Digital Integrated Circuits Jan Rabaey Solution Manual

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Berkshire Encyclopedia of Sustainability 7/10 - Ray C. Anderson 2012-11-01 China, India, and East and Southeast Asia: Assessing Sustainability provides unprecedented analyses by regional experts and scholars elsewhere in the world on China, India, and their neighbors. Despite growing demands internally on their natural resources (China and India alone are home to more than one-third of the world's population), the expanding global economic influence of this region makes these countries vital players in a sustainable future for all citizens of the Earth. Regional coverage includes topics such as business and commerce, environmental and corporate law, and lifestyles and values.

Analysis and Design of Digital Integrated Circuits - David A. Hodges 2003 The third edition of Hodges and Jackson's Analysis and Design of Digital Integrated Circuits has been thoroughly revised and updated by a new co-author, Resve Saleh of the University of British Columbia. The new edition combines the approachability and concise nature of the Hodges and Jackson classic with a complete overhaul to bring the book into the 21st century. The new edition has replaced the emphasis on BiPolar with an emphasis on CMOS. The outdated MOS transistor model used throughout the book will be replaced with the now standard deep submicron model. The material on memory has been expanded and updated. As well the book now includes more on SPICE simulation and new problems that reflect recent technologies. The emphasis of the book is on design, but it does not neglect analysis and has as a goal to provide enough information so that a student can carry out analysis as well as be able to design a circuit. This book provides an excellent and balanced introduction to digital circuit design for both students and professionals.

Binary Decision Diagrams and Applications for VLSI CAD - Shin-ichi Minato 2012-12-06 Symbolic Boolean manipulation using binary decision diagrams (BDDs) has been successfully applied to a wide variety of tasks, particularly in very large scale integration (VLSI) computer-aided design (CAD). The concept of decision graphs as an abstract representation of Boolean functions dates back to the early work by Lee and Akers. In the last ten years, BDDs have found widespread use as a concrete data structure for symbolic Boolean manipulation. With BDDs, functions can be constructed, manipulated, and compared by simple and efficient graph algorithms. Since Boolean functions can represent not just digital circuit functions, but also such mathematical domains as sets and relations, a wide variety of CAD problems can be solved using BDDs. `Binary Decision Diagrams and Applications for VLSI CAD provides valuable information for both those who are new to BDDs as well as to long time aficionados.' -from the Foreword by Randal E. Bryant. `Over the past ten years ... BDDs have attracted the attention of many researchers because of their suitability for representing

Boolean functions. They are now widely used in many practical VLSI CAD systems. ... this book can serve as an introduction to BDD techniques and ... it presents several new ideas on BDDs and their applications. ... many computer scientists and engineers will be interested in this book since Boolean function manipulation is a fundamental technique not only in digital system design but also in exploring various problems in computer science.' - from the Preface by Shin-ichi Minato.

Forthcoming Books - Rose Arny 2003

Brutal - Uday Satpathy 2015

Digital Design: International Version - John F Wakerly 2010-06-18
With over 30 years of experience in both industrial and university settings, the author covers the most widespread logic design practices while building a solid foundation of theoretical and engineering principles for students to use as they go forward in this fast moving field.

14th Symposium on Integrated Circuits and Systems Design - Sociedade Brasileira de Computação 2001
Annotation Papers from a September 2001 symposium report on recent advances in areas of integrated circuits and systems design, including embedded systems, rapid prototyping, formal methods, codesign, CAD and test, analog, digital, and physical design, and low power and low voltage. Specific topics include communication architectures for system-on- chip, using the CAN protocol and reconfigurable computing technology for Web-based smart house automation, and optimizing BBD-based verification analyzing variable dependencies. Other subjects include interconnection length estimation at logic level, an environment to aid the synthesis of threephase analogue waveform using AHDL, and extending sequencing graphs for reconfigurable applications modeling. This work lacks a subject index. c. Book News Inc.
Cryptographic Engineering - Cetin Kaya Koc 2008-12-11
This book is for engineers and researchers working in the embedded hardware industry. This book addresses the design aspects of cryptographic hardware and embedded software. The authors provide tutorial-type material for professional engineers and computer information specialists.

