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Verilog — 2001 Stuart Sutherland 2012-12-06 by Phil Moorby The Verilog Hardware Description Language has had an amazing impact on the mod em electronics industry, considering that the essential composition of the language was developed in a surprisingly short period of time, early in 1984. Since its introduction, Verilog has changed very little. Over time, users have requested many improve ments to meet new methodology needs. But, it is a complex and time consuming process to add features to a language without ambiguity, and maintaining consistency. A group of Verilog enthusiasts, the IEEE 1364 Verilog committee, have broken the Verilog feature doldrums. These individuals should be applauded. They invested the time and energy, often their personal time, to understand and resolve an extensive wish-list of language enhancements. They took on the task of choosing a feature set that would stand up to the scrutiny of the standardization process. I would like to personally thank this group. They have shown that it is possible to evolve Verilog, rather than having to completely start over with some revolutionary new language. The Verilog 1364-2001 standard provides many of the

advanced building blocks that users have requested. The enhancements include key components for verification, abstract design, and other new methodology capabilities. As designers tackle advanced issues such as automated verification, system partitioning, etc., the Verilog standard will rise to meet the continuing challenge of electronics design.

Compiling Esterel Dumitru Potop-Butucaru 2007-05-18 Designed as the definitive reference on the compilation of the Esterel synchronous reactive real-time language, Compiling Esterel covers all aspects of the language. The book includes a tutorial, a reference manual, formal semantics, and detailed technical information about the many techniques used to compile it.

Researchers as well as advanced developers will find this book essential for understanding Esterel at all levels.

Verilog: Frequently Asked Questions Shivakumar S. Chonnad 2007-05-08 The Verilog Hardware Description Language was first introduced in 1984. Over the 20 year history of Verilog, every Verilog engineer has developed his own personal “bag of tricks” for coding with Verilog. These tricks enable modeling or verifying designs more easily and more accurately. Developing this bag of

tricks is often based on years of trial and error. Through experience, engineers learn that one specific coding style works best in some circumstances, while in another situation, a different coding style is best. As with any high-level language, Verilog often provides engineers several ways to accomplish a specific task. Wouldn't it be wonderful if an engineer first learning Verilog could start with another engineer's bag of tricks, without having to go through years of trial and error to decide which style is best for which circumstance? That is where this book becomes an invaluable resource. The book presents dozens of Verilog tricks of the trade on how to best use the Verilog HDL for modeling designs at various level of abstraction, and for writing test benches to verify designs. The book not only shows the correct ways of using Verilog for different situations, it also presents alternate styles, and discusses the pros and cons of these styles.

Gnuplot in Action Philipp K. Janert 2016-03-08 Summary Gnuplot in Action, Second Edition is a major revision of this popular and authoritative guide for developers, engineers, and scientists who want to learn and use gnuplot effectively. Fully updated for gnuplot version 5, the book includes four pages of color illustrations and four bonus appendixes available in the eBook.

Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Gnuplot is an open-source graphics program that helps you analyze, interpret, and present numerical data. Available for Unix, Mac, and Windows, it is well-maintained, mature, and totally free. About the Book Gnuplot in Action, Second Edition is a major revision of this authoritative guide for developers, engineers, and scientists. The book starts with a tutorial introduction, followed by a systematic overview of gnuplot's core features and full coverage of gnuplot's advanced capabilities. Experienced readers will appreciate the discussion of gnuplot 5's features, including new plot types, improved text and color handling, and support for interactive, web-based display formats. The book

concludes with chapters on graphical effects and general techniques for understanding data with graphs. It includes four pages of color illustrations. 3D graphics, false-color plots, heatmaps, and multivariate visualizations are covered in chapter-length appendixes available in the eBook. What's Inside Creating different types of graphs in detail Animations, scripting, batch operations Extensive discussion of terminals Updated to cover gnuplot version 5 About the Reader No prior experience with gnuplot is required. This book concentrates on practical applications of gnuplot relevant to users of all levels.

