

Digital Design Frank Vahid 2nd Edition

This volume presents the proceedings of Medicon 2016, held in Paphos, Cyprus. Medicon 2016 is the XIV in the series of regional meetings of the International Federation of Medical and Biological Engineering (IFMBE) in the Mediterranean. The goal of Medicon 2016 is to provide updated information on the state of the art on Medical and Biological Engineering and Computing under the main theme "Systems Medicine for the Delivery of Better Healthcare Services". Medical and Biological Engineering and Computing cover complementary disciplines that hold great promise for the advancement of research and development in complex medical and biological systems. Research and development in these areas are impacting the science and technology by advancing fundamental concepts in translational medicine, by helping us understand human physiology and function at multiple levels, by improving tools and techniques for the detection, prevention and treatment of disease. Medicon 2016 provides a common platform for the cross fertilization of ideas, and to help shape knowledge and scientific achievements by bridging complementary disciplines into an interactive and attractive forum under the special theme of the conference that is Systems Medicine for the Delivery of Better Healthcare Services. The programme consists of some 290 invited and submitted papers on new developments around the Conference theme, presented in 3 plenary sessions, 29 parallel scientific sessions and 12 special sessions.

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This book arises from experience the authors have gained from years of work as industry practitioners in the field of Electronic System Level design (ESL). At the heart of all things related to Electronic Design Automation (EDA), the core issue is one of models: what are the models used for, what should the models contain, and how should they be written and distributed. Issues such as interoperability and tool transportability become central factors that may decide which ones are successful and those that cannot get sufficient traction in the industry to survive. Through a set of real examples taken from recent industry experience, this book will distill the state of the art in terms of System-Level Design models and provide practical guidance to readers that can be put into use. This book is an invaluable tool that will aid readers in their own designs, reduce risk in development projects, expand the scope of design projects, and improve developmental processes and project planning.

Recent Advances in Information Science and Technology brings you a balanced, state-of-the-art presentation of the latest concepts, methods, algorithms, techniques, procedures and applications of the fascinating field of Computer Science and Engineering. Written by eminent, leading, international experts, the contributors provide up-to-date aspects of topics discussed and present fresh, original insights into their own experience with Information Science and Technology. This rich "anthology of papers" which compose this volume, contains the latest developments and reflects the experience of many eminent researchers working in different environments (universities, research centers and industry). The book is composed of five parts: • Software Engineering in which new trends and recent scientific results in software engineering, data structures, algorithms, knowledge based systems, VLSI design, computer languages and industrial computer applications are presented. • Signal Processing in which modern topics in signal processing, identification, recognition, speech processing and detection are included. • Multi-Dimensional (m-D) Systems Theory and Applications which contains new research results in m-D systems theory and impressive applications of multidimensional systems mainly in signal processing. • Communication Systems containing modern topics of communication as Digital systems of communication, computer networks theory, ATM networks, optical networks, hybrid fiber coaxial networks, Internet etc. • Modern Numerical Techniques and Related Topics which covers some aspects of the modern computation science and technology.

This title serves as an introduction and reference for the field, with the papers that have shaped the hardware/software co-design since its inception in the early 90s.

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

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?: Analog MOS integrated circuits for signal processing/Roubik Gregorian, Gabor C. Temes. -- Wiley, 1986

This is the first book on embedded systems to offer a unified approach to hardware and software specification and design issues -- and the first to outline a new specify-explore-refine paradigm that is presently being used in industry in an ad-hoc manner, but until now has not been formally described. The book addresses the system design methodology from conceptualization to manufacturing using this new paradigm, and shows how this methodology can result in 10x improvement in productivity. Addresses two of the most significant topics in the design of digital systems -- executable system specification and a methodology for system partitioning and refinement into system-level components. Covers models and architectures; specification languages; a specification example; translation to VHDL; system partitioning; design quality estimation; specification refinement into synthesizable models; and system-design methodology and environment. Contains a complete specification of a model product (telephone answering machine), and demonstrates how to write the specification from an English description. For RISC design methodologists and VHDL methodologists; and CAD software developers.

