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

The skills and guidance needed to master RTL hardware design This book teaches readers how to systematically design efficient,portable, and scalable Register Transfer Level (RTL) digitalcircuits using the VHDL hardware description language and synthesissoftware. Focusing on the module-level design, which is composed offunctional units, routing circuit, and storage, the bookillustrates the relationship between the VHDL constructs and theunderlying hardware components, and shows how to develop codes thatfaithfully reflect the module-level design and can be synthesizedinto efficient gate-level implementation. Several unique features distinguish the book: * Coding style that shows a clear relationship between VHDLconstructs and hardware components * Conceptual diagrams that illustrate the realization of VHDLcodes * Emphasis on the code reuse * Practical examples that demonstrate and reinforce designconcepts, procedures, and techniques * Two chapters on realizing sequential algorithms in hardware * Two chapters on scalable and parameterized designs andcoding * One chapter covering the synchronization and interface betweenmultiple clock domains Although the focus of the book is RTL synthesis, it also examinesthe synthesis task from the perspective of the overall developmentprocess. Readers learn good design practices and guidelines toensure that an RTL design can accommodate future simulation,verification, and testing needs, and can be easily incorporatedinto a larger system or reused. Discussion is independent oftechnology and can be applied to both ASIC and FPGA devices. With a balanced presentation of fundamentals and practicalexamples, this is an excellent textbook for upper-levelundergraduate or graduate courses in advanced digital logic.Engineers who need to make effective use of today's synthesissoftware and FPGA devices

should also refer to this book.

If This Isn't Nice, What Is? - Kurt Vonnegut 2014

A collection of graduation speeches by the acclaimed author of such works as A Man Without a Country conveys his recommendations on how to make a difference in the world, his considerable humor and his thoughts about the religious and cultural figures who most inspired his career.

Robotic Computing on FPGAs - Shaoshan Liu 2021-06-30

This book provides a thorough overview of the state-of-the-art field-programmable gate array (FPGA)-based robotic computing accelerator designs and summarizes their adopted optimized techniques. This book consists of ten chapters, delving into the details of how FPGAs have been utilized in robotic perception, localization, planning, and multi-robot collaboration tasks. In addition to individual robotic tasks, this book provides detailed descriptions of how FPGAs have been used in robotic products, including commercial autonomous vehicles and space exploration robots.

IoT Streams for Data-Driven Predictive Maintenance and IoT, Edge, and Mobile for Embedded Machine Learning - Joao Gama 2021-01-09

This book constitutes selected papers from the Second International Workshop on IoT Streams for Data-Driven Predictive Maintenance, IoT Streams 2020, and First International Workshop on IoT, Edge, and Mobile for Embedded Machine Learning, ITEM 2020, co-located with ECML/PKDD 2020 and held in September 2020. Due to the COVID-19 pandemic the workshops were held online. The 21 full papers and 3 short papers presented in this volume were thoroughly reviewed and selected from 35 submissions and are organized according to the workshops and their topics: IoT Streams 2020: Stream Learning; Feature Learning; ITEM 2020: Unsupervised Machine Learning; Hardware; Methods; Quantization.

Improving office efficiency -

Architecture and CAD for Deep-Submicron FPGAS - Vaughn Betz 2012-12-06
Since their introduction in 1984, Field-Programmable Gate Arrays (FPGAs) have become one of the most popular implementation media for digital circuits and have grown into a $2 billion per year industry. As process geometries have shrunk into the deep-submicron region, the logic capacity of FPGAs has greatly increased, making FPGAs a viable implementation alternative for larger and larger designs. To make the best use of these new deep-submicron processes, one must re-design one's FPGAs and Computer- Aided Design (CAD) tools. Architecture and CAD for Deep-Submicron FPGAs addresses several key issues in the design of high-performance FPGA architectures and CAD tools, with particular emphasis on issues that are important for FPGAs implemented in deep-submicron processes. Three factors combine to determine the performance of an FPGA: the quality of the CAD tools used to map circuits into the FPGA, the quality of the FPGA architecture, and the electrical (i.e. transistor-level) design of the FPGA. Architecture and CAD for Deep-Submicron FPGAs examines all three of these issues in concert. In order to investigate the quality of different FPGA architectures, one needs CAD tools capable of automatically implementing circuits in each FPGA architecture of interest. Once a circuit has been implemented in an FPGA architecture, one next needs accurate area and delay models to evaluate the quality (speed achieved, area required) of the circuit implementation in the FPGA architecture under test. This book therefore has three major foci: the development of a high-quality and highly flexible CAD infrastructure, the creation of accurate area and delay models for FPGAs, and the study of several important FPGA architectural issues. Architecture and CAD for

Deep-Submicron FPGAs is an essential reference for researchers, professionals and students interested in FPGAs.