About the Author Philipp K. Janert, PhD, is a programmer and scientist. He is the author of several books on data analysis and applied math and has been a gnuplot power user and developer for over 20 years. Table of Contents PART 1 GETTING STARTED Prelude: understanding data with gnuplot Tutorial: essential gnuplot The heart of the matter: the plot command PART 2 CREATING GRAPHS Managing data sets and files Practical matters: strings, loops, and history A catalog of styles Decorations: labels, arrows, and explanations All about axes PART 3 MASTERING TECHNICALITIES Color, style, and appearance Terminals and output formats Automation, scripting, and animation Beyond the defaults: workflow and styles PART 4 UNDERSTANDING DATA Basic techniques of graphical analysis Topics in graphical analysis Coda: understanding data with graphs

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Cryostat Design J.G. Weisend II 2016-08-12 This book enables the reader to learn the fundamental and applied aspects of practical cryostat design by examining previous design choices and resulting cryostat performance. Through a series of extended case studies the book presents an overview of existing cryostat design covering a wide range of cryostat types and applications, including the magnet cryostats that comprise the majority of the Large Hadron Collider at CERN, space-borne cryostats containing sensors operating below 1 K, and large cryogenic liquid storage vessels. It starts with an introductory section on the principles of cryostat design including practical

data and equations. This section is followed by a series of case studies on existing cryostats, describing the specific requirements of the cryostat, the challenges involved and the design choices made along with the resulting performance of the cryostat. The cryostat examples used in the studies are chosen to cover a broad range of cryostat applications and the authors of each case are leading experts in the field, most of whom participated in the design of the cryostats being described. The concluding chapter offers an overview of lessons learned and summarises some key hints and tips for practical cryostat design. The book will help the reader to expand their knowledge of many disciplines required for good cryostat design, including the cryogenic properties of materials, heat transfer and thermal insulation, instrumentation, safety, structures and seals.

Handbook of Open Source Tools Sandeep Koranne 2010-10-17 Handbook of Open Source Tools introduces a comprehensive collection of advanced open source tools useful in developing software applications. The book contains information on more than 200 open-source tools which include software construction utilities for compilers, virtual-machines, database, graphics, high-performance computing, OpenGL, geometry, algebra, graph theory, GUIs and more. Special highlights for software construction utilities and application libraries are included. Each tool is covered in the context of a real like application development setting. This unique handbook presents a comprehensive discussion of advanced tools, a valuable asset used by most application developers and programmers; includes a special focus on Mathematical Open Source Software not available in most Open Source Software books, and introduces several tools (eg ACL2, CLIPS, CUDA, and COIN) which are not known outside of select groups, but are very powerful. Handbook of Open Source Tools is designed for application developers and programmers working with Open Source Tools. Advanced-level students concentrating on Engineering, Mathematics and Computer Science will find

this reference a valuable asset as well.

Low-Power High-Level Synthesis for Nanoscale CMOS Circuits Saraju P. Mohanty 2008-05-31 This self-contained book addresses the need for analysis, characterization, estimation, and optimization of the various forms of power dissipation in the presence of process variations of nano-CMOS technologies. The authors show very large-scale integration (VLSI) researchers and engineers how to minimize the different types of power consumption of digital circuits. The material deals primarily with high-level (architectural or behavioral) energy dissipation.

Embedded System Design Frank Vahid 2001-10-17 This book introduces a modern approach to embedded system design, presenting software design and hardware design in a unified manner. It covers trends and challenges, introduces the design and use of single-purpose processors ("hardware") and general-purpose processors ("software"), describes memories and buses, illustrates hardware/software tradeoffs using a digital camera example, and discusses advanced computation models, controls systems, chip technologies, and modern design tools. For courses found in EE, CS and other engineering departments.

The Debian Administrator's Handbook Raphaël Hertzog 2015-10-21 Debian GNU/Linux, a very popular non-commercial Linux distribution, is known for its reliability and richness. Built and maintained by an impressive network of thousands of developers throughout the world, the Debian project is cemented by its social contract. This foundation text defines the project's objective: fulfilling the needs of users with a 100% free operating system. The success of Debian and of its ecosystem of derivative distributions (with Ubuntu at the forefront) means that an increasing number of administrators are exposed to Debian's technologies. This Debian Administrator's Handbook, which has been entirely updated for Debian 8 "Jessie", builds on the success of its 6 previous editions. Accessible to all, this book teaches the essentials to anyone who wants

to become an effective and independent Debian GNU/Linux administrator. It covers all the topics that a competent Linux administrator should master, from installation to updating the system, creating packages and compiling the kernel, but also monitoring, backup and migration, without forgetting advanced topics such as setting up SELinux or AppArmor to secure services, automated installations, or virtualization with Xen, KVM or LXC. This book is not only designed for professional system administrators. Anyone who uses Debian or Ubuntu on their own computer is de facto an administrator and will find tremendous value in knowing more about how their system works.

Being able to understand and resolve problems will save you invaluable time.

Learn more about the book on its official website: debian-handbook.info

SystemVerilog For Design Stuart Sutherland 2013-12-01 SystemVerilog is a rich set of extensions to the IEEE 1364-2001 Verilog Hardware Description Language (Verilog HDL). These extensions address two major aspects of HDL based design. First, modeling very large designs with concise, accurate, and intuitive code. Second, writing high-level test programs to efficiently and effectively verify these large designs. This book, SystemVerilog for Design, addresses the first aspect of the SystemVerilog extensions to Verilog.

