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Computer Aids for VLSI Design VLSI Design Multi-Level Simulation for VLSI Design VLSI Design Reuse Techniques for VLSI Design VLSI Design Algorithms for VLSI Design Automation VLSI CAD Tools and Applications Advanced Simulation and Test Methodologies for VLSI Design Simulated Annealing for VLSI Design VLSI Design Environments ALGORITHMS VLSI DESIGN AUTOMATION Formal Verification VLSI Design Digital VLSI Design and Simulation with Verilog A Practical Approach to VLSI System on Chip (SoC) Design Algorithms for VLSI Physical Design Automation VLSI Design Modern VLSI Design Layout Optimization in VLSI Design Simulated Annealing for VLSI Design Design Automation Trace Theory and VLSI Design Introduction to VLSI Design Introduction to VLSI Design Low Power VLSI Design and Technology Digital VLSI Design with Verilog Basic VLSI Design Technology Low-Power Digital VLSI Design Low Power VLSI Design Digital VLSI Design and Simulation with Verilog Digital Vlsi Design Interconnects in VLSI Design VLSI Design for Manufacturing: Yield Enhancement Compact MOSFET Models for VLSI Design VLSI Design Advanced VLSI Design and Testability Issues Modern VLSI Design Formal Aspects of VLSI Design VLSI Physical Design Automation

Computer Aids for VLSI Design

1987

this textbook originally published in 1987 broadly examines the software required to design electronic circuitry including integrated circuits topics include synthesis and analysis tools graphics and user interface memory representation and more the book also describes a real system called electric

VLSI Design

2014-12-01

vlsi electronics microstructure science volume 14 vlsi design presents a comprehensive exposition and assessment of the developments and trends in vlsi very large scale integration electronics this volume covers topics that range from microscopic aspects of materials behavior and device performance to the comprehension of vlsi in systems applications each article is prepared by a recognized authority the subjects discussed in this book include vlsi processor design methodology the risc reduced instruction set computer the vlsi testing program silicon compilers for vlsi and specialized silicon compiler and programmable chip for language recognition scientists engineers researchers device designers and systems architects will find the book very useful

Multi-Level Simulation for VLSI Design

2012-12-06

and background 1 1 cad specification and simulation computer aided design cad is today a widely used expression referring to the study of ways in which computers can be used to expedite the design process this can include the design of physical systems architectural environments manufacturing processes and many other areas this book concentrates on one area of cad the design of computer systems within this area it focusses on just two aspects of computer design the specification and the simulation of digital systems vlsi design requires support in many other cad areas induding automatic layout ic fabrication analysis test generation and others the problem of specification is unique however in that it i often the first one encountered in large chip designs and one that is unlikely ever to be completely automated this is true because until a design s objectives are specified in a machine readable form there is no way for other cad tools to verify that the target system meets them and unless the specifications can be simulated it is unlikely that designers will have confidence in them since specifications are potentially erroneous themselves in this context the term target system refers to the hardware and or software that will ultimately be fabricated on the other hand since the functionality of a vlsi chip is ultimately determined by its layout geometry one might question the need for cad tools that work with areas other than layout

VLSI Design

2011-08-23

this book provides insight into the practical design of vlsi circuits it is aimed at novice vlsi designers and other enthusiasts who would like to understand vlsi design flows coverage includes key concepts in cmos digital design design of dsp and communication blocks on fpgas asic front end and physical design and analog and mixed signal design the approach is designed to focus on practical implementation of

key elements of the vlsi design process in order to make the topic accessible to novices the design concepts are demonstrated using software from mathworks xilinx mentor graphics synopsys and cadence