Verilog HDL - Samir Palnitkar 2003
VERILOG HDL, Second Editionby Samir PalnitkarWith a Foreword by Prabhu GoelWritten forboth experienced and new users, this book gives you broad coverage of VerilogHDL. The book stresses the practical design and verification perspective ofVerilog rather than emphasizing only the language aspects. The informationpresented is fully compliant with the IEEE 1364-2001 Verilog HDL standard. Among its many features, this edition-bull; bull;Describes state-of-the-art verification methodologies bull;Provides full coverage of gate, dataflow (RTL), behavioral and switch modeling bull;Introduces you to the Programming Language Interface (PLI) bull;Describes logic synthesis methodologies bull;Explains timing and delay simulation bull;Discusses user-defined primitives bull;Offers many practical modeling tips Includes over 300 illustrations, examples, and exercises, and a Verilog resource list.Learning objectives and summaries are provided for each chapter. About the CD-ROMThe CD-ROM contains a Verilog simulator with agraphical user interface and the source code for the examples in the book. Whatpeople are saying about Verilog HDL-"Mr.Palnitkar illustrates how and why Verilog HDL is used to develop today'smost complex digital designs. This book is valuable to both the novice and theexperienced Verilog user. I highly recommend it to anyone exploring Verilogbased design." -RajeevMadhavan, Chairman and CEO, Magma Design Automation "Thisbook is unique in its breadth of information on Verilog and Verilog-relatedtopics. It is fully compliant with the IEEE 1364-2001 standard, contains allthe information that you need on the basics, and devotes several chapters toadvanced topics such as verification, PLI, synthesis and modelingtechniques." -MichaelMcNamara, Chair, IEEE 1364-2001 Verilog Standards Organization Thishas been my favorite Verilog book since I picked it up in college. It is theonly book that covers practical Verilog. A must have for beginners andexperts." -BerendOzceri, Design Engineer, Cisco Systems, Inc. "Simple,logical and well-organized material with

plenty of illustrations, makes this anideal textbook." -Arun K. Somani, Jerry R. Junkins Chair Professor,Department of Electrical and Computer Engineering, Iowa State University, Ames PRENTICE HALL Professional Technical Reference Upper Saddle River, NJ 07458 www.phptr.com ISBN: 0-13-044911-3

Digital Integrated Circuits - Jan M. Rabaey 1996
Beginning with discussions on the operation of electronic devices and analysis of the nucleus of digital design, the text addresses: the impact of interconnect, design for low power, issues in timing and clocking, design methodologies, and the effect of design automation on the digital design perspective.

Practical Problems in VLSI Physical Design Automation - Sung Kyu Lim 2008-07-31
Practical Problems in VLSI Physical Design Automation contains problems and solutions related to various well-known algorithms used in VLSI physical design automation. Dr. Lim believes that the best way to learn new algorithms is to walk through a small example by hand. This knowledge will greatly help understand, analyze, and improve some of the well-known algorithms. The author has designed and taught a graduate-level course on physical CAD for VLSI at Georgia Tech. Over the years he has written his homework with such a focus and has maintained typeset version of the solutions.

Quick-Turnaround ASIC Design in VHDL - N. Bouden-Romdhane 2012-12-06
From the Foreword..... Modern digital signal processing applications provide a large challenge to the system designer. Algorithms are becoming increasingly complex, and yet they must be realized with tight performance constraints. Nevertheless, these DSP algorithms are often built from many constituent canonical subtasks (e.g., IIR and FIR filters, FFTs) that can be reused in other subtasks. Design is then a problem of composing these core entities into a cohesive whole to provide both the intended functionality and the required performance. In order to organize the design process, there have been two major approaches. The top-down approach starts with an abstract, concise, functional description which can be quickly generated. On the other hand, the bottom-up approach starts from a detailed low-level design