Important modeling features are presented, such as two-state data types, enumerated types, user-defined types, structures, unions, and interfaces.

Emphasis is placed on the proper usage of these enhancements for simulation and synthesis. A companion to this book, SystemVerilog for Verification, covers the second aspect of SystemVerilog.

A Guide to Kernel Exploitation Enrico Perla 2010-10-28 A Guide to Kernel Exploitation: Attacking the Core discusses the theoretical techniques and approaches needed to develop reliable and effective kernel-level exploits, and applies them to different operating systems, namely, UNIX derivatives, Mac OS X, and Windows. Concepts and tactics are presented categorically so that even when a specifically detailed vulnerability has been patched, the

foundational information provided will help hackers in writing a newer, better attack; or help pen testers, auditors, and the like develop a more concrete design and defensive structure. The book is organized into four parts. Part I introduces the kernel and sets out the theoretical basis on which to build the rest of the book. Part II focuses on different operating systems and describes exploits for them that target various bug classes. Part III on remote kernel exploitation analyzes the effects of the remote scenario and presents new techniques to target remote issues. It includes a step-by-step analysis of the development of a reliable, one-shot, remote exploit for a real vulnerability a bug affecting the SCTP subsystem found in the Linux kernel. Finally, Part IV wraps up the analysis on kernel exploitation and looks at what the future may hold. Covers a range of operating system families — UNIX derivatives, Mac OS X, Windows Details common scenarios such as generic memory corruption (stack overflow, heap overflow, etc.) issues, logical bugs and race conditions Delivers the reader from user-land exploitation to the world of kernel-land (OS) exploits/attacks, with a particular focus on the steps that lead to the creation of successful techniques, in order to give to the reader something more than just a set of tricks

Real-Time Multi-Chip Neural Network for Cognitive Systems Amir Zjajo 2022-09-01 Simulation of brain neurons in real-time using biophysically-meaningful models is a pre-requisite for comprehensive understanding of how neurons process information and communicate with each other, in effect efficiently complementing in-vivo experiments. In spiking neural networks (SNNs), propagated information is not just encoded by the firing rate of each neuron in the network, as in artificial neural networks (ANNs), but, in addition, by amplitude, spike-train patterns, and the transfer rate. The high level of realism of SNNs and more significant computational and analytic capabilities in comparison with ANNs, however, limit the size of the realized networks. Consequently, the main challenge in building complex and

biophysically-accurate SNNs is largely posed by the high computational and data transfer demands. **Real-Time Multi-Chip Neural Network for Cognitive Systems** presents novel real-time, reconfigurable, multi-chip SNN system architecture based on localized communication, which effectively reduces the communication cost to a linear growth. The system use double floating-point arithmetic for the most biologically accurate cell behavior simulation, and is flexible enough to offer an easy implementation of various neuron network topologies, cell communication schemes, as well as models and kinds of cells. The system offers a high run-time configurability, which reduces the need for resynthesizing the system. In addition, the simulator features configurable on- and off-chip communication latencies as well as neuron calculation latencies. All parts of the system are generated automatically based on the neuron interconnection scheme in use. The simulator allows exploration of different system configurations, e.g. the interconnection scheme between the neurons, the intracellular concentration of different chemical compounds (ions), which affect how action potentials are initiated and propagate.

Verilog Digital System Design Zainalabedin Navabi 2005-10-24 This rigorous text shows electronics designers and students how to deploy Verilog in sophisticated digital systems design. The Second Edition is completely updated -- along with the many worked examples -- for Verilog 2001, new synthesis standards and coverage of the new OVI verification library.

Solaris Application Programming Darryl Gove 2007-12-27 Solaris™ Application Programming is a comprehensive guide to optimizing the performance of applications running in your Solaris environment. From the fundamentals of system performance to using analysis and optimization tools to their fullest, this wide-ranging resource shows developers and software architects how to get the most from Solaris systems and applications. Whether you're new to performance analysis and optimization or an experienced developer searching for the most efficient ways to solve performance issues,