SystemVerilog Golden Reference Guide - 2003

Designing with Programmable Array Logic - Monolithic Memories, Inc 1981

FPGA Architecture - Ian Kuon 2008

Reviews the historical development of programmable logic devices, the fundamental programming technologies that the programmability is built on, and then describes the basic understandings gleaned from research on architectures. It is an invaluable reference for engineers and computer scientists.

International Conference on Creative Business for Smart and Sustainable Growth - 2019

2019 IEEE ACM International Workshop on Heterogeneous High Performance Reconfigurable Computing (H2RC) - IEEE Staff 2019-11-17

this workshop will bring together application experts, software developers, and hardware engineers, both from industry and academia, to share experiences and best practices to leverage the practical application of reconfigurable logic to Scientific Computing, Machine Deep Learning, and Big Data applications

SUSE Linux - Chris Brown, PhD 2006-07-21

SUSE Linux: A Complete Guide to Novell's Community Distribution will get you up to speed quickly and easily on SUSE, one of the most friendly and usable Linux distributions around. From quick and easy installation to excellent hardware detection and support, it's no wonder SUSE is one of the most highly rated distributions on the planet. According to Novell, SUSE is installed more than 7,000 times every day, an average of one installation every 12 seconds. This book will take you deep into the essential operating system components by

presenting them in easy-to-learn modules. From basic installation and configuration through advanced topics such as administration, security, and virtualization, this book captures the important details of how SUSE works--without the fluff that bogs down other books and web sites. Instead, readers get a concise task-based approach to using SUSE as both a desktop and server operating system. In this book, you'll learn how to: Install SUSE and perform basic administrative tasks Share files with other computers Connect to your desktop remotely Set up a web server Set up networking, including Wi-Fi and Bluetooth Tighten security on your SUSE system Monitor for intrusions Manage software and upgrades smoothly Run multiple instances of SUSE on a single machine with Xen Whether you use SUSE Linux from Novell, or the free openSUSE distribution, this book has something for every level of user. The modular, lab-based approach not only shows you how--but also explains why--and gives you the answers you need to get up and running with SUSE Linux. About the author: Chris Brown is a freelance author and trainer in the United Kingdom and Europe. Following Novell's acquisition of SUSE, he taught Linux to Novell's consultants and IT staff and is certified in both Novell's CLP program and Red Hat's RHCE. Chris has a PhD in particle physics from Cambridge.

Project Oberon - Niklaus Wirth 1992

Project Oberon contains a definition of the Oberon Language and describes its relation to Modula-2 and the software tools developed with the system. This definitive, first-hand account of the design, development, and implementation of Oberon completes the Oberon trilogy.

ARM Architecture Reference Manual - David Seal 2001

About the ARM Architecture The ARM architecture is the industry's leading 16/32-bit embedded RISC processor solution. ARM Powered microprocessors are being routinely

designed into a wider range of products than any other 32-bit processor. This wide applicability is made possible by the ARM architecture, resulting in optimal system solutions at the crossroads of high performance, low power consumption and low cost. About the book This is the authoritative reference guide to the ARM RISC architecture. Produced by the architects that are actively working on the ARM specification, the book contains detailed information about all versions of the ARM and Thumb instruction sets, the memory management and cache functions, as well as optimized code examples.
0201737191B05092001

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.

