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Digital Electronics 1 - Tertulien Ndjountche 2016-06-17

The omnipresence of electronic devices in our everyday lives has been accompanied by the downscaling of chip feature sizes and the ever increasing complexity of digital circuits. This book is devoted to the analysis and design of digital circuits, where the signal can assume only two possible logic levels. It deals with the basic principles and concepts of digital electronics. It addresses all aspects of combinational logic and provides a detailed understanding of logic gates that are the basic components in the implementation of circuits used to perform functions and operations of Boolean algebra. Combinational logic circuits are characterized by outputs that depend only on the actual input values. Efficient techniques to derive logic equations are proposed together with methods of analysis and synthesis of combinational logic circuits. Each chapter is well structured and is supplemented by a selection of solved exercises covering logic design practices.

The Essentials of Computer Organization and Architecture - Linda Null 2014-02-14

Updated and revised, The Essentials of Computer Organization and Architecture, Third Edition is a comprehensive resource that addresses all of the necessary organization and architecture topics, yet is appropriate for the one-term course.

RTL Hardware Design Using VHDL - Pong P. Chu 2006-04-20

The skills and guidance needed to master RTL hardware design This book teaches readers how to systematically design efficient, portable, and scalable Register Transfer Level (RTL) digital circuits using the VHDL hardware description language and synthesis software. Focusing on the module-level design, which is composed of functional units, routing circuit, and storage, the book illustrates the relationship between the VHDL constructs and the underlying hardware components, and shows how to develop codes that faithfully reflect the module-level design and can be synthesized into efficient gate-level implementation. Several unique features distinguish the book: * Coding style that shows a clear relationship between VHDL constructs and hardware components * Conceptual diagrams that illustrate the realization of VHDL codes * Emphasis on the code reuse * Practical examples that demonstrate and reinforce design concepts, procedures, and techniques * Two chapters on realizing sequential algorithms in hardware * Two chapters on scalable and parameterized designs and coding * One chapter covering the synchronization and interface between multiple clock domains Although the focus of the book is RTL synthesis, it also examines the synthesis task from the perspective of the overall development process. Readers learn good design practices and guidelines to ensure that an RTL design can accommodate future simulation, verification, and testing needs, and can be easily incorporated into a larger system or reused. Discussion is independent of technology and can be applied to both ASIC and FPGA devices. With a balanced presentation of fundamentals and practical examples, this is an excellent textbook for upper-level undergraduate or graduate courses in advanced digital logic. Engineers who need to make effective use of today's synthesis software and FPGA devices should also refer to this book.

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 significant 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.

Digital Design John F. Wakerly 2018

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 communication 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.

MSP430 Microcontroller Basics - John H. Davies 2008-08-21

The MSP430 microcontroller family offers ultra-low power mixed signal, 16-bit architecture that is perfect for wireless low-power industrial and portable medical applications. This book begins with an overview of embedded systems and microcontrollers followed by a comprehensive in-depth look at the MSP430. The

coverage included a tour of the microcontroller's architecture and functionality along with a review of the development environment. Start using the MSP430 armed with a complete understanding of the microcontroller and what you need to get the microcontroller up and running! Details C and assembly language for the MSP430 Companion Web site contains a development kit Full coverage is given to the MSP430 instruction set, and sigma-delta analog-digital converters and timers

Electrical Engineering Fundamentals II - Thomas Talavage 2019-08-06

As the name implies, this course is designed to provide a "Fundamental" approach to Electrical Engineering following the Fundamentals I course. We begin our journey with some basic circuit elements and develop a mathematically motivated approach to linear circuit analysis using Ordinary Differential Equations (ODEs) to discover Convolution, Laplace Transforms, Transfer Functions, and Frequency Filtering. The later lectures will cover variable frequency behavior. The series ends with how circuits behave and are modeled at high frequencies. Our goal with this text is two fold: 1. To provide a more specific, lecture-style approach for formal course documentation. Although large encyclopedic texts are useful as references, one will not be required for this course. 2. To dramatically reduce the cost for students and increase the flexibility of future editions by unconventionally self-publishing. The textbook industry has become too expensive for students to afford new books year after year and we feel that students should not have to bear the financial burden in addition to continually rising tuition costs. The low cost will hopefully encourage students to keep this packet as a reference as they professionally progress (rather than sell it back for cash to buy next semester's books!) Funds collected from sales directly help support further development of this packet and the course for future generations. We appreciate your help!