this practical guide gives you the background information, tips, and techniques for developing, optimizing, and debugging applications on Solaris. The text begins with a detailed overview of the components that affect system performance. This is followed by explanations of the many developer tools included with Solaris OS and the Sun Studio compiler, and then it takes you beyond the basics with practical, real-world examples. In addition, you will learn how to use the rich set of developer tools to identify performance problems, accurately interpret output from the tools, and choose the smartest, most efficient approach to correcting specific problems and achieving maximum system performance. Coverage includes A discussion of the chip multithreading (CMT) processors from Sun and how they change the way that developers need to think about performance A detailed introduction to the performance analysis and optimization tools included with the Solaris OS and Sun Studio compiler Practical examples for using the developer tools to their fullest, including informational tools, compilers, floating point optimizations, libraries and linking, performance profilers, and debuggers Guidelines for interpreting tool analysis output Optimization, including hardware performance counter metrics and source code optimizations Techniques for improving application performance using multiple processes, or multiple threads An overview of hardware and software components that affect system performance, including coverage of SPARC and x64 processors **Applied Reconfigurable Computing. Architectures, Tools, and Applications** Nikolaos Voros 2018-04-25 This book constitutes the proceedings of the 14th International Conference on Applied Reconfigurable Computing, ARC 2018, held in Santorini, Greece, in May 2018. The 29 full papers and 22 short presented in this volume were carefully reviewed and selected from 78 submissions. In addition, the volume contains 9 contributions from research projects. The papers were organized in topical sections named: machine learning and neural networks; FPGA-based design and CGRA optimizations;

applications and surveys; fault-tolerance, security and communication architectures; reconfigurable and adaptive architectures; design methods and fast prototyping; FPGA-based design and applications; and special session: research projects.

Food Ethics Louis P. Pojman 2016-01-01 FOOD ETHICS, 2E explores the ethical choices we make each time we eat. With twenty-six readings that bring together a diverse group of voices, this textbook dives into issues such as genetically modified foods, animal rights, population and consumption, the food industry's impact on pollution, centralized versus localized production, and more. In addition, this edition includes new introduction, new readings, a comprehensive index, and study questions that frame these significant issues for discussion and reflection. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Comprehensive Functional Verification Bruce Wile 2005-05-26 One of the biggest challenges in chip and system design is determining whether the hardware works correctly. That is the job of functional verification engineers and they are the audience for this comprehensive text from three top industry professionals. As designs increase in complexity, so has the value of verification engineers within the hardware design team. In fact, the need for skilled verification engineers has grown dramatically--functional verification now consumes between 40 and 70% of a project's labor, and about half its cost. Currently there are very few books on verification for engineers, and none that cover the subject as comprehensively as this text. A key strength of this book is that it describes the entire verification cycle and details each stage. The organization of the book follows the cycle, demonstrating how functional verification engages all aspects of the overall design effort and how individual cycle stages relate to the larger design process. Throughout the text, the authors leverage their 35 plus years experience in functional verification,

providing examples and case studies, and focusing on the skills, methods, and tools needed to complete each verification task. Comprehensive overview of the complete verification cycle Combines industry experience with a strong emphasis on functional verification fundamentals Includes real-world case studies

Exploring the Raspberry Pi 2 with C++ Warren Gay 2015-11-26 You have a Pi 2, but what exactly can you do with it? This book takes you on a tour of the Pi 2 hardware and all of the fantastic things that you can do to create innovative and useful projects with your Pi. Start with creating a workstation that does actual work, and move into installing a custom kernel, creating a clock, learning the ins and outs of the GPIO interface, and pick up some useful C++ skills along the way. Warren Gay, author of *Mastering the Raspberry Pi*, takes you through a set of experiments to show just what the Pi 2 is capable of and how you can use it to make your own fantastic creations. **What You Will Learn:** How to create an experimenter's workstation for the Pi 2, complete with breadboard and even Arduino All the details of GPIO, including a custom command for working with it Useful projects like a general purpose clock and the PiSpy Quick intro to C++ for the Pi How to make a multi-core webserver **Who this book is for:**Intermediate electronics enthusiasts and Pi fans, makers, students, teachers, and everyone who wants to know how to make the Pi really work.

Assertion-Based Design Harry D. Foster 2012-12-06 There is much excitement in the design and verification community about assertion-based design. The question is, who should study assertion-based design? The emphatic answer is, both design and verification engineers. What may be unintuitive to many design engineers is that adding assertions to RTL code will actually reduce design time, while better documenting design intent. Every design engineer should read this book! Design engineers that add assertions to their design will not only reduce the time needed to complete a design, they will also reduce

the number of interruptions from verification engineers to answer questions about design intent and to address verification suite mistakes. With design assertions in place, the majority of the interruptions from verification engineers will be related to actual design problems and the error feedback provided will be more useful to help identify design flaws. A design engineer who does not add assertions to the RTL code will spend more time with verification engineers explaining the design functionality and intended interface requirements, knowledge that is needed by the verification engineer to complete the job of testing the design.