Reuse Techniques for VLSI Design

2012-12-06

reuse techniques for vlsi design is a reflection on the current state of the art in design reuse for microelectronic systems to that end it is the first book to garner the input of leading experts from both research and application areas these experts document herein not only their more mature approaches but also their latest research results firstly it sets out the background and support from international organisations that enforce system on a chip soc design by reuse oriented methodologies this overview is followed by a number of technical presentations covering different requirements of the reuse domain these are presented from different points of view i e ip provider ip user designer isolated reuse intra company or inter company reuse more general systems or case studies e g metrics are followed by comprehensive reuse systems e g reuse management systems partly including business models since design reuse must not be restricted to digital components mixed signal and analog reuse approaches are also presented in parallel to the digital domain this area covers research in reuse database design design verification and legal aspects are two important topics that are closely related to the realization of design reuse these hot topics are covered by presentations that finalize the survey of outstanding research development and application of design reuse for soc design reuse techniques for vlsi design is an invaluable reference for researchers and engineers involved in vlsi asic design

VLSI Design

2017-12-19

very large scale integration vlsi has become a necessity rather than a specialization for electrical and computer engineers this unique text provides engineering and computer science students with a comprehensive study of the subject covering vlsi from basic design techniques to working principles of physical design automation tools to leading edge application specific array processors beginning with cmos design the author describes vlsi design from the viewpoint of a digital circuit engineer he develops physical pictures for cmos circuits and demonstrates the top down design methodology using two design projects a microprocessor and a field programmable gate array the author then discusses vlsi testing and dedicates an entire chapter to the working principles strengths and weaknesses of ubiquitous physical design tools finally he unveils the frontiers of vlsi he emphasizes its use as a tool to develop innovative algorithms and architecture to solve previously intractable problems vlsi design answers not only the question of what is vlsi but also shows how to use vlsi it provides graduate and upper level undergraduate students with a complete and congregated view of vlsi engineering

Algorithms for VLSI Design Automation

1999

the summer school on vlsf gad tools and applications was held from july 21 through august 1 1986 at beatenberg in the beautiful bernese oberland in switzerland the meeting was given under the auspices of ifip wg 10 6 vlsi and it was sponsored by the swiss federal institute of technology zurich switzerland eighty one

professionals were invited to participate in the summer school including 18 lecturers the 81 participants came from the following countries australia 1 denmark 1 federal republic of germany 12 france 3 italy 4 norway 1 south korea 1 sweden 5 united kingdom 1 united states of america 13 and switzerland 39 our goal in the planning for the summer school was to introduce the audience into the realities of cad tools and their applications to vlsi design this book contains articles by all 18 invited speakers that lectured at the summer school the reader should realize that it was not intended to publish a textbook however the chapters in this book are more or less self contained treatments of the particular subjects chapters 1 and 2 give a broad introduction to vlsi design simulation tools and their algorithmic foundations are treated in chapters 3 to 5 and 17 chapters 6 to 9 provide an excellent treatment of modern layout tools the use of cad tools and trends in the design of 32 bit microprocessors are the topics of chapters 10 through 16 important aspects in vlsi testing and testing strategies are given in chapters 18 and 19

VLSI CAD Tools and Applications

2012-12-06

this monograph represents a summary of our work in the last two years in applying the method of simulated annealing to the solution of problems that arise in the physical design of vlsi circuits our study is experimental in nature in that we are con cerned with issues such as solution representations neighborhood structures cost functions approximation schemes and so on in order to obtain good design results in a reasonable amount of com putation time we hope that our experiences with the techniques we employed some of which indeed bear certain similarities for different problems could be useful as hints and guides for other researchers in applying the method to the solution of other prob lems work reported in this monograph was partially supported by the national science foundation under grant mip 87 03273 by the semiconductor research corporation under contract 87 dp 109 by a grant from the general electric company and by a grant from the sandia laboratories

Advanced Simulation and Test Methodologies for VLSI Design

1989-02-28

vlsi design environments investigates design alternatives such as object oriented data modelling the difficulty of automating chip architecture designs is caused by the complexity of the problem the explosion of design decions make a heuristic approach necessary playout aims at the solution of system problems based on hierarchy top down plannin