SystemC Golden Reference Guide - Doulos 2002

Multi-Core Embedded Systems - Georgios Kornaros 2018-10-08
Details a real-world product that applies a cutting-edge multi-core architecture Increasingly demanding modern applications—such as those used in

telecommunications networking and real-time processing of audio, video, and multimedia streams—require multiple processors to achieve computational performance at the rate of a few giga-operations per second. This necessity for speed and manageable power consumption makes it likely that the next generation of embedded processing systems will include hundreds of cores, while being increasingly programmable, blending processors and configurable hardware in a power-efficient manner. Multi-Core Embedded Systems presents a variety of perspectives that elucidate the technical challenges associated with such increased integration of homogeneous (processors) and heterogeneous multiple cores. It offers an analysis that industry engineers and professionals will need to understand the physical details of both software and hardware in embedded architectures, as well as their limitations and potential for future growth. Discusses the available programming models spread across different abstraction levels The book begins with an overview of the evolution of multiprocessor architectures for embedded applications and discusses techniques for autonomous power management of system-level parameters. It addresses the use of existing open-source (and free) tools originating from several application domains—such as traffic modeling, graph theory, parallel computing and network simulation. In addition, the authors cover other important topics associated with multi-core embedded systems, such as: Architectures and interconnects Embedded design methodologies Mapping of applications

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.

Architecture of Network Systems - Dimitrios Serpanos 2011-01-12

Architecture of Network Systems explains the practice and methodologies that will allow you to solve a broad range of problems in system design, including problems related to security, quality of service, performance, manageability, and more. Leading researchers Dimitrios Serpanos and Tilman Wolf develop architectures for all network sub-systems, bridging the gap between operation and VLSI. This book provides comprehensive coverage of the technical aspects of network systems, including system-on-chip technologies, embedded protocol processing and high-performance, and low-power design. It develops a functional approach to network system architecture based on the OSI reference model, which is useful for practitioners at every level. It also covers both fundamentals and the latest developments in network systems architecture, including network-on-chip, network processors, algorithms for lookup and classification, and network systems for the next-generation Internet. The book is recommended for practicing engineers designing the architecture of network systems and graduate students in computer engineering and computer science studying network system design. This is the first book to provide comprehensive coverage of the technical aspects of network systems, including processing systems, hardware technologies, memory managers, software routers, and more. Develops a systematic approach to network architectures, based on the OSI reference model, that is useful for practitioners at every level. Covers both the important basics and cutting-edge topics in network systems architecture, including Quality

of Service and Security for mobile, real-time P2P services, Low-Power Requirements for Mobile Systems, and next generation Internet systems.

Euro-Par 2019: Parallel Processing Workshops - Ulrich Schwardmann 2020-05-29

This book constitutes revised selected papers from the workshops held at 25th International Conference on Parallel and Distributed Computing, Euro-Par 2019, which took place in Göttingen, Germany, in August 2019. The 53 full papers and 10 poster papers presented in this volume were carefully reviewed and selected from 77 submissions. Euro-Par is an annual, international conference in Europe, covering all aspects of parallel and distributed processing. These range from theory to practice, from small to the largest parallel and distributed systems and infrastructures, from fundamental computational problems to full-edged applications, from architecture, compiler, language and interface design and implementation to tools, support infrastructures, and application performance aspects. Chapter "In Situ Visualization of Performance-Related Data in Parallel CFD Applications" is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

Leadership Transitions: The Watkins Collection (4 Items) - Michael D. Watkins 2014-08-19

This Harvard Business Review collection features the best in leadership transitions from celebrated author and advisor Michael D. Watkins. Watkins, who has worked for decades guiding senior leaders into new roles to help them and their organizations succeed, is the author of the international bestseller The First 90 Days. With more than 400,000 copies sold worldwide and published in more than 25 languages, the book has become the standard reference for leaders in transition. In addition to the full digital edition (ebook) of The First 90 Days, this collection includes digital editions of Watkins' other popular works: Your Next Move,

which guides professionals through the most common career transitions; Shaping the Game, on how to lead effective negotiations; and his 2012 Harvard Business Review article, “How Managers Become Leaders.” Watkins, whose ideas have guided some of the world’s best leaders through successful transitions, is the chairman of leadership development consultancy Genesis Advisers. Drawing on the perfect combination of research and hands-on experience, he has spent the last two decades working with leaders—both corporate and public—as they transition to new roles, negotiate the future of their organizations, and craft their legacy as leaders. He was previously a professor at the Kennedy School of Government at Harvard, Harvard Business School, INSEAD in France, and IMD in Switzerland.