A Verilog HDL Primer Jayaram Bhasker 2005-01-01

Tagged Arithmetic Paula J. Bettinger 1969 Tagged arithmetic system for use with FORTRAN programs.

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.

Writing Testbenches: Functional Verification of HDL Models Janick Bergeron 2012-12-06 mental improvements during the same period. What is clearly needed in verification techniques and technology is the equivalent of a synthesis productivity breakthrough. In the second edition of Writing Testbenches, Bergeron raises the verification level of abstraction by introducing coverage-driven constrained-random transaction-level self-checking testbenches all made possible through the introduction of hardware verification languages (HVLs), such as e from Verisity and OpenVera from Synopsys. The state-of-art methodologies described in Writing Test benches will contribute greatly to the much-needed equivalent of a synthesis breakthrough in verification productivity. I not only highly recommend this book, but also I think it should be required reading by anyone involved in design and verification of today’s ASIC, SoCs and systems. Harry Foster Chief Architect Verplex Systems, Inc. xviii Writing Testbenches: Functional Verification of HDL Models PREFACE If you survey hardware design groups, you will learn that between 60% and 80% of their effort is now

dedicated to verification.

Bioelectromagnetism Jaakko Malmivuo 1995 This text applies engineering science and technology to biological cells and tissues that are electrically conducting and excitable. It describes the theory and a wide range of applications in both electric and magnetic fields.

Digital Design William J. Dally 2012-09-17 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.

Op Amps for Everyone Ron Mancini 2003 The operational amplifier ("op amp") is the most versatile and widely used type of analog IC, used in audio and voltage amplifiers, signal conditioners, signal converters, oscillators, and analog computing systems. Almost every electronic device uses at least one op amp. This book is Texas Instruments' complete professional-level tutorial and reference to operational amplifier theory and applications. Among the topics covered are basic op amp physics (including reviews of current and voltage division, Thevenin's theorem, and transistor models), idealized op amp operation and configuration, feedback theory and methods, single and dual supply operation, understanding op amp parameters, minimizing noise in op amp circuits, and practical applications such as instrumentation amplifiers, signal conditioning, oscillators, active filters, load and level conversions, and analog computing. There is also extensive coverage of circuit construction techniques, including circuit board design, grounding, input and output isolation, using decoupling capacitors, and frequency characteristics of passive components. The material in this book is applicable to all op amp ICs from all manufacturers, not just TI. Unlike textbook treatments of op amp theory that tend to focus on idealized op amp models and configuration, this title uses idealized models only when necessary to explain op amp theory. The bulk of

this book is on real-world op amps and their applications; considerations such as thermal effects, circuit noise, circuit buffering, selection of appropriate op amps for a given application, and unexpected effects in passive components are all discussed in detail. *Published in conjunction with Texas Instruments *A single volume, professional-level guide to op amp theory and applications *Covers circuit board layout techniques for manufacturing op amp circuits.

The Design Warrior's Guide to FPGAs Clive Maxfield 2004-06-16 Field Programmable Gate Arrays (FPGAs) are devices that provide a fast, low-cost way for embedded system designers to customize products and deliver new versions with upgraded features, because they can handle very complicated functions, and be reconfigured an infinite number of times. In addition to introducing the various architectural features available in the latest generation of FPGAs, The Design Warrior's Guide to FPGAs also covers different design tools and flows. This book covers information ranging from schematic-driven entry, through traditional HDL/RTL-based simulation and logic synthesis, all the way up to the current state-of-the-art in pure C/C++ design capture and synthesis technology. Also discussed are specialist areas such as mixed hardware/software and DSP-based design flows, along with innovative new devices such as field programmable node arrays (FPNAs). Clive "Max" Maxfield is a bestselling author and engineer with a large following in the electronic design automation (EDA) and embedded systems industry. In this comprehensive book, he covers all the issues of interest to designers working with, or contemplating a move to, FPGAs in their product designs. While other books cover fragments of FPGA technology or applications this is the first to focus exclusively and comprehensively on FPGA use for embedded systems. First book to focus exclusively and comprehensively on FPGA use in embedded designs World-renowned best-selling author Will help engineers get familiar and succeed with this new technology by providing much-needed advice on choosing the right FPGA for any design project

Nanoelectronic Mixed-Signal System Design Saraju Mohanty 2015-02-20

Covering both the classical and emerging nanoelectronic technologies being used in mixed-signal design, this book addresses digital, analog, and memory components. Winner of the Association of American Publishers' 2016 PROSE Award in the Textbook/Physical Sciences & Mathematics category.

