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FPGA Prototyping by VHDL Examples Pong P. Chu 2011-09-20 This book uses a "learn by doing" approach to introduce the concepts and techniques of VHDL and FPGA to designers through a series of hands-on experiments. FPGA Prototyping by VHDL Examples provides a collection of clear, easy-to-follow templates for quick code development; a large number of practical examples to illustrate and reinforce the concepts and design techniques; realistic projects that can be implemented and tested on a Xilinx prototyping board; and a thorough exploration of the Xilinx PicoBlaze soft-core microcontroller.

Field-Programmable Custom Computing Technology: Architectures, Tools, and Applications Jeffrey Arnold 2012-12-06 Field-Programmable Custom Computing Technology: Architectures, Tools, and Applications brings together in one place important contributions and up-to-date research results in this fast-moving area. In seven selected chapters, the book describes the latest advances in architectures, design methods, and applications of field-programmable devices for high-performance reconfigurable systems. The contributors to this work were selected from the leading researchers and practitioners in the field. It will be valuable to anyone working or researching in the field of custom computing technology. It serves as an excellent reference, providing insight into some of the most challenging issues being examined today.

Digital Integrated Circuits Jan M. Rabaey 1996 designer for new challenges that might be waiting around the corner. Design-oriented perspectives are advocated throughout. Design challenges and guidelines are h... The publisher, Prentice-Hall Engineering/Science/MathematicsProgressive in content and form, this practical text successfully bridges the gap between the circuit perspective and system perspective of digital integrated circuit design. Beginning with solid discussions on the operation of electronic devices and and in-depth analysis of the nucleus of digital design, the text maintains a consistent, logical flow of subject matter throughout, addressing today's most significant and compelling industry topics: the impact of interconnect, design for low power, issues

Circadian Rhythms for Future Resilient Electronic Systems Xinfei Guo 2019-06-12 This book describes methods to address wearout/aging degradations in electronic chips and systems, caused by several physical mechanisms at the device level. The authors introduce a novel technique called accelerated active self-healing, which fixes wearout issues by enabling accelerated recovery. Coverage includes recovery theory, experimental results, implementations and applications, across multiple nodes ranging from planar, FD-SOI to FinFET, based on both foundry provided models and predictive models. Presents novel techniques, tested with experiments on real hardware; Discusses circuit and system level wearout recovery implementations, many of these designs are portable and friendly to the standard design flow; Provides circuit-architecture-system infrastructures that enable the accelerated self-healing for future resilient systems; Discusses wearout issues at both transistor and interconnect level, providing solutions that apply to both; Includes coverage of resilient aspects of emerging applications such as IoT.

Design and Analysis of High Efficiency Line Drivers for xDSL Tim Piessens 2006-04-18 Design and Analysis of High Efficiency Line Drivers for xDSL covers the most important building block of an xDSL (ADSL, VDSL, ...) system: the line driver. Traditional Class AB line drivers consume more than 70% of the total power budget of state-of-the-

art ADSL modems. This book describes the main difficulties in designing line drivers for xDSL. The most important specifications are elaborated staring from the main properties of the channel and the signal properties. The traditional (class AB), state-of-the-art (class G) and future technologies (class K) are discussed. The main part of Design and Analysis of High Efficiency Line Drivers for xDSL describes the design of a novel architecture: the Self-Oscillating Power Amplifier or SOPA.

Crosstalk in Modern On-Chip Interconnects B.K. Kaushik 2016-04-06 The book provides accurate FDTD models for on-chip interconnects, covering most recent advancements in materials and design. Furthermore, depending on the geometry and physical configurations, different electrical equivalent models for CNT and GNR based interconnects are presented. Based on the electrical equivalent models the performance comparison among the Cu, CNT and GNR-based interconnects are also discussed in the book. The proposed models are validated with the HSPICE simulations. The book introduces the current research scenario in the modeling of on-chip interconnects. It presents the structure, properties, and characteristics of graphene based on-chip interconnects and the FDTD modeling of Cu based on-chip interconnects. The model considers the non-linear effects of CMOS driver as well as the transmission line effects of interconnect line that includes coupling capacitance and mutual inductance effects. In a more realistic manner, the proposed model includes the effect of width-dependent MFP of the MLGNR while taking into account the edge roughness.