Reconfigurable Computing - Scott Hauck 2010-07-26

Reconfigurable Computing marks a revolutionary and hot topic that bridges the gap between the separate worlds of hardware and software design— the key feature of reconfigurable computing is its groundbreaking ability to perform computations in hardware to increase performance while retaining the flexibility of a software solution. Reconfigurable computers serve as affordable, fast, and accurate tools for developing designs ranging from single chip architectures to multi-chip and embedded systems. Scott Hauck and Andre DeHon have assembled a group of the key experts in the fields of both hardware and software computing to provide an introduction to the entire range of issues relating to reconfigurable computing. FPGAs (field programmable gate arrays) act as the “computing vehicles to implement this powerful technology. Readers will be guided into adopting a completely new way of handling existing design concerns and be able to make use of the vast opportunities possible with reconfigurable logic in this rapidly evolving field. Designed for

both hardware and software programmers Views of reconfigurable programming beyond standard programming languages Broad set of case studies demonstrating how to use FPGAs in novel and efficient ways

Hardware Accelerator Systems for Artificial Intelligence and Machine Learning - 2021-03-28

Hardware Accelerator Systems for Artificial Intelligence and Machine Learning, Volume 122 delves into artificial Intelligence and the growth it has seen with the advent of Deep Neural Networks (DNNs) and Machine Learning. Updates in this release include chapters on Hardware accelerator systems for artificial intelligence and machine learning, Introduction to Hardware Accelerator Systems for Artificial Intelligence and Machine Learning, Deep Learning with GPUs, Edge Computing Optimization of Deep Learning Models for Specialized Tensor Processing Architectures, Architecture of NPU for DNN, Hardware Architecture for Convolutional Neural Network for Image Processing, FPGA based Neural Network Accelerators, and much more. Updates on new information on the architecture of GPU, NPU and DNN Discusses In-memory computing, Machine intelligence and Quantum computing Includes sections on Hardware Accelerator Systems to improve processing efficiency and performance

Programming Many-Core Chips - András Vajda 2011-06-10

This book presents new concepts, techniques and promising programming models for designing software for chips with "many" (hundreds to thousands) processor cores. Given the scale of parallelism inherent to these chips, software designers face new challenges in terms of operating systems, middleware and applications. This will serve as an invaluable, single-source reference to the state-of-the-art in programming many-core chips. Coverage includes many-core architectures, operating systems, middleware, and programming models.

The Rise of Private Actors in the Space Sector - Alessandra Vernile 2018-03-12
This book provides a broad set of information and data on the rise of private actors in the space sector, organized into different topics covering the various trends that have shaped the space sector during the last decade. The book, written in a descriptive fashion, concludes with recommendations for future analytical research on the topic.
Advanced Parallel Processing Technologies - Pen-Chung Yew 2019-08-13
This book constitutes the proceedings of the 13th International Symposium on Advanced Parallel Processing Technologies, APPT 2019, held in Tianjin, China, in August 2019. The 11 full papers presented in this volume were carefully reviewed and selected from 35 submissions. The papers are organized in topical sections named: System Support for Neural Networks; Scheduling and File Systems; Optimization and Parallelization; Security and Algorithms.
Exploring Zynq Mpsoc - Louise H Crockett 2019-04-11
This book introduces the Zynq MPSoC (Multi-Processor System-on-Chip), an embedded device from Xilinx. The Zynq MPSoC combines a sophisticated processing system that includes ARM Cortex-A53 applications and ARM Cortex-R5 real-time processors, with FPGA programmable logic. As well as guiding the reader through the architecture of the device, design tools and methods are also covered in detail: both the conventional hardware/software co-design approach, and the newer software-defined methodology using Xilinx's SDx development environment. Featured aspects of Zynq MPSoC design include hardware and software development, multiprocessing, safety, security and platform management, and system booting. There are also special features on PYNQ, the Python-based framework for Zynq devices, and machine learning applications. This

book should serve as a useful guide for those working with Zynq MPSoC, and equally as a reference for technical managers wishing to gain familiarity with the device and its associated design methodologies.

Application Specific Integrated Circuit (ASIC) Technology - Norman Einspruch 2012-12-02

Application Specific Integrated Circuit (ASIC) Technology explores and discusses the different aspects of the ASIC technology experienced during the 1990s. The topics of the chapters range from the ASIC business, model, marketing, and development up to its testability, packaging, and quality and reliability. An introductory chapter begins the discussion and tackles the historical perspective and the classification of the ASIC technology. Chapters 2 and 3 cover the business side of the technology as it discusses the market dynamics and marketing strategies. The following chapters focus on the product itself and deal with the design and model and library development. Computer-aided design tools and systems are included in the discussion. Manufacturing and packaging of ASICs are also given attention in the book. Finally, the last three chapters present the application, testability, and reliability of ASIC technology. The text can be of most help to students in the fields of microelectronics, computer technology, and engineering.