where performance can be directly assessed, but where the requisite design and interface detail take a long time to generate. In this book, the authors show a way to effectively resolve this tension by retaining the high-level conciseness of VHDL while parameterizing it to get good fit to specific applications through reuse of core library components. Since they build on a pre-designed set of core elements, accurate area, speed and power estimates can be percolated to high- level design routines which explore the design space. Results are impressive, and the cost model provided will prove to be very useful. Overall, the authors have provided an up-to-date approach, doing a good job at getting performance out of high-level design. The methodology provided makes good use of extant design tools, and is realistic in terms of the industrial design process. The approach is interesting in its own right, but is also of direct utility, and it will give the existing DSP CAD tools a highly competitive alternative. The techniques described have been developed within ARPAs RASSP (Rapid Prototyping of Application Specific Signal Processors) project, and should be of great interest there, as well as to many industrial designers. Professor Jonathan Allen, Massachusetts Institute of Technology
Modern VLSI Design - Wayne Wolf 2002-01-14
For Electrical Engineering and Computer Engineering courses that cover the design and technology of very large scale integrated (VLSI) circuits and systems. May also be used as a VLSI reference for professional VLSI design engineers, VLSI design managers, and VLSI CAD engineers. Modern VSLI Design provides a comprehensive "bottom-up" guide to the design of VSLI systems, from the physical design of circuits through system architecture with focus on the latest solution for system-on-chip (SOC) design. Because VSLI system designers face a variety of challenges that include high performance, interconnect delays, low power, low cost, and fast design turnaround time, successful designers must understand the entire design process. The Third Edition also provides a much more thorough discussion of hardware description languages, with introduction to both Verilog and VHDL. For that reason, this book presents the entire VSLI design process in a single volume.

Power Aware Design Methodologies - Massoud Pedram 2007-05-08
Power Aware Design Methodologies was conceived as an effort to bring all aspects of power-aware design methodologies together in a single document. It covers several layers of the design hierarchy from technology, circuit logic, and architectural levels up to the system layer. It includes discussion of techniques and methodologies for improving the power efficiency of CMOS circuits (digital and analog), systems on chip, microelectronic systems, wirelessly networked systems of computational nodes and so on. In addition to providing an in-depth analysis of the sources of power dissipation in VLSI circuits and systems and the technology and design trends, this book provides a myriad of state-of-the-art approaches to power optimization and control. The different chapters of Power Aware Design Methodologies have been written by leading researchers and experts in their respective areas. Contributions are from both academia and industry. The contributors have reported the various technologies, methodologies, and techniques in such a way that they are understandable and useful.

The British National Bibliography - Arthur James Wells 1996

Integrated Circuit and System Design. Power and Timing Modeling, Optimization and Simulation - Vassilis Paliouras 2005-08-25
Welcome to the proceedings of PATMOS 2005, the 15th in a series of international workshops.PATMOS2005wasorganizedbyIMECwithtechnicalco-sponsorshipfrom the IEEE Circuits and Systems Society. Over the years, PATMOS has evolved into an important European event, where - searchers from both industry and academia discuss and investigate the emerging ch- lenges in future and contemporary applications, design methodologies, and tools - quired for the developmentof upcominggenerationsof integrated circuits and systems. The technical program of PATMOS 2005 contained state-of-the-art technical contri- tions, three invited talks, a special session on hearing-aid design, and an embedded - torial. The technical program focused on timing, performance and power consumption, as well as architectural aspects

with particular emphasis on modeling, design, char- terization, analysis and optimization in the nanometer era. The Technical Program Committee, with the assistance of additional expert revi- ers, selected the 74 papers to be presented at PATMOS. The papers were divided into 11 technical sessions and 3 poster sessions. As is always the case with the PATMOS workshops, the review process was anonymous, full papers were required, and several reviews were carried out per paper. Beyond the presentations of the papers, the PATMOS technical program was - riched by a series of speeches offered by world class experts, on important emerging research issues of industrial relevance. Prof. Jan Rabaey, Berkeley, USA, gave a talk on "Traveling the Wild Frontier of Ulta Low-Power Design", Dr. Sung Bae Park, S- sung, gave a presentation on "DVL (Deep Low Voltage): Circuits and Devices", Prof.