Software Engineering Perspectives in Intelligent Systems Radek Silhavy 2020-12-15 This book constitutes the refereed proceedings of the 4th Computational Methods in Systems and Software 2020 (CoMeSySo 2020) proceedings. Software engineering, computer science and artificial intelligence are crucial topics for the research within an intelligent systems problem domain. The CoMeSySo 2020 conference is breaking the barriers, being held online. CoMeSySo 2020 intends to provide an international forum for the discussion of the latest high-quality research results.

Embedded SoPC Design with Nios II Processor and Verilog Examples Pong P. Chu 2012-05-14 Explores the unique hardware programmability of FPGA-based embedded systems, using a learn-by-doing approach to introduce the concepts and techniques for embedded SoPC design with Verilog An SoPC (system on a programmable chip) integrates a processor, memory modules, I/O peripherals, and custom hardware accelerators into a single FPGA (field-programmable gate array) device. In addition to the customized software, customized hardware can be developed and incorporated into the embedded system as well—allowing us to configure the soft-core processor, create tailored I/O interfaces, and develop specialized hardware accelerators for computation-intensive tasks. Utilizing an Altera FPGA prototyping board and its Nios II soft-core processor, Embedded SoPC Design with Nios II Processor and Verilog Examples takes a "learn by doing" approach to illustrate the hardware and software design and development process by including realistic projects that can be implemented and tested on the board. Emphasizing hardware design and integration throughout, the book is divided into four major parts: Part I covers HDL and synthesis of custom hardware Part II introduces the Nios II processor and provides an overview of embedded software development Part III demonstrates the design and development of hardware and software of several complex I/O peripherals, including a PS2 keyboard and mouse, a graphic video controller, an audio codec, and an SD (secure digital) card Part IV provides several case studies of the integration of hardware accelerators, including a custom GCD (greatest common divisor) circuit, a Mandelbrot set fractal circuit, and an audio synthesizer based on DDFS (direct digital frequency synthesis) methodology While designing and developing an embedded SoPC can be rewarding, the learning can be a long and winding journey. This book shows the trail ahead and guides readers through the initial steps to exploit the full potential of this emerging methodology.

Efficient Design of Variation-Resilient Ultra-Low Energy Digital Processors Hans Reyserhove 2019-03-27 This book enables readers to achieve ultra-low energy digital system performance. The author's main focus is the energy consumption of microcontroller architectures in digital (sub)-systems. The book covers a broad range of topics extensively: from circuits through design strategy to system architectures. The result is a set of techniques and a context to realize minimum energy digital systems. Several prototype silicon implementations are discussed, which put the proposed techniques to the test. The achieved results demonstrate an extraordinary combination of variation-resilience, high speed performance and ultra-low energy.

Secure Smart Embedded Devices, Platforms and Applications Konstantinos Markantonakis 2013-09-14 New generations of IT users are increasingly abstracted from the underlying devices and platforms that provide and

safeguard their services. As a result they may have little awareness that they are critically dependent on the embedded security devices that are becoming pervasive in daily modern life. Secure Smart Embedded Devices, Platforms and Applications provides a broad overview of the many security and practical issues of embedded devices, tokens, and their operation systems, platforms and main applications. It also addresses a diverse range of industry/government initiatives and considerations, while focusing strongly on technical and practical security issues. The benefits and pitfalls of developing and deploying applications that rely on embedded systems and their security functionality are presented. A sufficient level of technical detail to support embedded systems is provided throughout the text, although the book is quite readable for those seeking awareness through an initial overview of the topics. This edited volume benefits from the contributions of industry and academic experts and helps provide a cross-discipline overview of the security and practical issues for embedded systems, tokens, and platforms. It is an ideal complement to the earlier work, Smart Cards Tokens, Security and Applications from the same editors.