Digital Design with RTL Design, VHDL, and Verilog - Frank Vahid 2010-03-09

An eagerly anticipated, up-to-date guide to essential digital design fundamentals Offering a modern, updated approach to digital design, this much-needed book reviews basic design fundamentals before diving into specific details of design optimization. You begin with an examination of the low-levels of design, noting a clear distinction between design and gate-level minimization. The author then progresses to the key uses of digital design today, and how it is used to build high-performance alternatives to software. Offers a fresh, up-to-date approach to digital design, whereas most literature available is sorely outdated Progresses through low levels of design, making a clear distinction between design and gate-level minimization Addresses the various uses of digital design today Enables you to gain a clearer understanding of applying digital design to your life With this book by your side, you'll gain a better understanding of how to apply the material in the book to real-world scenarios.

The Art of Digital Design - Franklin P. Prosser 1987

Hardware -- Logic Design.

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.

Fundamentals of Digital Logic with Verilog Design - Stephen Brown 2013-03-15

Fundamentals of Digital Logic With Verilog Design teaches the basic design techniques for logic circuits. It emphasizes the synthesis of circuits and explains how circuits are implemented in real chips. Fundamental concepts are illustrated by using small examples. Use of CAD software is well integrated into the book. A CD-ROM that contains Altera's Quartus CAD software comes free with every copy of the text. The CAD software provides automatic mapping of a design written in Verilog into Field Programmable Gate Arrays (FPGAs) and Complex Programmable Logic Devices (CPLDs). Students will be able to try, firsthand, the book's Verilog examples (over 140) and homework problems. Engineers use Quartus CAD for designing, simulating, testing and implementing logic circuits. The version included with this text supports all major features of the commercial product and comes with a compiler for the IEEE standard Verilog language. Students will be able to: enter a design into the CAD system compile the design into a selected device simulate the functionality and timing of the resulting circuit implement the designs in actual devices (using the school's laboratory facilities) Verilog is a complex language, so it is introduced gradually in the book. Each Verilog feature is presented as it becomes pertinent for the circuits being discussed. To teach the student to use the Quartus CAD, the book includes three tutorials.

ARM Assembly Language - An Introduction (Second Edition) - J. R. Gibson 2011

An introductory text describing the ARM assembly language and its use for simple programming tasks.

Computer Organization and Design - John L. Hennessy 1998

The performance of software systems is dramatically affected by how well software designers understand the basic hardware technologies at work in a system. Similarly, hardware designers must understand the far-reaching effects their design decisions have on software applications. For readers in either category, this classic introduction to the field provides a look deep into the computer. It demonstrates the relationships between the software and hardware and focuses on the foundational concepts that are the basis for current computer design.

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.

Diseno Digital - John F. Wakerly 2001

Sistemas y códigos numéricos - Circuitos digitales - Principios de diseño lógico combinacional - Prácticas de diseño lógico combinacional - Ejemplos de diseño de circuitos combinacionales - Principios de diseño lógico secuencial - Prácticas de diseño lógico secuencial - Ejemplos de diseño de circuitos secuenciales - Memorias, dispositivos CPLD y FPGA - Temas adicionales del mundo real.

Designing Digital Systems with SystemVerilog - Brent Nelson 2019-06-24

This is an introductory textbook on digital logic and digital systems design where the SystemVerilog language is interwoven throughout the text. This provides both new learners as well as existing digital logic designers a full introduction to SystemVerilog and its use for designing digital systems.

Digital Design (Verilog) - Peter J. Ashenden 2007-10-24

Digital Design: An Embedded Systems Approach Using Verilog provides a foundation in digital design for

students in computer engineering, electrical engineering and computer science courses. It takes an up-to-date and modern approach of presenting digital logic design as an activity in a larger systems design context. Rather than focus on aspects of digital design that have little relevance in a realistic design context, this book concentrates on modern and evolving knowledge and design skills. Hardware description language (HDL)-based design and verification is emphasized--Verilog examples are used extensively throughout. By treating digital logic as part of embedded systems design, this book provides an understanding of the hardware needed in the analysis and design of systems comprising both hardware and software components. Includes a Web site with links to vendor tools, labs and tutorials. Presents digital logic design as an activity in a larger systems design context Features extensive use of Verilog examples to demonstrate HDL (hardware description language) usage at the abstract behavioural level and register transfer level, as well as for low-level verification and verification environments Includes worked examples throughout to enhance the reader's understanding and retention of the material Companion Web site includes links to tools for FPGA design from Synplicity, Mentor Graphics, and Xilinx, Verilog source code for all the examples in the book, lecture slides, laboratory projects, and solutions to exercises

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.