Design and Analysis of High Efficiency Line Drivers for xDSL - Tim Piessens 2006-04-18
Design and Analysis of High Efficiency Line Drivers for xDSL covers the most important building block of an xDSL (ADSL, VDSL, ...) system: the line driver. Traditional Class AB line drivers consume more than 70% of the total power budget of state-of-the-art ADSL modems. This book describes the main difficulties in designing line drivers for xDSL. The most important specifications are elaborated staring from the main properties of the channel and the signal properties. The traditional (class AB), state-of-the-art (class G) and future technologies (class K) are discussed. The main part of Design and Analysis of High Efficiency Line Drivers for xDSL describes the design of a novel architecture: the Self-Oscillating Power Amplifier or SOPA.

Low-Energy FPGAs — Architecture and Design - Varghese George 2012-12-06
Low-Energy FPGAs: Architecture and Design is a primary resource for both researchers and practicing engineers in the field of digital circuit design. The book addresses the energy consumption of Field-Programmable Gate Arrays (FPGAs). FPGAs are becoming popular as embedded components in computing platforms. The programmability of the FPGA can be used to customize implementations of functions on an application basis. This leads to performance

gains, and enables reuse of expensive silicon. Chapter 1 provides an overview of digital circuit design and FPGAs. Chapter 2 looks at the implication of deep-submicron technology onFPGA power dissipation. Chapter 3 describes the exploration environment to guide and evaluate design decisions. Chapter 4 discusses the architectural optimization process to evaluate the trade-offs between the flexibility of the architecture, and the effect on the performance metrics. Chapter 5 reviews different circuit techniques to reduce the performance overhead of some of the dominant components. Chapter 6 shows methods to configure FPGAs to minimize the programming overhead. Chapter 7 addresses the physical realization of some of the critical components and the final implementation of a specific low-energy FPGA. Chapter 8 compares the prototype array to an equivalent commercial architecture.

Digital Communications - Bernard Sklar 2016-12-23
The clear, easy-to-understand introduction to digital communications Completely updated coverage of today's most critical technologies Step-by-step implementation coverage Trellis-coded modulation, fading channels, Reed-Solomon codes, encryption, and more Exclusive coverage of maximizing performance with advanced "turbo codes" "This is a remarkably comprehensive treatment of the field, covering in considerable detail modulation, coding (both source and channel), encryption, multiple access and spread spectrum. It can serve both as an excellent introduction for the graduate student with some background in probability theory or as a valuable reference for the practicing ommunication system engineer. For both communities, the treatment is clear and well presented." - Andrew Viterbi, The Viterbi Group Master every key digital communications technology, concept, and technique. Digital Communications, Second Edition is a thoroughly revised and updated edition of the field's classic, best-selling introduction. With remarkable clarity, Dr. Bernard Sklar introduces every digital communication technology at the heart of today's wireless and Internet revolutions, providing a unified structure and context for understanding them -- all without sacrificing mathematical precision. Sklar begins by introducing the fundamentals of signals, spectra, formatting, and baseband transmission. Next, he presents practical coverage of virtually every contemporary modulation, coding, and signal processing technique, with numeric examples and step-by-step implementation guidance. Coverage includes: Signals and processing steps: from information source through transmitter, channel, receiver, and information sink Key tradeoffs: signal-to-noise ratios, probability of error, and bandwidth expenditure Trellis-coded modulation and Reed-Solomon codes: what's behind the math Synchronization and spread spectrum solutions Fading channels: causes, effects, and techniques for withstanding fading The first complete how-to guide to turbo codes: squeezing maximum performance out of digital connections Implementing encryption with PGP, the de facto industry standard Whether you're building wireless systems, xDSL, fiber or coax-based services, satellite networks, or Internet infrastructure, Sklar presents the theory and the practical implementation details you need. With nearly 500 illustrations and 300 problems and exercises, there's never been a faster way to master advanced digital communications. CD-ROM INCLUDED The CD-ROM contains a complete educational version of Elanix' SystemView DSP design software, as well as detailed notes for getting started, a comprehensive DSP tutorial, and over 50 additional communications exercises.

