these applications Explains state machine based and Micro-Program architectures with comprehensive case studies for mapping complex applications The techniques and examples discussed in this book are used in the award winning products from the Center for Advanced Research in Engineering (CARE). Software Defined Radio, 10 Gigabit VoIP monitoring system and Digital Surveillance equipment has respectively won APICTA (Asia Pacific Information and Communication Alliance) awards in 2010 for their unique and effective designs.

DSP Integrated Circuits, Lars Wanhammar 1999-02-24 DSP Integrated Circuits establishes the essential interface between theory of digital signal processing algorithms and their implementation in full-custom CMOS technology. With an emphasis on techniques for co-design of DSP algorithms and hardware in order to achieve high performance in terms of throughput, low power consumption, and design effort, this book provides the professional engineer, researcher, and student with a firm foundation in the theoretical as well as the practical aspects of designing high performance DSP integrated circuits. Centered around three design case studies, DSP Integrated Circuits thoroughly details a high-performance FFT processor, a 2-D Discrete Cosine Transform for HDTV, and a wave digital filter for interpolation of the sampling frequency. The case studies cover the essential parts of the design process in a top-down manner, from specification of algorithm design and optimization, scheduling of operations, synthesis of optimal architectures, realization of processing elements, to the floor-planning of the integrated circuit. Details the theory and design of digital filters - particularly wave digital filters, multi-rate digital filters, fast Fourier transforms (FFT’s), and discrete cosine transforms (DCT’s) Follows three complete "real-world" case studies throughout the book Provides complete coverage of finite word length effects in DSP algorithms In-depth survey of the computational properties of DSP algorithms and their mapping to optimal architectures Outlines DSP architectures and parallel, bit-serial, and distributed arithmetic Presents the design process in a top-down manner and incorporates numerous problems and solutions

VLSI DIGITAL SIGNAL PROCESSING SYSTEMS: DESIGN AND IMPLEMENTATION Keshab K. Parhi 2007 Market_Desc: Students in graduate level courses Electrical Engineers Computer Scientists Computer Architecture Designers Circuit Designers Algorithm Designers System Designers Computer Programmers in the Multimedia and Wireless Communications Industries VLSI System Designers Special Features: This example-packed resource provides invaluable professional training for a rapidly-expanding industry. Presents a variety of approaches to analysis, estimation, and reduction of power consumption in order to help designers extend battery life. Includes application-driven problems at the end of each chapter Features six appendices covering shortest path algorithms used in retiming, scheduling, and allocation techniques, as well as determining the iteration bound The Author is a recognized expert in the field, having written several books, taught several graduate-level classes, and served on several IEEE boards About The Book: This book complements the other Digital Signaling Processing books in our list, which include an introductory treatment (Marven), a comprehensive handbook (Mitra), a professional reference (Kaloupsidis), and others which pertain to a specific topic such as noise control. This graduate level textbook will fill an important niche in a rapidly expanding market.

High-Performance VLSI Signal Processing Innovative Architectures and Algorithms, Algorithms and Architectures H. J. Ray Liu 1998 Electrical Engineering/Signal Processing High—Performance VLSI Signal Processing Innovative Architectures and Algorithms Volume 1 Algorithms and Architectures The first volume in a two-volume set, High-Performance VLSI Signal Processing: Innovative Architectures and Algorithms brings together the most innovative papers in the field, focused introductory material, and extensive references. The editors present timely coverage of algorithm and design methodologies with an emphasis on today's rapidly-evolving high-speed architectures for VLSI implementations. These volumes will serve as vital resources for engineers who want a comprehensive knowledge of the extremely interdisciplinary field of high-performance VLSI processing. The editors provide a practical understanding of the merits of total system design through an insightful, synergistic presentation of methodology, architecture, and infrastructure. Each volume features: Major papers that span the entire range of research areas in the field Chapter introductions, including historical perspectives Numerous applications-oriented design examples Coverage of current and future technological trends Throughout treatment of high-speed architectures

Digital Signal Processing and the Microcontroller Dale Grover 1999 8134H-5 The friendly, intuitive approach to microcontroller-based DSP. If you actually want to process signals -- not just theorize about digital signal processing -- this is the book for you. It's a friendly, informal guide to understanding -- and implementing -- digital signal processing with microcontrollers. You'll find enough theory to keep you on track (and a brief refresher on the basic math you'll need -- with no calculators!) But the focus is on real-world applications, especially specifying, designing, and implementing digital filters, and using fast Fourier transform. Coverage includes: The big picture: What DSP can and cannot do. Analog systems, signals and filters. Discrete-time signals and systems. FIR and IIR filters. Microcontroller filter implementation. Frequency analysis, correlation, sampling and signal synthesis. Digital Signal Processing and the Microcontroller includes extensive examples and assembler code based on Motorola's powerful 16-bit M68HC16 microcontroller -- and expert DSP insights you can use with any processor. Whether you have a formal electrical engineering background or not, it's all you need to get results with DSP fast. The accompanying website contains extensive source code for the MC68HC16 microcontroller, including assembler code for DSP filters and other applications; a complete set of MC68HC16 documentation in PDF format; MATLAB m-files for selected examples, and more.