Nanoelectronic Mixed-Signal System Design offers professionals and students a unified perspective on the science, engineering, and technology behind nanoelectronics system design. Written by the director of the NanoSystem Design Laboratory at the University of North Texas, this comprehensive guide provides a large-scale picture of the design and manufacturing aspects of nanoelectronic-based systems. It features dual coverage of mixed-signal circuit and system design, rather than just digital or analog-only. Key topics such as process variations, power dissipation, and security aspects of electronic system design are discussed. Top-down analysis of all stages--from design to manufacturing Coverage of current and developing nanoelectronic technologies--not just nano-CMOS Describes the basics of nanoelectronic technology and the structure of popular electronic systems Reveals the techniques required for design excellence and manufacturability

Radar Technology Guy Kouemou 2010-01-01 In this book “Radar

Technology”, the chapters are divided into four main topic areas: Topic area 1: “Radar Systems” consists of chapters which treat whole radar systems, environment and target functional chain. Topic area 2: “Radar Applications” shows various applications of radar systems, including meteorological radars, ground penetrating radars and glaciology. Topic area 3: “Radar Functional Chain and Signal Processing” describes several aspects of the radar signal processing. From parameter extraction, target detection over tracking and classification technologies. Topic area 4: “Radar Subsystems and Components” consists of design technology of radar subsystem components like antenna design or waveform design.

Digital Design with Chisel Martin Schoeberl 2019-08-30 This book is an

introduction into digital design with the focus on using the hardware construction language Chisel. Chisel brings advances from software engineering, such as object-orientated and functional languages, into digital design. This book addresses hardware designers and software engineers. Hardware designers, with knowledge of Verilog or VHDL, can upgrade their productivity with a modern language for their next ASIC or FPGA design. Software engineers, with knowledge of object-oriented and functional programming, can leverage their knowledge to program hardware, for example, FPGA accelerators executing in the cloud. The approach of this book is to present small to medium-sized typical hardware components to explore digital design with Chisel.

SPECC: Specification Language and Methodology Daniel D. Gajski 2000-03-31 Each model is described and guidelines are given for generating these models from executable specifications. Finally, the Spec C methodology is demonstrated on an industrial-size example. The design community is now entering the system level of abstraction era and Spec C is the enabling element to achieve a paradigm shift in design culture needed for system/product design and manufacturing.”.

Introduction to Power Electronics D. Fewson 1998-03-27 Building on solid state device and electromagnetic contributions to the series, this text book introduces modern power electronics, that is the application of semiconductor devices to the control and conversion of electrical power. The increased availability of solid state power switches has created a very rapid expansion in applications, from the relatively low power control of domestic equipment, to high power control of industrial processes and very high power control along transmission lines. This text provides a comprehensive introduction to the entire range of devices and examines their applications, assuming only the minimum mathematical and electronic background. It covers a full year's

course in power electronics. Numerous exercises, worked examples and self assessments are included to facilitate self study and distance learning.

The SPARC Architecture Manual David L. Weaver 1994 SPARC (Scalable Processor Architecture) is the industry's only openly defined and evolved RISC architecture. Version 9 is the new 64-bit incarnation of SPARC - the most significant change since SPARC's introduction in 1987! Unlike other RISC (Reduced Instruction Set Computer) designs, SPARC specifies not a hardware implementation ("chip"), but an open, standard architecture belonging to the community of SPARC vendors and users. The SPARC specification is defined by the SPARC Architecture Committee, a technical arm of the computer-maker consortium, SPARC International. Version 9 provides 64-bit data and addressing, support for fault tolerance, fast context switching, support for advanced compiler optimizations, efficient design for Superscalar processors, and a clean structure for modern operating systems. The V9 architecture supplements, rather than replaces, the 32-bit Version 8 architecture. The non-privileged features of Version 9 are upward-compatible from Version 8, so 32-bit application software can execute natively, without modification, on Version 9 systems - no special "compatibility mode" is required. Publication of the Version 9 architecture marks a three-year development effort by SPARC International member companies from a broad cross-section of disciplines.

SystemVerilog for Verification Chris Spear 2012-02-14 Based on the highly successful second edition, this extended edition of SystemVerilog for Verification: A Guide to Learning the Testbench Language Features teaches all verification features of the SystemVerilog language, providing hundreds of examples to clearly explain the concepts and basic fundamentals. It contains materials for both the full-time verification engineer and the student learning this valuable skill. In the third edition, authors Chris Spear and Greg Tumbush start with how to verify a design, and then use that context to

demonstrate the language features, including the advantages and disadvantages of different styles, allowing readers to choose between alternatives. This textbook contains end-of-chapter exercises designed to enhance students' understanding of the material. Other features of this revision include: New sections on static variables, print specifiers, and DPI from the 2009 IEEE language standard Descriptions of UVM features such as factories, the test registry, and the configuration database Expanded code samples and explanations Numerous samples that have been tested on the major SystemVerilog simulators SystemVerilog for Verification: A Guide to Learning the Testbench Language Features, Third Edition is suitable for use in a one-semester SystemVerilog course on SystemVerilog at the undergraduate or graduate level. Many of the improvements to this new edition were compiled through feedback provided from hundreds of readers.