"Digital Design provides a modern approach to learning the increasingly important topic of digital systems design. The text's focus on register-transfer-level design and present-day applications not only leads to a better appreciation of computers and of today's ubiquitous digital devices, but also provides for a better understanding of careers involving digital design and embedded system design. The book's key features include: An emphasis on register-transfer-level (RTL) design, the level at which most digital design is practiced today, giving readers a modern perspective of the field's applicability. Yet, coverage stays bottom-up and concrete, starting from basic transistors and gates, and moving step-by-step up to more complex components. Extensive use of basic examples to teach and illustrate new concepts, and of

application examples, such as pacemakers, ultrasound machines, automobiles, and cell phones, to demonstrate the immediate relevance of the concepts. Separation of basic design from optimization, allowing development of a solid understanding of basic design, before considering the more advanced topic of optimization. Flexible organization, enabling early or late coverage of optimization methods or of HDLs, and enabling choice of VHDL, Verilog, or SystemC HDLs. Career insights and advice from designers with varying levels of experience. A clear bottom-up description of field-programmable gate arrays (FPGAs). About the Author: Frank Vahid is a Professor of Computer Science & Engineering at the University of California, Riverside. He holds Electrical Engineering and Computer Science degrees; has worked/consulted for Hewlett Packard, AMCC, NEC, Motorola, and medical equipment makers; holds 3 U.S. patents; has received several teaching awards; helped setup UCR's Computer Engineering program; has authored two previous textbooks; and has published over 120 papers on digital design topics (automation, architecture, and low-power).

This volume presents the technical program of the 2007 International Embedded Systems Symposium held in Irvine, California. It covers timely topics, techniques and trends in embedded system design, including design methodology, networks-on-chip, distributed and networked systems, and system verification. It places emphasis on automotive and medical applications and includes case studies and special aspects in embedded system design.

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This book offers readers a set of new approaches and tools a set of tools and techniques for facing challenges in parallelization with design of embedded systems. It provides an advanced parallel simulation infrastructure for efficient and effective system-level model validation and development so as to build better products in less time. Since parallel discrete event simulation (PDES) has the potential to exploit the underlying parallel computational capability in today's multi-core simulation hosts, the author begins by reviewing the parallelization of discrete event simulation, identifying problems and solutions. She then describes out-of-order parallel discrete event simulation (OoO PDES), a novel approach for efficient validation of system-level designs by aggressively exploiting the parallel capabilities of today's multi-core PCs. This approach enables readers to design simulators that can fully exploit the parallel processing capability of the multi-core system to achieve fast speed simulation, without loss of simulation and timing accuracy. Based on this parallel simulation infrastructure, the author further describes automatic approaches that help the designer quickly to narrow down the debugging targets in faulty ESL models with parallelism.

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

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This volume presents the proceedings of the 7th International Workshop on Higher Order Logic Theorem Proving and Its Applications held in Valetta, Malta in September 1994. Besides 3 invited papers, the proceedings contains 27 refereed papers selected from 42 submissions. In total the book presents many new results by leading researchers working on the design and applications of theorem provers for higher order logic. In particular, this book gives a thorough state-of-the-art report on applications of the HOL system, one of the most widely used theorem provers for higher order logic.

A guide to applying software design principles and coding practices to VHDL to improve the readability, maintainability, and quality of VHDL code. This book addresses an often-neglected aspect of the creation of VHDL designs. A VHDL description is also source code, and VHDL designers can use the best practices of software development to write high-quality code and to organize it in a design. This book presents this unique set of skills, teaching VHDL designers of all experience levels how to apply the best design principles and coding practices from the software world to the world of hardware. The concepts introduced here will help readers write code that is easier to understand and more likely to be correct, with improved readability, maintainability, and overall quality. After a brief review of VHDL, the book presents fundamental design principles for writing code, discussing such topics as design, quality, architecture, modularity, abstraction, and hierarchy. Building on these concepts, the book then introduces and provides recommendations for each basic element of VHDL code, including statements, design units, types, data objects, and subprograms. The book covers naming data objects and functions, commenting the source code, and visually presenting the code on the screen. All recommendations are supported by detailed rationales. Finally, the book explores two uses of VHDL: synthesis and testbenches. It examines the key characteristics of code intended for synthesis (distinguishing it from code meant for simulation) and then demonstrates the design and implementation of testbenches with a series of examples that verify different kinds of models, including combinational, sequential, and FSM code. Examples from the book are also available on a companion website, enabling the reader to experiment with the complete source code.

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The purpose of this book is to introduce VHSIC Hardware Description Language (VHDL) and its use for synthesis. VHDL is a hardware description language which provides a means of specifying a digital system over different levels of abstraction. It supports behavior specification during the early stages of a design process and structural specification during the later implementation stages. VHDL was originally introduced as a hardware description language that permitted the simulation of digital designs. It is now increasingly used for design specifications that are given as the input to synthesis tools which translate the specifications into netlists from which the physical systems can be built. One problem with this use of VHDL is that not all of its constructs are useful in synthesis. The specification of delay in signal assignments does not have a clear meaning in synthesis, where delays have already been determined by the implementation technology. VHDL has data-structures such as files and pointers, useful for simulation purposes but not for actual synthesis. As a result synthesis tools accept only subsets of VHDL. This

book tries to cover the synthesis aspect of VHDL, while keeping the simulation-specifics to a minimum. This book is suitable for working professionals as well as for graduate or under graduate study. Readers can view this book as a way to get acquainted with VHDL and how it can be used in modeling of digital designs.