Simulated Annealing for VLSI Design

2012-12-06

market desc electrical engineering students taking courses on vlsi systems cad tools for vlsi design automation at final year or graduate level computer science courses on the same topics at a similar level practicing engineers wishing to learn the state of the art in vlsi design automation designers of cad tools for chip design in software houses or large electronics companies special features probably the first book on design automation for vlsi systems which covers all stages of design from layout synthesis through logic synthesis to high level synthesis clear precise presentation of examples well illustrated with over 200 figures focus on algorithms

for vlsi design tools means it will appeal to some computer science as well as electrical engineering departments about the book enrollments in vlsi design automation courses are not large but it s a very popular elective especially for those seeking a career in the microelectronics industry already the reviewers seem very enthusiastic about the coverage of the book being a better match for their courses than available competitors because it covers all design phases it has plenty of worked problems and a large no of illustrations it s a good list builder title that matches our strategy of focusing on topics that lie on the interface between elec eng and computer science

VLSI Design Environments

2000-04-17

formal verification an essential toolkit for modern vlsi design second edition presents practical approaches for design and validation with hands on advice to help working engineers integrate these techniques into their work formal verification fv enables a designer to directly analyze and mathematically explore the quality or other aspects of a register transfer level rtl design without using simulations this can reduce time spent validating designs and more quickly reach a final design for manufacturing building on a basic knowledge of systemverilog this book demystifies fv and presents the practical applications that are bringing it into mainstream design and validation processes every chapter in the second edition has been updated to reflect evolving fv practices and advanced techniques in addition a new chapter formal signoff on real projects provides guidelines for implementing signoff quality fv completely replacing some simulation tasks with significantly more productive fv methods after reading this book readers will be prepared to introduce fv in their organization to effectively deploy fv techniques that increase design and validation productivity covers formal verification algorithms that help users gain full coverage without exhaustive simulation helps readers understand formal verification tools and how they differ from simulation tools shows how to create instant testbenches to gain insights into how models work and to find initial bugs presents insights from intel insiders who share their hard won knowledge and solutions to complex design problems

ALGORITHMS VLSI DESIGN AUTOMATION

2006-06

this text is intended for the undergraduate engineering students in electrical and electronics engineering electronics and communication engineering and electronics and instrumentation engineering and those pursuing postgraduate courses in applied electronics and vlsi design with the electronic devices and chips becoming smaller and smaller the sizes of circuits and transistors on the microchips are approaching atomic levels and so very large scale integration vlsi design refers to the process of placing hundreds of thousands of electronic components on a single chip which nearly all modern computer architectures employ and this technology has assumed a significant role in today s tech savvy world this well organized up to date and compact text explains the basic concepts of mos technology including the fabrication methods mos characteristic behaviour and design processes for layouts etc in a crisp and easy to learn style the latest and most advanced techniques for maximising performance minimising power consumption and achieving rapid design turnarounds are discussed with great skill by the authors key features gives an in depth analysis of mos structure device characteristics modelling and mos device fabrication techniques provides detailed description of cmos design of combinatorial sequential and arithmetic circuits with emphasis on practical applications offers an insight into

the cmos testing techniques for the design of vlsi circuits gives a number of solved problems in vhdl and verilog languages provides a number of short answer questions to help the students during examinations

Formal Verification

2023-05-26

master digital design with vlsi and verilog using this up to date and comprehensive resource from leaders in the field digital vlsi design problems and solution with verilog delivers an expertly crafted treatment of the fundamental concepts of digital design and digital design verification with verilog hdl the book includes the foundational knowledge that is crucial for beginners to grasp along with more advanced coverage suitable for research students working in the area of vlsi design including digital design information from the switch level to fpga based implementation using hardware description language hdl the distinguished authors have created a one stop resource for anyone in the field of vlsi design through eleven insightful chapters youll learn the concepts behind digital circuit design including combinational and sequential circuit design fundamentals based on boolean algebra youll also discover comprehensive treatments of topics like logic functionality of complex digital circuits with verilog using software simulators like isim of xilinx the distinguished authors have included additional topics as well like a discussion of programming techniques in verilog including gate level modeling model instantiation dataflow modeling and behavioral modeling a treatment of programmable and reconfigurable devices including logic synthesis introduction of plds and the basics of fpga architecture an introduction to system verilog including its distinct features and a comparison of verilog with system verilog a project based on verilog hdls with real time examples implemented using verilog code on an fpga board perfect for undergraduate and graduate students in electronics engineering and computer science engineering digital vlsi design problems and solution with verilogalso has a place on the bookshelves of academic researchers and private industry professionals in these fields