Secondary Analysis of Electronic Health Records MIT Critical Data 2016-09-09 This book trains the next generation of scientists representing different disciplines to leverage the data generated during routine patient care. It formulates a more complete lexicon of evidence-based recommendations and support shared, ethical decision making by doctors with their patients. Diagnostic and therapeutic technologies continue to evolve rapidly, and both individual practitioners and clinical teams face increasingly complex ethical decisions. Unfortunately, the current state of medical knowledge does not provide the guidance to make the majority of clinical decisions on the basis of evidence. The present research infrastructure is inefficient and frequently produces unreliable results that cannot be replicated. Even randomized controlled trials (RCTs), the traditional gold standards of the research reliability hierarchy, are not without limitations. They can be costly, labor intensive, and slow, and can return results that are seldom generalizable to every patient population. Furthermore, many pertinent but unresolved clinical and medical systems issues do not seem to have attracted the interest

of the research enterprise, which has come to focus instead on cellular and molecular investigations and single-agent (e.g., a drug or device) effects. For clinicians, the end result is a bit of a “data desert” when it comes to making decisions. The new research infrastructure proposed in this book will help the medical profession to make ethically sound and well informed decisions for their patients.

Processor and System-on-Chip Simulation Rainer Leupers 2010-09-15

Simulation of computer architectures has made rapid progress recently. The primary application areas are hardware/software performance estimation and optimization as well as functional and timing verification. Recent, innovative technologies such as retargetable simulator generation, dynamic binary translation, or sampling simulation have enabled widespread use of processor and system-on-chip (SoC) simulation tools in the semiconductor and embedded system industries. Simultaneously, processor and SoC simulation is still a very active research area, e.g. what amounts to higher simulation speed, flexibility, and accuracy/speed trade-offs. This book presents and discusses the principle technologies and state-of-the-art in high-level hardware architecture simulation, both at the processor and the system-on-chip level.

Building Embedded Linux Systems Karim Yaghmour 2003-04-22 Linux® is being adopted by an increasing number of embedded systems developers, who have been won over by its sophisticated scheduling and networking, its cost-free license, its open development model, and the support offered by rich and powerful programming tools. While there is a great deal of hype surrounding the use of Linux in embedded systems, there is not a lot of practical information. *Building Embedded Linux Systems* is the first in-depth, hard-core guide to putting together an embedded system based on the Linux kernel. This indispensable book features arcane and previously undocumented procedures for: Building your own GNU development toolchain Using an efficient embedded development framework Selecting, configuring, building,

and installing a target-specific kernel Creating a complete target root filesystem Setting up, manipulating, and using solid-state storage devices Installing and configuring a bootloader for the target Cross-compiling a slew of utilities and packages Debugging your embedded system using a plethora of tools and techniques Details are provided for various target architectures and hardware configurations, including a thorough review of Linux's support for embedded hardware. All explanations rely on the use of open source and free software packages. By presenting how to build the operating system components from pristine sources and how to find more documentation or help, this book greatly simplifies the task of keeping complete control over one's embedded operating system, whether it be for technical or sound financial reasons. Author Karim Yaghmour, a well-known designer and speaker who is responsible for the Linux Trace Toolkit, starts by discussing the strengths and weaknesses of Linux as an embedded operating system. Licensing issues are included, followed by a discussion of the basics of building embedded Linux systems. The configuration, setup, and use of over forty different open source and free software packages commonly used in embedded Linux systems are also covered. uClibc, BusyBox, U-Boot, OpenSSH, tftpd, tftp, strace, and gdb are among the packages discussed.