Embedded Cryptographic Hardware Nadia Nedjah 2005 Data security is an important requirement for almost all, if not all, information-oriented applications such as e-commerce, digital signature, secure Internet, etc. All these services use encrypted data. Cryptography is a milliner science that was the key to the secret of ancient Rome and a fundamental piece in the Second World War. Today, it is a star in the computation world. Several operating systems, data base systems or simple filling systems provide the user with cryptographic functions that allow controlled data scrambling. Modern cryptology, which is the basis of information security techniques, started in the late 1970's and developed in the 1980's. As communication networks were spreading deep into society, the need for secure communication greatly promoted cryptographic research. The need for fast but secure cryptographic systems is growing bigger. Therefore, dedicated hardware for cryptography is becoming a key issue for designers. With the spread of reconfigurable hardware such as FPGAs, hardware implementations of cryptographic algorithms became cost-effective. The focus of this book is on all aspects of cryptographic hardware and embedded systems. This includes design, implementation and security of such systems. The content of this book is divided into four main parts, each of which is organised in three chapters, with the exception of the last one.

Performance Optimization Techniques in Analog, Mixed-Signal, and Radio-Frequency Circuit Design Fakhfakh, Mourad 2014-10-31 Improving the performance of existing technologies has always been a focal practice in the development of computational systems. However, as circuitry is becoming more complex, conventional techniques are becoming outdated and new research methodologies are being implemented by designers. Performance Optimization Techniques in Analog, Mix-Signal, and Radio-Frequency Circuit Design features recent advances in the engineering of integrated systems with prominence placed on methods for maximizing the functionality of these systems. This book emphasizes prospective trends in the field and is an essential reference source for researchers, practitioners, engineers, and technology designers interested in emerging research and techniques in the performance optimization of different circuit designs.

Power Aware Computing Robert Graybill 2013-04-17 With the advent of portable and autonomous computing systems, power con sumption has emerged as a focal point in many research projects, commercial systems and DoD platforms. One current research initiative, which drew much attention to this area, is the Power Aware Computing and Communications (PAC/C) program sponsored by DARPA. Many of the chapters in this book include results from work that have been supported by the PACIC program. The performance of computer systems has been tremendously improving while the size and weight of such systems has been constantly shrinking. The capacities of batteries relative to their sizes and weights has been also improv ing but at a rate which is much slower than the rate of improvement in computer performance and the rate of shrinking in computer sizes. The relation between the power consumption of a computer system and it performance and size is a complex one which is very much dependent on the specific system and the technology used to build that system. We do not need a complex argument, however, to be convinced that energy and power, which is the rate of energy consumption, are becoming critical components in computer systems in gen eral, and portable and autonomous systems, in particular. Most of the early research on power consumption in computer systems ad dressed the issue of minimizing power in a given platform, which usually translates into minimizing energy consumption, and thus, longer battery life.

Wireless Communications Circuits and Systems Institution of Electrical Engineers 2004 This book examines integrated circuits, systems and transceivers for wireless and mobile communications. It covers the most recent developments in key RF, IF, analogue, mixed-signal components and single-chip transceivers in CMOS technology.

Embedded SoPC Design with Nios II Processor and VHDL Examples Pong P. Chu 2011-09-26 The book is divided into four major parts. Part I covers HDLconstructs and synthesis of basic digital circuits. Part IIprovides an overview of embedded software development with theemphasis on low-level I/O access and drivers. Part III demonstratesthe design and development of hardware and software for severalcomplex I/O peripherals, including PS2 keyboard and mouse, agraphic video controller, an audio codec, and an SD (securedigital) card. Part IV provides three case studies of theintegration of hardware accelerators, including a custom GCD(greatest common divisor) circuit, a Mandelbrot set fractalcircuit, and an audio synthesizer based on DDFS (direct digitalfrequency synthesis) methodology. The book utilizes FPGA devices, Nios II soft-core processor, anddevelopment platform from Altera Co., which is one of the two mainFPGA manufactures. Altera has a generous university program thatprovides free software and discounted prototyping boards foreducational institutions (details at ahref="http://www.altera.com/university"spanstyle="color: #284457;"http://www.altera.com/university/span/a).The two main educational prototyping boards are known as DE1 ($99)and DE2 ($269). All experiments can be implemented and tested withthese boards. A board combined with this book becomes a"turn-key" solution for the SoPC design experiments andprojects. Most HDL and C codes in the book are device independentand can be adapted by other prototyping boards as long as a boardhas similar I/O configuration.