Low Power Digital CMOS Design - Anantha P. Chandrakasan 2012-12-06
Power consumption has become a major design consideration for battery-operated, portable systems as well as high-performance, desktop systems. Strict limitations on power dissipation must be met by the designer while still meeting ever higher computational requirements. A comprehensive approach is thus required at all levels of system design, ranging from algorithms and architectures to the logic styles and the underlying technology. Potentially one of the most important techniques involves combining architecture optimization with voltage scaling, allowing a trade-off between silicon area and low-power operation. Architectural optimization enables supply voltages of the order of 1 V using standard CMOS technology. Several techniques can also be used to minimize the switched

capacitance, including representation, optimizing signal correlations, minimizing spurious transitions, optimizing sequencing of operations, activity-driven power down, etc. The high- efficiency of DC-DC converter circuitry required for efficient, low-voltage and low-current level operation is described by Stratakos, Sullivan and Sanders. The application of various low-power techniques to a chip set for multimedia applications shows that orders-of-magnitude reduction in power consumption is possible. The book also features an analysis by Professor Meindl of the fundamental limits of power consumption achievable at all levels of the design hierarchy. Svensson, of ISI, describes emerging adiabatic switching techniques that can break the CV2f barrier and reduce the energy per computation at a fixed voltage. Srivastava, of AT&T, presents the application of aggressive shut-down techniques to microprocessor applications.

Software Synthesis from Dataflow Graphs - Shuvra S. Bhattacharyya 2012-12-06 Software Synthesis from Dataflow Graphs addresses the problem of generating efficient software implementations from applications specified as synchronous dataflow graphs for programmable digital signal processors (DSPs) used in embedded real- time systems. The advent of high-speed graphics workstations has made feasible the use of graphical block diagram programming environments by designers of signal processing systems. A particular subset of dataflow, called Synchronous Dataflow (SDF), has proven efficient for representing a wide class of unirate and multirate signal processing algorithms, and has been used as the basis for numerous DSP block diagram-based programming environments such as the Signal Processing Workstation from Cadence Design Systems, Inc., COSSAP from Synopsys® (both commercial tools), and the Ptolemy environment from the University of California at Berkeley. A key property of the SDF model is that static schedules can be determined at compile time. This removes the overhead of dynamic scheduling and is thus useful for real-time DSP programs where throughput requirements are often severe. Another constraint that programmable DSPs for embedded systems have is the limited amount of on-chip memory. Off-

chip memory is not only expensive but is also slower and increases the power consumption of the system; hence, it is imperative that programs fit in the on-chip memory whenever possible. Software Synthesis from Dataflow Graphs reviews the state-of-the-art in constructing static, memory-optimal schedules for programs expressed as SDF graphs. Code size reduction is obtained by the careful organization of loops in the target code. Data buffering is optimized by constructing the loop hierarchy in provably optimal ways for many classes of SDF graphs. The central result is a uniprocessor scheduling framework that provably synthesizes the most compact looping structures, called single appearance schedules, for a certain class of SDF graphs. In addition, algorithms and heuristics are presented that generate single appearance schedules optimized for data buffering usage. Numerous practical examples and extensive experimental data are provided to illustrate the efficacy of these techniques.

Digital Pulse-width Modulation Control in Power Electronic Circuits - Angel Vladimirov Peterchev 2005

High-Performance Digital VLSI Circuit Design - Richard X. Gu 2012-12-06 High-Performance Digital VLSI Circuit Design is the first book devoted entirely to the design of digital high-performance VLSI circuits. CMOS, BiCMOS and bipolar ciruits are covered in depth, including state-of-the-art circuit structures. Recent advances in both the computer and telecommunications industries demand high-performance VLSI digital circuits. Digital processing of signals demands high-speed circuit techniques for the GHz range. The design of such circuits represents a great challenge; one that is amplified when the power supply is scaled down to 3.3 V. Moreover, the requirements of low-power/high-performance circuits adds an extra dimension to the design of such circuits. High-Performance Digital VLSI Circuit Design is a self-contained text, introducing the subject of high-performance VLSI circuit design and explaining the speed/power tradeoffs. The first few chapters of the book discuss the necessary background material in the area of device design and device modeling, respectively. High-performance CMOS

circuits are then covered, especially the new all-N-logic dynamic circuits. Propagation delay times of high-speed bipolar CML and ECL are developed analytically to give a thorough understanding of various interacting process, device and circuit parameters. High-current phenomena of bipolar devices are also addressed as these devices typically operate at maximum currents for limited device area. Different, new, high-performance BiCMOS circuits are presented and compared to their conventional counterparts. These new circuits find direct applications in the areas of high-speed adders, frequency dividers, sense amplifiers, level-shifters, input/output clock buffers and PLLs. The book concludes with a few system application examples of digital high-performance VLSI circuits. Audience: A vital reference for practicing IC designers. Can be used as a text for graduate and senior undergraduate students in the area.