VLSI Design

2008-10-21

this book provides a comprehensive overview of the vlsi design process it covers end to end system on chip soc design including design methodology the design environment tools choice of design components handoff procedures and design infrastructure needs the book also offers critical guidance on the latest upf based low power design flow issues for deep submicron soc designs which will prepare readers for the challenges of working at the nanotechnology scale this practical guide will provide engineers who aspire to be vlsi designers with the techniques and tools of the trade and will also be a valuable professional reference for those already working in vlsi design and verification with a focus on complex soc designs a comprehensive practical guide for vlsi designers covers end to end vlsi soc design flow includes source code case studies and application examples

Digital VLSI Design and Simulation with Verilog

2021-10

algorithms for vlsi physical design automation second edition is a core reference text for graduate students and cad professionals based on the very successful first edition it provides a comprehensive treatment of the principles and algorithms of

vlsi physical design presenting the concepts and algorithms in an intuitive manner each chapter contains 3 4 algorithms that are discussed in detail additional algorithms are presented in a somewhat shorter format references to advanced algorithms are presented at the end of each chapter algorithms for vlsi physical design automation covers all aspects of physical design in 1992 when the first edition was published the largest available microprocessor had one million transistors and was fabricated using three metal layers now we process with six metal layers fabricating 15 million transistors on a chip designs are moving to the 500 700 mhz frequency goal these stunning developments have significantly altered the vlsi field over the cell routing and early floorplanning have come to occupy a central place in the physical design flow this second edition introduces a realistic picture to the reader exposing the concerns facing the vlsi industry while maintaining the theoretical flavor of the first edition new material has been added to all chapters new sections have been added to most chapters and a few chapters have been completely rewritten the textual material is supplemented and clarified by many helpful figures audience an invaluable reference for professionals in layout design automation and physical design

A Practical Approach to VLSI System on Chip (SoC) Design

2019-09-25

very large scale integrated circuits vlsi design has moved from costly curiosity to an everyday necessity especially with the proliferated applications of embedded computing devices in communications entertainment and household gadgets as a result more and more knowledge on various aspects of vlsi design technologies is becoming a necessity for the engineering technology students of various disciplines with this goal in mind the course material of this book has been designed to cover the various fundamental aspects of vlsi design like categorization and comparison between various technologies used vlsi design basic fabrication processes involved vlsi design design of mos cmos and bi cmos circuits used in vlsi structured design of vlsi introduction to vhdl for vlsi design automated design for placement and routing of vlsi systems vlsi testing and testability the various topics of the book have been discussed lucidly with analysis when required examples figures and adequate analytical and theoretical questions the readers tutors can select all or some of the topics of the book according to the requirements the material of this book has grown out of an undergraduate level class on integrated circuits vlsi design taught by the author for about two decades