Advanced Chip Design Kishore K. Mishra 2013-04-16 Designing a complex ASIC/SoC is similar to learning a new language to start with and ultimately creating a masterpiece using experience, imagination, and creativity. Digital design starts with RTL such as Verilog or VHDL, but it is only the beginning. A complete designer needs to have a good understanding of the Verilog language, digital design techniques, system architecture, IO protocols, and hardware-software interaction. Some of it will come from experience, and some will come with concerted effort. Graduating from college and entering into the world of digital system design becomes an overwhelming task, as not all the information is readily available. In this book, we have made an effort to

explain the concepts in a simple way with real-world examples in Verilog. The book is intended for digital and system design engineers with emphasis on design and system architecture. The book is broadly divided into two sections - chapters 1 through 10, focusing on the digital design aspects and chapters 11 through 20, focusing on the system aspects of chip design. This book can be used by students taking digital design and chip design courses in college and availing it as a guide in their professional careers. Chapter 3 focuses on the synthesizable Verilog constructs, with examples on reusable design (parameterized design, functions, and generate structure). Chapter 5 describes the basic concepts in digital design - logic gates, truth table, De Morgan's theorem, set-up and hold time, edge detection, and number system. Chapter 6 goes into details of digital design explaining larger building blocks such as LFSR, scrambler/descramblers, error detection and correction, parity, CRC, Gray encoding/decoding, priority encoders, 8b/10b encoding, data converters, and synchronization techniques. Chapter 7 and 8 bring in advanced concepts in chip design and architecture - clocking and reset strategy, methods to increase throughput and reduce latency, flow-control mechanisms, pipeline operation, out-of-order execution, FIFO design, state machine design, arbitration, bus interfaces, linked list structure, and LRU usage and implementation. Chapter 9 and 10 describe how to build and design ASIC/SoC. It talks about chip micro-architecture, partitioning, datapath, control logic design, and other aspects of chip design such as clock tree, reset tree, and EEPROM. It also covers good design practices, things to avoid and adopt, and best practices for high-speed design. The second part of the book is devoted to System architecture, design, and IO protocols. Chapter 11 talks about memory, memory hierarchy, cache, interrupt, types of DMA and DMA operation. There is Verilog RTL for a typical DMA controller design that explains the scatter-gather DMA concept. Chapter 12 describes hard drive, solid-state drive, DDR operation, and other parts of a system such as BIOS, OS, drivers, and

their interaction with hardware. Chapter 13 describes embedded systems and internal buses such as AHB, AXI used in embedded design. It describes the concept of transparent and non-transparent bridging. Chapter 14 and chapter 15 bring in practical aspects of chip development - testing, DFT, scan, ATPG, and detailed flow of the chip development cycle (Synthesis, Static timing, and ECO). Chapter 16 and chapter 17 are on power saving and power management protocols. Chapter 16 has a detailed description of various power savings techniques (frequency variation, clock gating, and power well isolation). Chapter 17 talks about Power Management protocols such as system S states, CPU C states, and device D states. Chapter 18 explains the architecture behind serial-bus technology, PCS, and PMA layer. It describes clocking architecture and advanced concepts such as elasticity FIFO, channel bonding (deskewing), link aggregation, and lane reversal. Chapter 19 and 20 are devoted to serial bus protocols (PCI Express, Serial ATA, USB, Thunderbolt, and Ethernet) and their operation.

Model-Driven Engineering and Software Development Slimane Hammoudi
2020-01-03 This book constitutes thoroughly revised and selected papers from the 7th International Conference on Model-Driven Engineering and Software Development, MODELSWARD 2019, held in Prague, Czech Republic, in February 2019. The 16 thoroughly revised and extended papers presented in this volume were carefully reviewed and selected from 76 submissions. They address some of the most relevant challenges being faced by researchers and practitioners in the field of model-driven engineering and software development and cover topics like language design and tooling; programming support tools; code and text generation from models, behavior modeling and analysis; model transformations and multi-view modeling; as well as applications of MDD and its related techniques to cyber-physical systems, cyber security, IoT, autonomous vehicles and healthcare.

Field-Programmable Gate Array Technology Stephen M. Trimberger

2012-12-06 Many different kinds of FPGAs exist, with different programming technologies, different architectures and different software. Field-Programmable Gate Array Technology describes the major FPGA architectures available today, covering the three programming technologies that are in use and the major architectures built on those programming technologies. The reader is introduced to concepts relevant to the entire field of FPGAs using popular devices as examples. Field-Programmable Gate Array Technology includes discussions of FPGA integrated circuit manufacturing, circuit design and logic design. It describes the way logic and interconnect are implemented in various kinds of FPGAs. It covers particular problems with

design for FPGAs and future possibilities for new architectures and software. This book compares CAD for FPGAs with CAD for traditional gate arrays. It describes algorithms for placement, routing and optimization of FPGAs. Field-Programmable Gate Array Technology describes all aspects of FPGA design and development. For this reason, it covers a significant amount of material. Each section is clearly explained to readers who are assumed to have general technical expertise in digital design and design tools. Potential developers of FPGAs will benefit primarily from the FPGA architecture and software discussion. Electronics systems designers and ASIC users will find a background to different types of FPGAs and applications of their use.