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

Digital Design: An Embedded Systems Approach Using Verilog provides a foundation in digital design for students in computer engineering, electrical engineering and computer science courses. It takes an up-to-date and modern approach of presenting digital logic design as an activity in a larger systems design context. Rather than focus on aspects of digital design that have little relevance in a realistic design context, this book concentrates on modern and evolving knowledge and design skills. Hardware

description language (HDL)-based design and verification is emphasized--Verilog examples are used extensively throughout. By treating digital logic as part of embedded systems design, this book provides an understanding of the hardware needed in the analysis and design of systems comprising both hardware and software components. Includes a Web site with links to vendor tools, labs and tutorials. Presents digital logic design as an activity in a larger systems design context Features extensive use of Verilog examples to demonstrate HDL (hardware description language) usage at the abstract behavioural level and register transfer level, as well as for low-level verification and verification environments Includes worked examples throughout to enhance the reader's understanding and retention of the material Companion Web site includes links to tools for FPGA design from Synplicity, Mentor Graphics, and Xilinx, Verilog source code for all the examples in the book, lecture slides, laboratory projects, and solutions to exercises

Embedded Computing for High Performance - João Manuel Paiva Cardoso 2017-06-13

Embedded Computing for High Performance: Design Exploration and Customization Using High-level Compilation and Synthesis Tools provides a set of real-life example implementations that migrate traditional desktop systems to embedded systems. Working with popular hardware, including Xilinx and ARM, the book offers a comprehensive description of techniques for mapping computations expressed in programming languages such as C or MATLAB to high-performance embedded architectures consisting of multiple CPUs, GPUs, and reconfigurable hardware (FPGAs). The authors demonstrate a domain-specific language (LARA) that facilitates retargeting to multiple computing systems using the same source code. In this way, users can decouple original application code from transformed code and enhance productivity and

program portability. After reading this book, engineers will understand the processes, methodologies, and best practices needed for the development of applications for high-performance embedded computing systems. Focuses on maximizing performance while managing energy consumption in embedded systems Explains how to retarget code for heterogeneous systems with GPUs and FPGAs Demonstrates a domain-specific language that facilitates migrating and retargeting existing applications to modern systems Includes downloadable slides, tools, and tutorials

IPC-2591, Version 1.4 - Connected Factory Exchange (CFX) - IPC International 2021-12-31

Applications in Electronics Pervading Industry, Environment and Society - Sergio Saponara 2021-01-25

This book provides a thorough overview of cutting-edge research on electronics applications relevant to industry, the environment, and society at large. It covers a broad spectrum of application domains, from automotive to space and from health to security, while devoting special attention to the use of embedded devices and sensors for imaging, communication and control. The book is based on the 2020 ApplePies Conference, held online in November 2020, which brought together researchers and stakeholders to consider the most significant current trends in the field of applied electronics and to debate visions for the future. Areas addressed by the conference included information communication technology; biotechnology and biomedical imaging; space; secure, clean and efficient energy; the environment; and smart, green and integrated transport. As electronics technology continues to develop apace, constantly meeting previously unthinkable targets, further attention needs to be directed toward the electronics applications and the development of systems that facilitate human activities. This book, written by industrial

and academic professionals, represents a valuable contribution in this endeavor.

5G and Beyond - Xingqin Lin 2021-03-25

This book provides an accessible and comprehensive tutorial on the key enabling technologies for 5G and beyond, covering both the fundamentals and the state-of-the-art 5G standards. The book begins with a historical overview of the evolution of cellular technologies and addresses the questions on why 5G and what is 5G. Following this, six tutorial chapters describe the fundamental technology components for 5G and beyond. These include modern advancements in channel coding, multiple access, massive multiple-input and multiple-output (MIMO), network densification, unmanned aerial vehicle enabled cellular networks, and 6G wireless systems. The second part of this book consists of five chapters that introduce the basics of 5G New Radio (NR) standards developed by 3GPP. These include 5G architecture, protocols, and physical layer aspects. The third part of this book provides an overview of the key 5G NR evolution directions. These directions include ultra-reliable low-latency communication (URLLC) enhancements, operation in unlicensed spectrum, positioning, integrated access and backhaul, air-to-ground communication, and non-terrestrial networks with satellite communication.