Reliability of Computer Systems and Networks - Martin L. Shooman 2003-04-08

With computers becoming embedded as controllers in everything from network servers to the routing of subway schedules to NASA missions, there is a critical need to ensure that systems continue to function even when a component fails. In this book, bestselling author Martin Shooman draws on his expertise in reliability engineering and software engineering to provide a complete and authoritative look at fault tolerant computing. He clearly explains all fundamentals, including how to use redundant elements in system design to ensure the reliability of computer systems and networks. Market: Systems and Networking Engineers, Computer Programmers, IT Professionals.

Digital Design - John F. Wakerly 2017-05-26

Establishing a solid foundation of digital design principles An authoritative introduction to basic digital design, *Digital Design: Principles and Practices* helps readers build a foundational understanding of theoretical and engineering principles. This book gives readers the opportunity to learn the basics at the high level (HDLs), at the low level (electrical circuits), and throughout the "vast middle" (gates, flip-flops, and higher-level digital-design building blocks). The author's 30 years of experience in both industrial and university settings brings weight and credibility to the material, and with broad coverage of logic design practices, the 5th Edition gives readers a look at how digital design works in the real world.

Computer Organization and Design RISC-V Edition - David A. Patterson 2017-05-12

The new RISC-V Edition of *Computer Organization and Design* features the RISC-V open source instruction set architecture, the first open source architecture designed to be used in modern computing environments such as cloud computing, mobile devices, and other embedded systems. With the post-PC era now upon us, *Computer Organization and Design* moves forward to explore this generational change with examples, exercises, and material highlighting the emergence of mobile computing and the Cloud. Updated content featuring tablet computers, Cloud infrastructure, and the x86 (cloud computing) and ARM (mobile computing devices) architectures is included. An online companion Web site provides advanced content for further study, appendices, glossary, references, and recommended reading. Features RISC-V, the first such architecture designed to be used in modern computing environments, such as cloud computing, mobile devices, and other embedded systems Includes relevant examples, exercises, and material highlighting the emergence of mobile computing and the cloud

Books in Print - 1994

Digital Design John F. Wakerly 1994

This popular volume provides a solid foundation in the elements of basic digital electronics and switching theory that are used in most practical digital design today -- and builds on that theory with discussions of

real-world digital components, design methodologies, and tools. Covers a full range of topics -- number systems and codes, digital circuits, combinational logic design principles and practices, combinational logic design with PLDs, sequential logic design principles and practices, sequential logic design with PLDs, memory, and additional real-world topics (e.g., computer-aided engineering tools, design for testability, estimating digital system reliability, and transmission lines, reflections, and termination). This edition introduces PLDs as soon as possible, emphasizes CMOS logic families and introduces digital circuits in a strongly technology-independent fashion, covers the latest Generic Array Logic (GAL) devices, offers expanded coverage of ROM and RAM system-level design, and provides additional design examples. For those needing a solid introduction or review of the principles and practices of modern digital design. Previously announced in Oct. 1992 PTR Catalogue.

Digital System Design with VHDL Wolinski 2004-09

Digital Design, Global Edition - M. Morris Mano 2018-05-24

For introductory courses on digital design in an Electrical Engineering, Computer Engineering, or Computer Science department. A clear and accessible approach to teaching the basic tools, concepts, and applications of digital design. A modern update to a classic, authoritative text, *Digital Design, 6th Edition* teaches the fundamental concepts of digital design in a clear, accessible manner. The text presents the basic tools for the design of digital circuits and provides procedures suitable for a variety of digital applications. Like the previous editions, this edition of *Digital Design* supports a multimodal approach to learning, with a focus on digital design, regardless of language. Recognising that three public-domain languages--Verilog, VHDL, and SystemVerilog--all play a role in design flows for today's digital devices, the 6th Edition offers parallel tracks of presentation of multiple languages, but allows concentration on a single, chosen language.

Introduction to Combinatorial Algorithms and Boolean Functions Donald Ervin Knuth 2008

To begin the fourth and later volume of the set, Knuth has created a series of small books called fascicles, which publish at regular intervals as they are ready. Each fascicle encompasses a section or more of wholly new material. Ultimately, the content of the fascicles will be rolled up into the comprehensive, final version of each volume.