Cryptographic Engineering Cetin Kaya Koc 2008-12-11 This book is for engineers and researchers working in the embedded hardware industry. This book addresses the design aspects of cryptographic hardware and embedded software. The authors provide tutorial-type material for professional engineers and computer information specialists.

Design of 3D Integrated Circuits and Systems Rohit Sharma 2018-09-03 Three-dimensional (3D) integration of microsystems and subsystems has become essential to the future of semiconductor technology development. 3D integration requires a greater understanding of several interconnected systems stacked over each other. While this vertical growth profoundly increases the system functionality, it also exponentially increases the design complexity. Design of 3D Integrated Circuits and Systems tackles all aspects of 3D integration, including 3D circuit and system design, new processes and simulation techniques, alternative communication schemes for 3D circuits and systems, application of novel materials for 3D systems, and the thermal challenges to restrict power dissipation and improve performance of 3D systems. Containing contributions from experts in industry as well as academia, this authoritative text: Illustrates different 3D integration approaches, such as die-to-die, die-to-wafer, and wafer-to-wafer Discusses the use of interposer technology and the role of Through-Silicon Vias (TSVs) Presents the latest improvements in three major fields of thermal management for multiprocessor systems-on-chip (MPSoCs) Explores ThruChip Interface (TCI), NAND flash memory stacking, and emerging applications Describes large-scale integration testing and state-of-the-art low-power testing solutions Complete with experimental results of chip-level 3D integration schemes tested at IBM and case studies on advanced complementary metal–oxide–semiconductor (CMOS) integration for 3D integrated circuits (ICs), Design of 3D Integrated Circuits and Systems is a practical reference that not only covers a wealth of design issues encountered in 3D integration but also demonstrates their impact on the efficiency of 3D systems.

Wafer-Level Testing and Test During Burn-In for Integrated Circuits Sudarshan Bahukudumbi 2010 Wafer-level testing refers to a critical process of subjecting integrated circuits and semiconductor devices to electrical testing while they are still in wafer form. Burn-in is a temperature/bias reliability stress test used in detecting and screening out potential early life device failures. This hands-on resource provides a comprehensive analysis of these methods, showing how wafer-level testing during burn-in (WLTBI) helps lower product cost in semiconductor manufacturing. Engineers learn how to implement the testing of integrated circuits at the wafer-level under various resource constraints. Moreover, this unique book helps practitioners address the issue of enabling next generation products with previous generation testers. Practitioners also find expert insights on current industry trends in WLTBI test solutions.

A Computer-Aided Design and Synthesis Environment for Analog Integrated Circuits Geert Van der Plas 2002-04-30 This text addresses the design methodologies and CAD tools available for the systematic design and design automation of analogue integrated circuits. Two complementary approaches discussed increase analogue design productivity, demonstrated throughout using design times of the different design experiments undertaken.

Proceedings of the Third International Conference on Trends in Information, Telecommunication and Computing Vinu V. Das 2012-09-14 Third International Conference on Recent Trends in Information, Telecommunication and Computing – ITC 2012. ITC 2012 will be held during Aug 03-04, 2012, Kochi, India. ITC 2012, is to bring together innovative academics and industrial experts in the field of Computer Science, Information Technology, Computational Engineering, and Communication to a common forum. The primary goal of the conference is to promote research and developmental activities in Computer Science, Information Technology, Computational Engineering, and Communication. Another goal is to promote scientific information interchange between researchers, developers, engineers, students, and practitioners.