CMOS Digital Integrated Circuits - Sung-Mo Kang 2002
The fourth edition of CMOS Digital Integrated Circuits: Analysis and Design continues the well-established tradition of the earlier editions by offering the most comprehensive coverage of digital CMOS circuit design, as well as addressing state-of-the-art technology issues highlighted by the widespread use of nanometer-scale CMOS technologies. In this latest edition, virtually all chapters have been re-written, the transistor model equations and device parameters have been revised to reflect the sigificant changes that must be taken into account for new technology generations, and the material has been reinforced with up-to-date examples. The broad-ranging coverage of this textbook starts with the fundamentals of CMOS process technology, and continues with MOS transistor models, basic CMOS gates, interconnect effects, dynamic circuits, memory circuits, arithmetic building blocks, clock and I/O circuits, low power design techniques, design for manufacturability and design for testability.

Integrated Circuit and System Design - 2005

Ambient Intelligence - Werner Weber 2005-03-04
Ambient intelligence is the vision of a technology that will become invisibly embedded in our natural surroundings, present whenever we need it, enabled by simple and effortless interactions, attuned to all our senses, adaptive to users and context-sensitive, and autonomous. High-quality information access and personalized content must be available to everybody, anywhere, and at any time. This book addresses ambient intelligence used to support human contacts and accompany an individual's path through the complicated modern world. From the technical standpoint, distributed electronic intelligence is addressed as hardware vanishing into the background. Devices used for ambient intelligence are small, low-power, low weight, and (very importantly) low-cost; they collaborate or interact with each other; and they are redundant and error-tolerant. This means that the failure of one device will not cause failure of the whole system. Since wired connections often do not exist, radio methods will play an important role for data transfer. This book addresses various aspects of ambient intelligence, from applications that are imminent since they use essentially existing technologies, to ambitious ideas whose realization is still far away, due to major unsolved technical challenges.

Digital Design - William James Dally 2012-09-17
This book provides students with a system-level perspective and the tools they need to understand, analyze and design complete digital systems using Verilog. It goes beyond the design of simple combinational and sequential modules to show how such modules are used to build complete systems, reflecting digital design in the real world.

Analog Integrated Circuit Design - Tony Chan Carusone 2012
The 2nd Edition of Analog Integrated Circuit Design focuses on more coverage about several types of circuits that have increased in importance in the past decade. Furthermore, the text is enhanced with material on CMOS IC device modeling, updated processing layout and expanded coverage to reflect technical innovations. CMOS devices and circuits have more influence in this edition as well as a reduced amount of text on BiCMOS and bipolar information. New chapters include topics on frequency response of analog ICs and basic

theory of feedback amplifiers.

CMOS - R. Jacob Baker 2008
This edition provides an important contemporary view of a wide range of analog/digital circuit blocks, the BSIM model, data converter architectures, and more. The authors develop design techniques for both long- and short-channel CMOS technologies and then compare the two.

15th Symposium on Integrated Circuits and Systems Design - Ricardo Augusto da Luz Reis 2002

Low Power Design Essentials - Jan Rabaey 2009-04-21
This book contains all the topics of importance to the low power designer. It first lays the foundation and then goes on to detail the design process. The book also discusses such special topics as power management and modal design, ultra low power, and low power design methodology and flows. In addition, coverage includes projections of the future and case studies.