Algorithms for VLSI Physical Design Automation

2012-12-06

techniques for the latest deep submicron mega chip projects the start to finish state of the art guide to vlsi design vlsi design is system design to build high performance cost effective ics you must understand all aspects of digital design from planning and layout to fabrication and packaging modern vlsi design second edition systems on silicon is a comprehensive bottom up guide to the entire vlsi design process emphasizing cmos it focuses on the crucial challenges of deep submicron vlsi design coverage includes devices and layouts transistor structures and characteristics wires vias parasitics design rules layout design and tools logic gates and combinational logic networks including interconnect delay and crosstalk sequential machines and sequential system design subsystem design including high speed adders multipliers rom sram sram pgas and plas floorplanning clock distribution and power distribution architecture design including vhdl scheduling function unit selection power and testability chip design methodologies cad systems

and algorithms modern vlsi design second edition systems on silicon offers a complete yet accessible introduction to crosstalk models and optimization it covers minimizing power consumption at every level of abstraction from circuits to architecture and new insights into design for testability techniques that maximize quality despite quicker turnarounds it also presents detailed coverage of the algorithms underlying contemporary vlsi computer aided design software so designers can understand their tools nomatter which ones they choose whether you re a practicing professional or advanced student this is the sophisticated vlsi design knowledge you need to succeed with tomorrow s most challenging projects

VLSI Design

2014

introduction the exponential scaling of feature sizes in semiconductor technologies has side effects on layout optimization related to effects such as inter connect delay noise and crosstalk signal integrity parasitics effects and power dissipation that invalidate the assumptions that form the basis of previous design methodologies and tools this book is intended to sample the most important contemporary and advanced layout opti mization problems emerging with the advent of very deep submicron technologies in semiconductor processing we hope that it will stimulate more people to perform research that leads to advances in the design and development of more efficient effective and elegant algorithms and design tools organization of the book the book is organized as follows a multi stage simulated annealing algorithm that integrates floorplanning and interconnect planning is pre sented in chapter 1 to reduce the run time different interconnect plan ning approaches are applied in different ranges of temperatures chapter 2 introduces a new design methodology the interconnect centric design methodology and its centerpiece interconnect planning which consists of physical hierarchy generation floorplanning with interconnect planning and interconnect architecture planning chapter 3 investigates a net cut minimization based placement tool dragon which integrates the state of the art partitioning and placement techniques

Modern VLSI Design

1998

design automation automated full custom vlsi layout using the ulysses design environment deals with the use of the ulysses design environment for an automated full custom vlsi layout topics covered include vlsi chip design and design process control mechanisms in ulysses and the use of artificial intelligence ai in design environments an example design task is also presented this book is comprised of 10 chapters and begins with an overview of vlsi computer aided design cad focusing on an expert system based design environment aimed at solving the cad tool integration problem an example cad tool suite for such an environment is presented the next chapter describes prior attempts at developing an integrated design environment followed by a discussion on the computer aided vlsi design process that motivated the development of the ulysses design environment the following chapters explore the use of ai techniques within ulysses the fundamental architecture of ulysses and the control mechanisms that govern the decision to execute various cad tools on particular files within ulysses the implementation of ulysses is also discussed the final chapter demonstrates the feasibility of a knowledge based design environment for vlsi chip design applications the success of ulysses at further automating the vlsi design process and the usability of ulysses as a vlsi design environment this monograph will be a valuable resource for systems designers and other practitioners in computer science and computer engineering

Layout Optimization in VLSI Design

2013-06-29

low power and low energy vlsi has become an important issue in today s consumer electronics this book is a collection of pioneering applied research papers in low power vlsi design and technology a comprehensive introductory chapter presents the current status of the industry and academic research in the area of low power vlsi design and technology other topics cover logic synthesis floorplanning circuit design and analysis from the perspective of low power requirements the readers will have a sampling of some key problems in this area as the low power solutions span the entire spectrum of the design process the book also provides excellent references on up to date research and development issues with practical solution techniques

Simulated Annealing for VLSI Design

1988-03-31

this book is structured as a step by step course of study along the lines of a vlsi integrated circuit design project the entire verilog language is presented from the basics to everything necessary for synthesis of an entire 70 000 transistor full duplex serializer deserializer including synthesizable plls the author includes everything an engineer needs for in depth understanding of the verilog language syntax synthesis semantics simulation and test complete solutions for the 27 labs are provided in the downloadable files that accompany the book for readers with access to appropriate electronic design tools all solutions can be developed simulated and synthesized as described in the book a partial list of design topics includes design partitioning hierarchy decomposition safe coding styles back annotation wrapper modules concurrency race conditions assertion based verification clock synchronization and design for test a concluding presentation of special topics includes system verilog and verilog ams