Introduction to Reconfigurable Computing - Christophe Bobda 2007-09-30

This work is a comprehensive study of the field. It provides an entry point to the novice willing to move in the research field reconfigurable computing, FPGA and system on programmable chip design. The book can also be used as teaching reference for a graduate course in computer engineering, or as reference to advance electrical and computer engineers. It provides a very strong theoretical and practical background to the field, from the early Estrin's machine to the very modern architecture such as embedded logic devices.

Simplicity is Complex - Hermann Kopetz 2019-07-09

This book investigates the characteristics of simple versus complex systems, and what the properties of a cyber-physical system design are that contribute to an effective implementation and make the system understandable, simple to use, and easy to maintain. The targeted audience is engineers, managers and advanced students who are involved in the design of cyber-physical systems and are willing to spend some time outside the silo of their daily work in order to widen their background and appreciation for the pervasive problems of system complexity. In the past, design of a process-control system (now called cyber-physical systems) was more of an art than an engineering endeavor. The software technology of that time was concerned primarily with functional correctness and did not pay much attention to the temporal dimension of program execution, which is as important as functional correctness when a physical process must be controlled. In the ensuing years, many problems in the design of cyber-physical systems were simplified. But with an increase in the functional requirements and system size, the complexity problems have appeared again in a different disguise. A sound understanding of the complexity problem requires some insight in cognition, human problem solving, psychology, and parts of philosophy. This book presents the essence of the author’s thinking about complexity, accumulated over the past forty years.

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 hardward/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

VLSI Design - Vikram Arkalgud Chandrasetty 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.

Real World Multicore Embedded Systems - Bryon Moyer 2013-02-27

This Expert Guide gives you the techniques and technologies in embedded multicore to optimally design and implement your embedded system. Written by experts with a solutions focus, this encyclopedic reference gives you an indispensable aid to tackling the day-to-day problems when building and managing multicore embedded systems. Following an embedded system design path from start to finish, our team of experts takes you from architecture, through hardware implementation to software programming and debug. With this book you will learn: • What motivates multicore • The architectural options and tradeoffs; when to use what • How to deal with the unique hardware challenges that multicore presents • How to manage the software infrastructure in a multicore environment • How to write effective multicore programs • How to port legacy code into a multicore system and partition legacy software • How to optimize both the system and software • The particular challenges of debugging multicore hardware and software Examples demonstrating timeless implementation details Proven and practical techniques reflecting the authors' expertise built from years of experience and key advice on tackling critical issues

Creating Autonomous Vehicle Systems - Shaoshan Liu 2017-10-25

This book is the first technical overview of autonomous vehicles written for a general computing and engineering audience. The authors share their practical experiences of creating autonomous vehicle systems. These systems are complex, consisting of three major subsystems: (1) algorithms for localization, perception, and planning and control; (2) client systems, such as the robotics operating system and hardware platform; and (3) the cloud platform, which includes data storage,

simulation, high-definition (HD) mapping, and deep learning model training. The algorithm subsystem extracts meaningful information from sensor raw data to understand its environment and make decisions about its actions. The client subsystem integrates these algorithms to meet real-time and reliability requirements. The cloud platform provides offline computing and storage capabilities for autonomous vehicles. Using the cloud platform, we are able to test new algorithms and update the HD map—plus, train better recognition, tracking, and decision models. This book consists of nine chapters. Chapter 1 provides an overview of autonomous vehicle systems; Chapter 2 focuses on localization technologies; Chapter 3 discusses traditional techniques used for perception; Chapter 4 discusses deep learning based techniques for perception; Chapter 5 introduces the planning and control sub-system, especially prediction and routing technologies; Chapter 6 focuses on motion planning and feedback control of the planning and control subsystem; Chapter 7 introduces reinforcement learning-based planning and control; Chapter 8 delves into the details of client systems design; and Chapter 9 provides the details of cloud platforms for autonomous driving. This book should be useful to students, researchers, and practitioners alike. Whether you are an undergraduate or a graduate student interested in autonomous driving, you will find herein a comprehensive overview of the whole autonomous vehicle technology stack. If you are an autonomous driving practitioner, the many practical techniques introduced in this book will be of interest to you. Researchers will also find plenty of references for an effective, deeper exploration of the various technologies.

The Verilog Golden Reference Guide - Doulos 2003