Low Power Design in Deep Submicron Electronics W. Nebel 2013-06-29 Low Power Design in Deep Submicron Electronics deals with the different aspects of low power design for deep submicron electronics at all levels of abstraction from system level to circuit level and technology. Its objective is to guide industrial and academic engineers and researchers in the selection of methods, technologies and tools and to provide a baseline for further developments. Furthermore the book has been written to serve as a textbook for postgraduate student courses. In order to achieve both goals, it is structured into different chapters each of which addresses a different phase of the design, a particular level of abstraction, a unique design style or technology. These design-related chapters are amended by motivations in Chapter 2, which presents visions both of future low power applications and technology advancements, and by some advanced case studies in Chapter 9. From the Foreword: '... This global nature of design for low power was well understood by Wolfgang Nebel and Jean Mermet when organizing the NATO workshop which is the origin of the book. They invited the best experts in the field to cover all aspects of low power design. As a result the chapters in this book are covering deep-submicron CMOS digital system design for low power in a systematic way from process technology all the way up to software design and embedded software systems. Low Power Design in Deep Submicron Electronics is an excellent guide for the practicing engineer, the researcher and the student interested in this crucial aspect of actual CMOS design. It contains about a thousand references to all aspects of the recent five years of feverish activity in this exciting aspect of design.' Hugo de Man Professor, K.U. Leuven, Belgium Senior Research Fellow, IMEC, Belgium

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

Custom Memory Management Methodology Francky Catthoor 2013-03-09 The main intention of this book is to give an impression of the state-of-the-art in system-level memory management (data transfer and storage) related issues for complex data-dominated real-time signal and data processing applications. The material is based on research at IMEC in this area in the period 1989- 1997. In order to deal with the stringent timing requirements and the data dominated characteristics of this domain, we have adopted a target architecture style and a systematic methodology to make the exploration and optimization of such systems feasible. Our approach is also very heavily application driven which is illustrated by several realistic demonstrators, partly used as red-thread examples in the book. Moreover, the book addresses only the steps above the traditional high-level synthesis (scheduling and allocation) or compilation (traditional or ILP oriented) tasks. The latter are mainly focussed on scalar or scalar stream operations and data where the internal structure of the complex data types is not exploited, in contrast to the approaches discussed here. The proposed methodologies are largely independent of the level of

programmability in the data-path and controller so they are valuable for the realisation of both hardware and software systems. Our target domain consists of signal and data processing systems which deal with large amounts of data.

Field Programmable Logic and Applications Patrick Lysaght 2004-06-22 This book contains the papers presented at the 9th International Workshop on Field ProgrammableLogic and Applications (FPL'99), hosted by the University of Strathclyde in Glasgow, Scotland, August 30 – September 1, 1999. FPL'99 is the ninth in the series of annual FPL workshops. The FPL'99 programme committee has been fortunate to have received a large number of high-quality papers addressing a wide range of topics. From these, 33 papers have been selected for presentation at the workshop and a further 32 papers have been accepted for the poster sessions. A total of 65 papers from 20 countries are included in this volume. FPL is a subject area that attracts researchers from both electronic engine- ing and computer science. Whether we are engaged in research into soft ha- ware or hard software seems to be primarily a question of perspective. What is unquestionable is that the interaction of groups of researchers from di?erent backgrounds results in stimulating and productive research. As we prepare for the new millennium, the premier European forum for - searchers in ?eld programmable logic remains the FPL workshop. Next year the FPL series of workshopswill celebrate its tenth anniversary.The contribution of so many overseas researchers has been a particularly attractive feature of these events, giving them a truly international perspective, while the informal and convivial atmosphere that pervades the workshops have been their hallmark. We look forward to preserving these features in the future while continuing to expand the size and quality of the events.

Micro-Relay Technology for Energy-Efficient Integrated Circuits Hei Kam 2014-10-16 This volume describes the design of relay-based circuit systems from device fabrication to circuit micro-architectures. This book is ideal for both device engineers as well as circuit system designers, and highlights the importance of co-design across design hierarchies when trying to optimize system performance (in this case, energy-efficiency). The book will also appeal to researchers and engineers focused on semiconductor, integrated circuits, and energy efficient electronics.