Design Automation

2012-12-02

the current cutting edge vlsi circuit design technologies provide end users with many applications increased processing power and improved cost effectiveness this trend is accelerating with significant implications on future vlsi and systems design vlsi design engineers are always in demand for front end and back end design applications the book aims to give future and current vsli design engineers a robust understanding of the underlying principles of the subject it not only focuses on circuit design processes obeying vlsi rules but also on technological aspects of fabrication the hardware description language hdl verilog is explained along with its modelling style the book also covers cmos design from the digital systems level to the circuit level the book clearly explains fundamental principles and is a guide to good design practices the book is intended as a reference book for senior undergraduate first year post graduate students researchers as well as academicians in vlsi design electronics electrical engineering and materials science the basics and applications of vlsi design from digital system design to ic fabrication and fpga prototyping are each covered in a comprehensive manner at the end of each unit is a section with technical questions including solutions which will serve as an excellent teaching aid to all readers technical topics discussed in the book include digital system design design flow for ic fabrication and fpga based prototyping verilog hdl ic fabrication technology cmos vlsi design miscellaneous it covers

basics of electronics and reconfigurable computing plds latest technology etc

Trace Theory and VLSI Design

1985-10

low power digital vlsi design circuits and systems addresses both process technologies and device modeling power dissipation in cmos circuits several practical circuit examples and low power techniques are discussed low voltage issues for digital cmos and bicmos circuits are emphasized the book also provides an extensive study of advanced cmos subsystem design a low power design methodology is presented with various power minimization techniques at the circuit logic architecture and algorithm levels features low voltage cmos device modeling technology files design rules switching activity concept low power guidelines to engineering practice pass transistor logic families power dissipation of i o circuits multi and low vt cmos logic static power reduction circuit techniques state of the art design of low voltage bicmos and cmos circuits low power techniques in cmos srams and drams low power on chip voltage down converter design numerous advanced cmos subsystems e g adders multipliers data path memories regular structures phase locked loops with several design options trading power delay and area low power design methodology power estimation techniques power reduction techniques at the logic architecture and algorithm levels more than 190 circuits explained at the transistor level

Introduction to VLSI Design

1990

this book teaches basic and advanced concepts new methodologies and recent developments in vlsi technology with a focus on low power design it provides insight on how to use tanner spice cadence tools xilinx tools vhdl programming and synopsis to design simple and complex circuits using latest state of the art technologies emphasis is placed on fundamental transistor circuit level design concepts

Introduction to VLSI Design

1996

master digital design with vlsi and verilog using this up to date and comprehensive resource from leaders in the field digital vlsi design problems and solution with verilog delivers an expertly crafted treatment of the fundamental concepts of digital design and digital design verification with verilog hdl the book includes the foundational knowledge that is crucial for beginners to grasp along with more advanced coverage suitable for research students working in the area of vlsi design including digital design information from the switch level to fpga based implementation using hardware description language hdl the distinguished authors have created a one stop resource for anyone in the field of vlsi design through eleven insightful chapters youll learn the concepts behind digital circuit design including combinational and sequential circuit design fundamentals based on boolean algebra youll also discover comprehensive treatments of topics like logic functionality of complex digital circuits with verilog using software simulators like isim of xilinx the distinguished authors have included additional topics as well like a discussion of programming techniques in verilog including gate level modeling model instantiation dataflow modeling and behavioral modeling a treatment of programmable and reconfigurable devices including logic synthesis introduction of plds and the basics of fpga architecture an introduction to system verilog including

its distinct features and a comparison of verilog with system verilog a project based on verilog hdls with real time examples implemented using verilog code on an fpga board perfect for undergraduate and graduate students in electronics engineering and computer science engineering digital vlsi design problems and solution with verilogalso has a place on the bookshelves of academic researchers and private industry professionals in these fields