Digital Electronics and Design with VHDL - Volnei A. Pedroni 2008-01-25

Digital Electronics and Design with VHDL offers a friendly presentation of the fundamental principles and practices of modern digital design. Unlike any other book in this field, transistor-level implementations are also included, which allow the readers to gain a solid understanding of a circuit's real potential and limitations, and to develop a realistic perspective on the practical design of actual integrated circuits. Coverage includes the largest selection available of digital circuits in all categories (combinational, sequential, logical, or arithmetic); and detailed digital design techniques, with a thorough discussion on state-machine modeling for the analysis and design of complex sequential systems. Key technologies used in modern circuits are also described, including Bipolar, MOS, ROM/RAM, and CPLD/FPGA chips, as well as codes and techniques used in data storage and transmission. Designs are illustrated by means of complete, realistic applications using VHDL, where the complete code, comments, and simulation results are included. This text is ideal for courses in Digital Design, Digital Logic, Digital Electronics, VLSI, and VHDL; and industry practitioners in digital electronics. Comprehensive coverage of fundamental digital concepts and principles, as well as complete, realistic, industry-standard designs Many circuits shown with internal details at the transistor-level, as in real integrated circuits Actual technologies used in state-of-the-art digital circuits presented in conjunction with fundamental concepts and principles Six chapters dedicated to VHDL-based techniques, with all VHDL-based designs synthesized onto CPLD/FPGA chips

Electric Circuits Fundamentals Sergio Franco 1994-08

This exciting new text teaches the foundations of electric circuits and develops a thinking style and a problem-solving methodology that is based on physical insight. Designed for the first course or sequence in circuits in electrical engineering, the approach imparts not only an appreciation for the elegance of the mathematics of circuit theory, but a genuine "feel" for a circuit's physical operation. This will benefit students not only in the rest of the curriculum, but in being able to cope with the rapidly changing

technology they will face on-the-job. The text covers all the traditional topics in a way that holds students' interest. The presentation is only as mathematically rigorous as is needed, and theory is always related to real-life situations. Franco introduces ideal transformers and amplifiers early on to stimulate student interest by giving a taste of actual engineering practice. This is followed by extensive coverage of the operational amplifier to provide a practical illustration of abstract but fundamental concepts such as impedance transformation and root location control—always with a vigilant eye on the underlying physical basis. SPICE is referred to throughout the text as a means for checking the results of hand calculations, and in separate end-of-chapter sections, which introduce the most important SPICE features at the specific points in the presentation at which students will find them most useful. Over 350 worked examples, 400-plus exercises, and 1000 end-of-chapter problems help students develop an engineering approach to problem solving based on conceptual understanding and physical intuition rather than on rote procedures.

Digital Electronics 2 - Tertulien Ndjountche 2016-08-29

As electronic devices become increasingly prevalent in everyday life, digital circuits are becoming even more complex and smaller in size. This book presents the basic principles of digital electronics in an accessible manner, allowing the reader to grasp the principles of combinational and sequential logic and the underlying techniques for the analysis and design of digital circuits. Providing a hands-on approach, this work introduces techniques and methods for establishing logic equations and designing and analyzing digital circuits. Each chapter is supplemented with practical examples and well-designed exercises with worked solutions. This second of three volumes focuses on sequential and arithmetic logic circuits. It covers various aspects related to the following topics: latch and flip-flop; binary counters; shift registers; arithmetic and logic circuits; digital integrated circuit technology; semiconductor memory; programmable logic circuits. Along with the two accompanying volumes, this book is an indispensable tool for students at a bachelors or masters level seeking to improve their understanding of digital electronics, and is detailed enough to serve as a reference for electronic, automation and computer engineers.