VLSI Signal Processing Technology Magdy A. Bayoumi 2012-12-06 This book is the first in a set of forthcoming books focused on state-of-the-art development in the VLSI Signal Processing area. It is a response to the tremendous research activities taking place in that field. These activities have been driven by two factors: the dramatic increase in demand for high speed signal processing, especially in consumer electronics and the evolving microelectronic technologies. The available technology has always been one of the main factors in determining algorithms, architectures, and design strategies to be followed. With every new technology, signal processing systems go through many changes in concepts, design methods, and implementation. The goal of this book is to introduce the reader to the main features of VLSI Signal Processing and the ongoing developments in this area. The focus of this book is on: • Current developments in Digital Signal Processing (DSP) pro cessors and architectures - several examples and case studies of existing DSP chips are discussed in Chapter 1. • Features and requirements of image and video signal processing architectures - both applications specific integrated circuits (ASICs) and programmable image processors are studied in Chapter 2. • New market areas for signal processing - especially in consumer electronics such as multimedia, teleconferencing, and movie on demand. • Impact of arithmetic circuitry on the performance of DSP
processors - several topics are discussed in Chapter 3 such as: number representation, arithmetic algorithms and circuits, and implementation.

**Digital Signal Processing in VLSI** Richard J. Higgins 1990

**Architectures for Computer Vision** Hong Jeong 2014-08-05 This book provides comprehensive coverage of 3D vision systems, from vision models and state-of-the-art algorithms to their hardware architectures for implementation on DSPs, FPGA and ASIC chips, and GPUs. It aims to fill the gaps between computer vision algorithms and real-time digital circuit implementations, especially with Verilog HDL design. The organization of this book is vision and hardware module directed, based on Verilog vision modules, 3D vision modules, parallel vision architectures, and Verilog designs for the stereo matching system with various parallel architectures. Provides Verilog vision simulators, tailored to the design and testing of general vision chips Bridges the differences between C/C++ and HDL to encompass both software realization and chip implementation; includes numerous examples that realize vision algorithms and general vision processing in HDL. Unique in providing an organized and complete overview of how a real-time 3D vision system-on-chip can be designed Focuses on the digital VLSI aspects and implementation of digital signal processing tasks on hardware platforms such as ASICs and FPGAs for 3D vision systems, which have not been comprehensively covered in one single book Provides a timely view of the pervasive use of vision systems and the challenges of fusing information from different vision modules Accompanying website includes software and HDL code packages to enhance further learning and develop advanced systems A solution set and lecture slides are provided on the book’s companion website The book is aimed at graduate students and researchers in computer vision and embedded systems, as well as chip and FPGA designers. Senior undergraduate students specializing in VLSI design or computer vision will also find the book to be helpful in understanding advanced applications.

**Design Recipes for FPGAs: Using Verilog and VHDL** Peter Wilson 2011-02-24 Design Recipes for FPGAs: Using Verilog and VHDL provides a rich toolbox of design techniques and templates to solve practical, every-day problems using FPGAs. Using a modular structure, the book gives ‘easy-to-find’ design techniques and templates at all levels, together with functional code. Written in an informal and ‘easy-to-grasp’ style, it goes beyond the principles of FPGA s and hardware description languages to actually demonstrate how specific designs can be synthesized, simulated and downloaded onto an FPGA. This book’s ‘easy-to-find’ structure begins with a design application to demonstrate the key building blocks of FPGA design and how to connect them, enabling the experienced FPGA designer to quickly select the right design for their application, while providing the less experienced a ‘road map’ to solving their specific design problem. The book also provides advanced techniques to create ‘real world’ designs that fit the device required and which are fast and reliable to implement. This text will appeal to FPGA designers of all levels of experience. It is also an ideal resource for embedded system development engineers, hardware and software engineers, and undergraduates and postgraduates studying an embedded system which focuses on FPGA design. A rich toolbox of practical FPGA design techniques at an engineer's finger tips Easy-to-find structure that allows the engineer to quickly locate the information to solve their FPGA design problem, and obtain the level of detail and understanding needed