Low Power VLSI Design and Technology

2014-06-17

this well organised book provides an in depth coverage of vlsi design engineering which ranges from cmos logic to physical design automation the book begins with a discussion on the structure and operation of mos as mosfet is the basic building block for any vlsi design then it goes on to explain the various fabrication methods of mosfet and cmos implementation and properties of mos inverter circuit and parasitic parameters and resistances associated with mosfet which determine and ultimately limit the performance of a digital system besides it describes design methodology and the concept of the combinational static logic circuits sequential circuit design and cmos dynamic circuits finally the book examines semiconductor memory and the importance of adder and multiplier circuits for the vlsi designer primarily intended as a text for the undergraduate and postgraduate students of electrical and electronics engineering the book would also be of considerable value to designers both beginners and professionals key features provides mathematical derivations for both noise margin and logic voltage explains all combinational and sequential logics separately contains a large number of solved and unsolved problems based on issues related to digital vlsi design

Digital VLSI Design with Verilog

2022-09-01

this book presents an updated selection of the most representative contributions to the 2nd and 3rd ieee workshops on signal propagation on interconnects spi which were held in travemtinde baltic see side germany may 13 15 1998 and in titisee neustadt black forest germany may 19 21 1999 this publication addresses the need of developers and researchers in the field of vlsi chip and package design it offers a survey of current problems regarding the influence of interconnect effects on the electrical performance of electronic circuits and suggests innovative solutions in this sense the present book represents a continua tion and a supplement to the first book signal propagation on interconnects kluwer academic publishers 1998 the papers in this book cover a wide area of research directions beneath the des cription of general trends they deal with the solution of signal integrity problems the modeling of interconnects parameter extraction using calculations and measurements and last but not least actual problems in the field of optical interconnects

Basic VLSI Design Technology

2012-12-06

one of the keys to success in the ic industry is getting a new product to market in a timely fashion and being able to produce that product with sufficient yield to be profitable there are two ways to increase yield by improving the control of the manufacturing process and by designing the process and the circuits in such a way as to minimize the effect of the inherent variations of the process on performance the latter is typically referred to as design for manufacture or statistical design as

device sizes continue to shrink the effects of the inherent fluctuations in the ic fabrication process will have an even more obvious effect on circuit performance and design for manufacture will increase in importance we have been working in the area of statistically based computer aided design for more than 13 years during the last decade we have been working with each other and individually with our students to develop methods and cad tools that can be used to improve yield during the design and manufacturing phases of ic realization this effort has resulted in a large number of publications that have appeared in a variety of journals and conference proceedings thus our motivation in writing this book is to put in one place a description of our approach to ic yield enhancement while the work that is contained in this book has appeared in the open literature we have attempted to use a consistent notation throughout this book

Low-Power Digital VLSI Design

2016-08-08

practicing designers students and educators in the semiconductor field face an ever expanding portfolio of mosfet models in compact mosfet models for vlsi design a b bhattacharyya presents a unified perspective on the topic allowing the practitioner to view and interpret device phenomena concurrently using different modeling strategies readers will learn to link device physics with model parameters helping to close the gap between device understanding and its use for optimal circuit performance bhattacharyya also lays bare the core physical concepts that will drive the future of vlsi development allowing readers to stay ahead of the curve despite the relentless evolution of new models adopts a unified approach to guide students through the confusing array of mosfet models links mos physics to device models to prepare practitioners for real world design activities helps fabless designers bridge the gap with off site foundries features rich coverage of quantum mechanical related phenomena si ge strained silicon substrate non classical structures such as double gate mosfets presents topics that will prepare readers for long term developments in the field includes solutions in every chapter can be tailored for use among students and professionals of many levels comes with matlab code downloads for independent practice and advanced study this book is essential for students specializing in vlsi design and indispensible for design professionals in the microelectronics and vlsi industries written to serve a number of experience levels it can be used either as a course textbook or practitioner s reference access the matlab code solution manual and lecture materials at the companion website wiley com go bhattacharyya