ZnO Thin-Film Transistors for Cost-Efficient Flexible Electronics F? bio Fedrizzi Vidor 2017-12-28 This book describes the integration, characterization and analysis of cost-efficient thin-film transistors (TFTs), applying zinc oxide as active semiconductors. The authors discuss soluble gate dielectrics, ZnO precursors, and dispersions containing nanostructures of the material, while different transistor configurations are analyzed with respect to their integration, compatibility, and device performance. Additionally, simple circuits (inverters and ring oscillators) and a complementary design employing (in)organic semiconducting materials are presented and discussed. Readers will benefit from concise information on cost-efficient materials and processes, applied in flexible and transparent electronic technology, such as the use of solution-based materials and dispersion containing nanostructures, as well as discussion of the physical fundamentals responsible for the operation of the thin-film transistors and the non-idealities of the device.

Quantifying and Exploring the Gap Between FPGAs and ASICs Ian Kuon 2010-07-03 Field-programmable gate arrays (FPGAs), which are pre-fabricated, programmable digital integrated circuits (ICs), provide easy access to state-of-the-art integrated circuit process technology, and in doing so, democratize this technology of our time. This book is about comparing the qualities of FPGA – their speed performance, area and power consumption, against custom-fabricated ICs, and exploring ways of mitigating their de ciencies. This work began as a question that many have asked, and few had the resources to answer – how much worse is an FPGA compared to a custom-designed chip? As we dealt with that question, we found that it was far more dif cult to answer than we anticipated, but that the results were rich basic insights on fundamental understandings of FPGA architecture. It also encouraged us to nd ways to leverage those insights to seek ways to make FPGA technology better, which is what the second half of the book is about. While the question "How much worse is an FPGA than an ASIC?" has been a constant sub-theme of all research on FPGAs, it was posed most directly, some time around May 2004, by Professor Abbas El Gamal from Stanford University to us – he was working on a 3D FPGA, and was wondering if any real measurements had been made in this kind of comparison. Shortly thereafter we took it up and tried to answer in a serious way.

Brutal Uday Satpathy 2015

Ultra-Low-Voltage Design of Energy-Efficient Digital Circuits Nele Reynders 2015-04-14 This book focuses on

increasing the energy-efficiency of electronic devices so that portable applications can have a longer stand-alone time on the same battery. The authors explain the energy-efficiency benefits that ultra-low-voltage circuits provide and provide answers to tackle the challenges which ultra-low-voltage operation poses. An innovative design methodology is presented, verified, and validated by four prototypes in advanced CMOS technologies. These prototypes are shown to achieve high energy-efficiency through their successful functionality at ultra-low supply voltages.

Materials for Information Technology Ehrenfried Zschech 2006-07-02 This book provides an up to date survey of the state of the art of research into the materials used in information technology, and will be bought by researchers in universities, institutions as well as research workers in the semiconductor and IT industries.

Single-chip Bluetooth Solutions Sudeepto Chakraborty 2001

International Conference on Innovative Computing and Communications Ashish Khanna 2019-11-16 This book gathers high-quality research papers presented at the Second International Conference on Innovative Computing and Communication (ICICC 2019), which was held at the VSB - Technical University of Ostrava, Czech Republic, on 21–22 March 2019. Highlighting innovative papers by scientists, scholars, students, and industry experts in the fields of computing and communication, the book promotes the transformation of fundamental research into institutional and industrialized research, and the translation of applied research into real-world applications.