Building Embedded Systems - Changyi Gu 2016-05-26
Develop the software and hardware you never think about. We're talking about the nitty-gritty behind the buttons on your microwave, inside your thermostat, inside the keyboard used to type this description, and even running the monitor on which you are reading it now. Such stuff is termed embedded systems, and this book shows how to design and develop embedded systems at a professional level. Because yes, many people quietly make a successful career doing just that. Building embedded systems can be both fun and intimidating. Putting together an embedded system requires skill sets from multiple engineering disciplines, from software and hardware in particular. Building Embedded Systems is a book about helping you do things in the right way from the beginning of your first project: Programmers who know software will learn what they need to know about hardware. Engineers with hardware knowledge likewise will learn about the software side. Whatever your background is, Building Embedded Systems is the perfect book to fill in any knowledge gaps and get you started in a career programming for everyday devices. Author Changyi Gu brings

more than fifteen years of experience in working his way up the ladder in the field of embedded systems. He brings knowledge of numerous approaches to embedded systems design, including the System on Programmable Chips (SOPC) approach that is currently growing to dominate the field. His knowledge and experience make Building Embedded Systems an excellent book for anyone wanting to enter the field, or even just to do some embedded programming as a side project. What You Will Learn Program embedded systems at the hardware level Learn current industry practices in firmware development Develop practical knowledge of embedded hardware options Create tight integration between software and hardware Practice a work flow leading to successful outcomes Build from transistor level to the system level Make sound choices between performance and cost Who This Book Is For Embedded-system engineers and intermediate electronics enthusiasts who are seeking tighter integration between software and hardware. Those who favor the System on a Programmable Chip (SOPC) approach will in particular benefit from this book. Students in both Electrical Engineering and Computer Science can also benefit from this book and the real-life industry practice it provides.

Low Power Design Methodologies - Jan M. Rabaey 2012-12-06
Low Power Design Methodologies presents the first in-depth coverage of all the layers of the design hierarchy, ranging from the technology, circuit, logic and architectural levels, up to the system layer. The book gives insight into the mechanisms of power dissipation in digital circuits and presents state of the art approaches to power reduction. Finally, it introduces a global view of low power design methodologies and how these are being captured in the latest design automation environments. The individual chapters are written by the leading researchers in the area, drawn from both industry and academia. Extensive references are included at the end of each chapter. Audience: A broad introduction for anyone interested in low power design. Can also be used as a text book for an advanced graduate class. A starting point for any aspiring researcher.

Bibliographic Index - 1997

Analysis and Solutions for Switching Noise Coupling in Mixed-Signal ICs - X. Aragones 2013-03-09
Modern microelectronic design is characterized by the integration of full systems on a single die. These systems often include large high performance digital circuitry, high resolution analog parts, high driving I/O, and maybe RF sections. Designers of such systems are constantly faced with the challenge to achieve compatibility in electrical characteristics of every section: some circuitry presents fast transients and large consumption spikes, whereas others require quiet environments to achieve resolutions well beyond millivolts. Coupling between those sections is usually unavoidable, since the entire system shares the same silicon substrate bulk and the same package. Understanding the way coupling is produced, and knowing methods to isolate coupled circuitry, and how to apply every method, is then mandatory knowledge for every IC designer. Analysis and Solutions for Switching Noise Coupling in Mixed-Signal ICs is an in-depth look at coupling through the common silicon substrate, and noise at the power supply lines. It explains the elementary knowledge needed to understand these phenomena and presents a review of previous works and new research results. The aim is to provide an understanding of the reasons for these particular ways of coupling, review and suggest solutions to noise coupling, and provide criteria to apply noise reduction. Analysis and Solutions for Switching Noise Coupling in Mixed-Signal ICs is an ideal book, both as introductory material to noise-coupling problems in mixed-signal ICs, and for more advanced designers facing this problem.

Automatic Speech and Speaker Recognition - Chin-Hui Lee 2012-12-06
Research in the field of automatic speech and speaker recognition has made a number of significant advances in the last two decades, influenced by advances in signal processing, algorithms, architectures, and hardware. These advances include: the adoption of a statistical pattern recognition paradigm; the use of the hidden Markov modeling framework to characterize both the spectral and the temporal variations in the speech signal; the use of a large set of speech utterance examples from a large population of speakers to train the hidden Markov models of some fundamental speech units; the organization of speech and language knowledge sources into a structural finite state network; and the use of dynamic, programming based heuristic search methods to find the best word sequence in the lexical network corresponding to the spoken utterance. Automatic Speech and Speaker Recognition: Advanced Topics groups together in a single volume a number of important topics on speech and speaker recognition, topics which are of fundamental importance, but not yet covered in detail in existing textbooks. Although no explicit partition is given, the book is divided into five parts: Chapters 1-2 are devoted to technology overviews; Chapters 3-12 discuss acoustic modeling of fundamental speech units and lexical modeling of words and pronunciations; Chapters 13-15 address the issues related to flexibility and robustness; Chapter 16-18 concern the theoretical and practical issues of search; Chapters 19-20 give two examples of algorithm and implementational aspects for recognition system realization. Audience: A reference book for speech researchers and graduate students interested in pursuing potential research on the topic. May also be used as a text for advanced courses on the subject.