Low Power VLSI Design

2021-12-29

this book facilitates the vlsi interested individuals with not only in depth knowledge but also the broad aspects of it by explaining its applications in different fields including image processing and biomedical the deep understanding of basic concepts gives you the power to develop a new application aspect which is very well taken care of in this book by using simple language in explaining the concepts in the vlsi world the importance of hardware description languages cannot be ignored as the designing of such dense and complex circuits is not possible without them both verilog and vhdl languages are used here for designing the current needs of high performance integrated circuits ics including low power devices and new emerging materials which can play a very important role in achieving new functionalities are the most interesting part of the book the testing of vlsi circuits becomes more crucial than the designing of the circuits in this nanometer

technology era the role of fault simulation algorithms is very well explained and its implementation using verilog is the key aspect of this book this book is well organized into 20 chapters chapter 1 emphasizes on uses of fpga on various image processing and biomedical applications then the descriptions enlighten the basic understanding of digital design from the perspective of hdl in chapters 2 5 the performance enhancement with alternate material or geometry for silicon based fet designs is focused in chapters 6 and 7 chapters 8 and 9 describe the study of bimolecular interactions with biosensing fets chapters 10 13 deal with advanced fet structures available in various shapes materials such as nanowire hfet and their comparison in terms of device performance metrics calculation chapters 14 18 describe different application specific vlsi design techniques and challenges for analog and digital circuit designs chapter 19 explains the vlsi testability issues with the description of simulation and its categorization into logic and fault simulation for test pattern generation using verilog hdl chapter 20 deals with a secured vlsi design with hardware obfuscation by hiding the ic s structure and function which makes it much more difficult to reverse engineer

Digital VLSI Design and Simulation with Verilog

2010-06-30

a new edition of this title is available isbn 10 0137145004 isbn 13 9780137145003 for electrical engineering and computer engineering courses that cover the design and technology of very large scale integrated vlsi circuits and systems may also be used as a vlsi reference for professional vlsi design engineers vlsi design managers and vlsi cad engineers modern vsli design provides a comprehensive bottom up guide to the design of vsli systems from the physical design of circuits through system architecture with focus on the latest solution for system on chip soc design because vsli system designers face a variety of challenges that include high performance interconnect delays low power low cost and fast design turnaround time successful designers must understand the entire design process the third edition also provides a much more thorough discussion of hardware description languages with introduction to both verilog and vhdl for that reason this book presents the entire vsli design process in a single volume

Digital Vlsi Design

2012-12-06

formal aspects of vlsi design towards verifiably correct vlsi design design transformation and chip planning digital design in a functional calculus the algebraic basis of an expert system for vlsi design specification and vlsi design current work on the semantics of digital systems automatic circuit verification using temporal logic two new examples can a simulator verify a circuit formal verification of synchronous systems why higher order logic is a good formalism for specifying and verifying hardware specification and verification using higher order logic a case study

Interconnects in VLSI Design

2012-12-06

quot vlsi physical design automation theory and practice is an essential introduction for senior undergraduates postgraduates and anyone starting work in the field of cad for vlsi it covers all aspects of physical design together with such related areas as automatic cell generation silicon compilation layout editors and

compaction a problem solving approach is adopted and each solution is illustrated with examples each topic is treated in a standard format problem definition cost functions and constraints possible approaches and latest developments book jacket

VLSI Design for Manufacturing: Yield Enhancement

2009-07-23

Compact MOSFET Models for VLSI Design

1983

VLSI Design

2020-08-18

Advanced VLSI Design and Testability Issues

2002

Modern VLSI Design

1986

Formal Aspects of VLSI Design

1999

VLSI Physical Design Automation

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