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

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

Recent Progress in the Boolean Domain Bernd Steinbach 2014-04-23 In today's world, people are using more and more digital systems in daily life. Such systems utilize the elementariness of Boolean values. A Boolean variable can carry only two different Boolean values: FALSE or TRUE (0 or 1), and has the best interference resistance in technical systems. However, a Boolean function exponentially depends on the number of its variables. This exponential complexity is the cause of major problems in the process of design and realization of circuits. According to Moore's Law, the complexity of digital systems approximately doubles every 18 months. This requires comprehensive knowledge and techniques to solve very complex Boolean problems. This book summarizes the recent progress in the Boolean domain in solving such issues. Part 1 describes the most powerful approaches in solving exceptionally complex Boolean problems. It is shown how an extremely rare solution could be found in a gigantic search space of more than 10^195 (this is a number of 196 decimal digits) different color patterns. Part 2 describes new research into digital circuits that realize Boolean functions. This part contains the chapters "Design" and "Test", which present solutions to problems of power dissipation, and the testing of digital circuits using a special data structure, as well as further topics. Part 3 contributes to the scientific basis of future circuit technologies, investigating the need for completely new design methods for the atomic level of quantum computers. This section also concerns itself with circuit structures in reversible logic as the basis for quantum logic.

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.

Field-Programmable Logic and Applications: Reconfigurable Computing Is Going Mainstream Manfred Glesner 2003-08-02 This book constitutes the refereed proceedings of the 12th International Conference on Field-Programmable Logic and Applications, FPL 2002, held in Montpellier, France, in September 2002. The 104 revised regular papers and 27 poster papers presented together with three invited contributions were carefully reviewed and selected from 214 submissions. The papers are organized in topical sections on rapid prototyping, FPGA synthesis, custom computing engines, DSP applications, reconfigurable fabrics, dynamic reconfiguration, routing and placement, power estimation, synthesis issues, communication applications, new technologies, reconfigurable architectures, multimedia applications, FPGA-based arithmetic, reconfigurable processors, testing and fault-tolerance, crypto applications, multitasking, compilation techniques, etc.

Integrated Circuit and System Design. Power and Timing Modeling, Optimization and Simulation Vassilis Paliouras 2005-08-25 Welcome to the proceedings of PATMOS 2005, the 15th in a series of international workshops.PATMOS2005wasorganizedbyIMECwithtechnicalco-sponsorshipfrom the IEEE Circuits and Systems Society. Over the years, PATMOS has evolved into an important European event, where - searchers from both industry and academia discuss and investigate the emerging ch- lenges in future and contemporary applications, design methodologies, and tools - quired for the developmentof upcominggenerationsof integrated circuits and systems. The technical program of PATMOS 2005 contained state-of-the-art technical contri- tions, three invited talks, a special session on hearing-aid design, and an embedded - torial. The technical program focused on timing, performance and power consumption, as well as architectural aspects with particular emphasis on modeling, design, char- terization, analysis and optimization in the nanometer era. The Technical Program Committee, with the assistance of additional expert revi- ers, selected the 74 papers to be presented at PATMOS. The papers were divided into 11 technical sessions and 3 poster sessions. As is always the case with the PATMOS workshops, the review process was anonymous, full papers were required, and several reviews were carried out per paper. Beyond the presentations of the papers, the PATMOS technical program was - riched by a series of speeches offered by world class experts, on important emerging research issues of industrial relevance. Prof. Jan Rabaey, Berkeley, USA, gave a talk on "Traveling the Wild Frontier of Ulta Low-Power Design", Dr. Sung Bae Park, S- sung, gave a presentation on "DVL (Deep Low Voltage): Circuits and Devices", Prof.

Processor Design Jari Nurmi 2007-07-26 Here is an extremely useful book that provides insight into a number of different flavors of processor architectures and their design, software tool generation, implementation, and verification. After a brief introduction to processor architectures and how processor designers have sometimes failed to deliver what was expected, the authors introduce a generic flow for embedded on-chip processor design and start to explore the vast design space of on-chip processing. The authors cover a number of different types of processor core.

Design and Test Technology for Dependable Systems-on-chip Raimund Ubar 2011-01-01 "This book covers aspects of system design and efficient modelling, and also introduces various fault models and fault mechanisms associated with digital circuits integrated into System on Chip (SoC), Multi-Processor System-on Chip (MPSoC) or Network on Chip (NoC)"--