Digital System Design with SystemVerilog - Mark Zwolinski 2009-10-23

The Definitive, Up-to-Date Guide to Digital Design with SystemVerilog: Concepts, Techniques, and Code To design state-of-the-art digital hardware, engineers first specify functionality in a high-level Hardware Description Language (HDL)—and today's most powerful, useful HDL is SystemVerilog, now an IEEE standard. Digital System Design with SystemVerilog is the first comprehensive introduction to both SystemVerilog and the contemporary digital hardware design techniques used with it. Building on the proven approach of his bestselling Digital System Design with VHDL, Mark Zwolinski covers everything engineers need to know to automate the entire design process with SystemVerilog—from modeling through functional simulation, synthesis, timing simulation, and verification. Zwolinski teaches through about a hundred and fifty practical examples, each with carefully detailed syntax and enough in-depth information to enable rapid hardware design and verification. All examples are available for download from the book's companion Web site, zwolinski.org. Coverage includes Using electronic design automation tools with programmable logic and ASIC technologies Essential principles of Boolean algebra and combinational logic design, with discussions of timing and hazards Core modeling techniques: combinational building blocks, buffers, decoders, encoders, multiplexers, adders, and parity checkers Sequential building blocks: latches, flip-flops, registers, counters, memory, and sequential multipliers Designing finite state machines: from ASM chart to D flip-flops, next state, and output logic Modeling interfaces and packages with SystemVerilog Designing testbenches: architecture, constrained random test generation, and assertion-based verification Describing RTL and FPGA synthesis models Understanding and implementing Design-for-Test Exploring anomalous behavior in asynchronous sequential circuits Performing Verilog-AMS and mixed-signal modeling Whatever your experience with digital design, older versions of Verilog, or VHDL, this book will help you discover SystemVerilog's full power and use it to the fullest.

Computer Science - Behrouz A. Forouzan 1997-01-01

Digital Design - John F. Wakerly 2001

CD-ROM contains: Xilinx student edition foundation series software.

Digital Design - M. Morris Mano 2013

For courses on digital design in an Electrical Engineering, Computer Engineering, or Computer Science department. Digital Design, fifth edition is a modern update of the classic authoritative text on digital design. This book teaches the basic concepts of digital design in a clear, accessible manner. The book presents the basic tools for the design of digital circuits and provides procedures suitable for a variety of digital applications.

Design Through Verilog HDL - T. R. Padmanabhan 2003-11-05

A comprehensive resource on Verilog HDL for beginners and experts Large and complicated digital circuits can be incorporated into hardware by using Verilog, a hardware description language (HDL). A designer aspiring to master this versatile language must first become familiar with its constructs, practice their use in real applications, and apply them in combinations in order to be successful. Design Through Verilog HDL affords novices the opportunity to perform all of these tasks, while also offering seasoned professionals a comprehensive resource on this dynamic tool. Describing a design using Verilog is only half the story: writing test-benches, testing a design for all its desired functions, and how identifying and removing the faults remain significant challenges. Design Through Verilog HDL addresses each of these issues concisely and effectively. The authors discuss constructs through illustrative examples that are tested with popular simulation packages, ensuring the subject matter remains practically relevant. Other important topics covered include: Primitives Gate and Net delays Buffers CMOS switches State machine design Further, the authors focus on illuminating the differences between gate level, data flow, and behavioral styles of Verilog, a critical distinction for designers. The book's final chapters deal with advanced topics such as timescales, parameters and related constructs, queues, and switch level design. Each chapter concludes with exercises that both ensure readers have mastered the present material and stimulate readers to explore avenues of their own choosing. Written and assembled in a paced, logical manner, Design Through Verilog HDL provides professionals, graduate students, and advanced undergraduates with a one-of-a-kind resource.

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.

FSM based Digital Design using Verilog HDL Peter Minns 2008-04-30

As digital circuit elements decrease in physical size, resulting in increasingly complex systems, a basic logic model that can be used in the control and design of a range of semiconductor devices is vital. Finite State Machines (FSM) have numerous advantages; they can be applied to many areas (including motor control, and signal and serial data identification to name a few) and they use less logic than their alternatives, leading to the development of faster digital hardware systems. This clear and logical book presents a range of novel techniques for the rapid and reliable design of digital systems using FSMs, detailing exactly how and where they can be implemented. With a practical approach, it covers synchronous and asynchronous FSMs in the design of both simple and complex systems, and Petri-Net design techniques for sequential/parallel control systems. Chapters on Hardware Description Language cover the widely-used and powerful Verilog HDL in sufficient detail to facilitate the description and verification of FSMs, and FSM based systems, at both the gate and behavioural levels. Throughout, the text incorporates many real-world examples that demonstrate designs such as data acquisition, a memory tester, and passive serial data monitoring and detection, among others. A useful accompanying CD offers working Verilog software tools for the capture and simulation of design solutions. With a linear programmed learning format, this book works as a concise guide for the practising digital designer. This book will also be of importance to senior students and postgraduates of electronic engineering, who require design skills for the embedded systems market.