Digital Integrated Circuit Design - Hubert Kaeslin 2008-04-28
This practical, tool-independent guide to designing digital circuits takes a unique, top-down approach, reflecting the nature of the design process in industry. Starting with architecture design, the book comprehensively explains the why and how of digital circuit design, using the physics designers need to know, and no more.

Advanced Concepts in Adaptive Signal Processing - W. Kenneth Jenkins 2012-12-06
Although adaptive filtering and adaptive array processing began with research and development efforts in the late 1950's and early 1960's, it was not until the publication of the pioneering books by Honig and Messerschmitt in 1984 and Widrow and Stearns in 1985 that the field of adaptive signal processing began to emerge as a distinct discipline in its own right.

Since 1984 many new books have been published on adaptive signal processing, which serve to define what we will refer to throughout this book as conventional adaptive signal processing. These books deal primarily with basic architectures and algorithms for adaptive filtering and adaptive array processing, with many of them emphasizing practical applications. Most of the existing textbooks on adaptive signal processing focus on finite impulse response (FIR) filter structures that are trained with strategies based on steepest descent optimization, or more precisely, the least mean square (LMS) approximation to steepest descent. While literally hundreds of archival research papers have been published that deal with more advanced adaptive filtering concepts, none of the current books attempt to treat these advanced concepts in a unified framework. The goal of this new book is to present a number of important, but not so well known, topics that currently exist scattered in the research literature. The book also documents some new results that have been conceived and developed through research conducted at the University of Illinois during the past five years.

Wireless Technologies - Krzysztof Iniewski 2017-12-19
Advanced concepts for wireless technologies present a vision of technology that is embedded in our surroundings and practically invisible. From established radio techniques like GSM, 802.11 or Bluetooth to more emerging technologies, such as Ultra Wide Band and smart dust motes, a common denominator for future progress is the underlying integrated circuit technology. Wireless Technologies responds to the explosive growth of standard cellular radios and radically different wireless applications by presenting new architectural and circuit solutions engineers can use to solve modern design problems. This reference addresses state-of-the art CMOS design in the context of emerging wireless applications, including 3G/4G cellular telephony, wireless sensor networks, and wireless medical application. Written by top international experts specializing in both the IC industry and academia, this carefully edited work uncovers new design opportunities in body area networks, medical implants, satellite communications, automobile radar detection, and wearable electronics. The book is divided into three sections: wireless system perspectives, chip architecture and implementation issues, and devices and technologies used to fabricate wireless integrated circuits. Contributors address key issues in the development of future silicon-based systems, such as scale of integration, ultra-low power dissipation, and the integration of heterogeneous circuit design style and processes onto one substrate. Wireless sensor network systems are now being applied in critical applications in commerce, healthcare, and security. This reference, which contains 25 practical and scientifically rigorous articles, provides the knowledge communications engineers need to design innovative methodologies at the circuit and system level.

Networks on Chip - Axel Jantsch 2007-05-08
As the number of processor cores and IP blocks integrated on a single chip is steadily growing, a systematic approach to design the communication infrastructure becomes necessary. Different variants of packed switched on-chip networks have been proposed by several groups during the past two years. This book summarizes the state of the art of these efforts and discusses the major issues from the physical integration to architecture to operating systems and application interfaces. It also provides a guideline and vision about the direction this field is moving to. Moreover, the book outlines the consequences of adopting design platforms based on packet switched network. The consequences may in fact be far reaching because many of the topics of distributed systems, distributed real-time systems, fault tolerant systems, parallel computer architecture, parallel programming as well as traditional system-on-chip issues will appear relevant but within the constraints of a single chip VLSI implementation.