Designing Digital Systems With SystemVerilog (v2.1) - Brent E Nelson 2021-03-29

This is a textbook on digital logic design. It also teaches the SystemVerilog language. The structure of the book makes it useful as both a way to learn digital design, a way to learn SystemVerilog, or both. It is targeted at University level courses or at practicing engineers who desire to learn these topics.

Engineering Digital Design - Richard F. Tinder 2000-01-18

Engineering Digital Design, Second Edition provides the most extensive coverage of any available textbook in digital logic and design. The new REVISED Second Edition published in September of 2002 provides 5 productivity tools free on the accompanying CD ROM. This software is also included on the Instructor's Manual CD ROM and complete instructions accompany each software program. In the REVISED Second Edition modern notation combines with state-of-the-art treatment of the most important subjects in digital design to provide the student with the background needed to enter industry or graduate study at a competitive level. Combinatorial logic design and synchronous and asynchronous sequential machine design methods are given equal weight, and new ideas and design approaches are explored. The productivity tools provided on the accompanying CD are outlined below: [1] EXL-Sim2002 logic simulator: EXL-Sim2002 is a full-featured, interactive, schematic-capture and simulation program that is ideally suited for use with the text at either the entry or advanced-level of logic design. Its many features include drag-and-drop capability, rubber banding, mixed logic and positive logic simulations, macro generation, individual and global (or randomized) delay assignments, connection features that eliminate the need for wire connections, schematic page sizing and zooming, waveform zooming and scrolling, a variety of printout capabilities, and a host of other useful features. [2] BOOZER logic minimizer: BOOZER is a software minimization tool that is recommended for use with the text. It accepts entered variable (EV) or canonical (1's and 0's) data from K-maps or truth tables, with or without don't cares, and returns an optimal or near optimal single or multi-output solution. It can handle up to 12 functions Boolean functions and as many inputs when used on modern computers. [3] ESPRESSO II logic minimizer: ESPRESSO II is another software minimization tool widely used in schools and industry. It supports advanced heuristic algorithms for minimization of two-level, multi-output Boolean functions but does not accept entered variables. It is also readily available from the University of California, Berkeley, 1986 VLSI Tools Distribution. [4] ADAM design software: ADAM (for Automated Design of Asynchronous Machines) is a very powerful productivity tool that permits the automated design of very complex asynchronous state machines, all free of timing defects. The input files are state tables for the desired state machines. The output files are given in the Berkeley format appropriate for directly programming PLAs. ADAM also allows the designer to design

synchronous state machines, timing-defect-free. The options include the lumped path delay (LPD) model or NESTED CELL model for asynchronous FSM designs, and the use of D FLIP-FLOPs for synchronous FSM designs. The background for the use of ADAM is covered in Chapters 11, 14 and 16 of the REVISED 2nd Edition. [5] A-OPS design software: A-OPS (for Asynchronous One-hot Programmable Sequencers) is another very powerful productivity tool that permits the design of asynchronous and synchronous state machines by using a programmable sequencer kernel. This software generates a PLA or PAL output file (in Berkeley format) or the VHDL code for the automated timing-defect-free designs of the following: (a) Any 1-Hot programmable sequencer up to 10 states. (b) The 1-Hot design of multiple asynchronous or synchronous state machines driven by either PLDs or RAM. The input file is that of a state table for the desired state machine. This software can be used to design systems with the capability of instantly switching between several radically different controllers on a time-shared basis. The background for the use of A-OPS is covered in Chapters 13, 14 and 16 of the REVISED 2nd Edition.

Digital Design - John F. Wakerly 1994

This popular volume provides a solid foundation in the elements of basic digital electronics and switching theory that are used in most practical digital design today -- and builds on that theory with discussions of real-world digital components, design methodologies, and tools. Covers a full range of topics -- number systems and codes, digital circuits, combinational logic design principles and practices, combinational logic design with PLDs, sequential logic design principles and practices, sequential logic design with PLDs, memory, and additional real-world topics (e.g., computer-aided engineering tools, design for testability, estimating digital system reliability, and transmission lines, reflections, and termination). This edition introduces PLDs as soon as possible, emphasizes CMOS logic families and introduces digital circuits in a strongly technology-independent fashion, covers the latest Generic Array Logic (GAL) devices, offers expanded coverage of ROM and RAM system-level design, and provides additional design examples. For those needing a solid introduction or review of the principles and practices of modern digital design. Previously announced in Oct. 1992 PTR Catalogue.