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"A rare look into high-performance main-stream processors exposed with clarity and elegance." — Harold Stone, NEC Research Institute "A unique combination of a very well developed, scholarly, thorough, long-term, perspective with detailed hands-on insight into actual current industrial practices." — Tore Larsen, Princeton University and University of Tromso "There are few books on the market which can compete with this text either in the technical depth of the presentation, or the completeness of the coverage." — Ron Hoelzeman, University of Pittsburgh "The best and easiest way to learn how the latest superscalar microprocessors really work. Not only are the microarchitectural features well presented, but they are presented along with a historical context which shows that the new microprocessors have inherited much from the supercomputers of the 60's and 70's." — Edmund Gallizzi, Eckerd College This work describes in detail the microarchitecture of a high-performance microprocessor, giving an integrated treatment of platform and systems issues relating to the design and implementation of microprocessor-based systems. Unique in content and approach, the accompanying interactive CD-ROM provides multiple books and a wide variety of materials: Complete data books Articles from journals and conference proceedings Manuscripts of important historical interest IEEE and Industry standards VHDL and Verilog simulators Numerous video and audio clips Complete text of the book, including figures and tables Shriver and Smith use AMD's K6 3D microprocessor as a "case study" basis for discussions on microarchitecture issues and increasingly important industry specifications and platforms on systems issues. This book is an important reference for individuals building systems using microprocessors and readers looking for significant insights into fundamental design guidelines that transcend the design, implementation, and use of a specific microprocessor. Practitioners, academics, and technical and product managers alike will benefit from this detailed overview of microprocessors, platforms, and systems for years in the future. The main sections: Microprocessors, Platforms, and Systems A Microarchitecture Case Study The K6 3D Microarchitecture Technology Components of Platform Architecture Platform Memory Technology Platform Optimization Techniques and Directions System Requirements: All of the material on the companion CD-ROM, except for the three simulators, can be used on any system with the following: A CD-ROM reader, a video board, and a sound card Acrobat Reader with Search Version 3.01 or higher All of the standard plug-ins installed including the Search, Movie, and Weblink plug-ins Adobe Acrobat Readers with Search Version 3.01 for Windows systems and some versions of Unix are included on the companion CD-ROM. The Acrobat Reader with Search for Mac systems, as well as for the operating systems with which the Reader or the Reader with Search (strongly recommended) can be used, is available on Adobe's Web-site UNIX users may have to install a .MOV and .WAV viewer for their specific system The simulators can only be installed on Windows 95 or Windows NT systems Web-site: There is a Web-site associated with this book and its companion CD-ROM, <http://computer.org/books/anatomy> (see inside frontflap)

A best-seller in its print version, this comprehensive CD-ROM reference contains unique, fully searchable coverage of all major topics in digital signal processing (DSP), establishing an invaluable, time-saving resource for the engineering community. Its unique and broad scope includes contributions from all DSP specialties, including: telecommunications, computer engineering, acoustics, seismic data analysis, DSP software and hardware, image and video processing, remote sensing, multimedia applications, medical technology, radar and sonar applications

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Embedded systems are today, widely deployed in just about every piece of machinery from toasters to spacecraft. Embedded system designers face many challenges. They are asked to produce increasingly complex systems using the latest technologies, but these technologies are changing faster than ever. They are asked to produce better quality designs with a shorter time-to-market. They are asked to implement increasingly complex functionality but more importantly to satisfy numerous other constraints. To achieve the current goals of design, the designer must be aware with such design constraints and more importantly, the factors that have a direct effect on them. One of the challenges facing embedded system designers is the selection of the optimum processor for the application in hand; single-purpose, general-purpose or application specific. Microcontrollers are one member of the family of the application specific processors. The book concentrates on the use of microcontroller as the embedded system's processor, and how to use it in many embedded system applications. The book covers both the hardware and software aspects needed to design using microcontroller. The book is ideal for undergraduate students and also the engineers that are working in the field of digital system design.

Digital Design with RTL Design, Verilog and VHDL John Wiley & Sons

Top-down approach to practical, tool-independent, digital circuit design, reflecting how circuits are designed.

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Debugging becomes more and more the bottleneck to chip design productivity, especially while developing modern complex integrated circuits and systems at the Electronic System Level (ESL). Today, debugging is still an unsystematic and lengthy process. Here, a simple reporting of a failure is not enough, anymore. Rather, it becomes more and more important not only to find many errors early during development but also to provide efficient methods for their isolation. In Debugging at the Electronic System Level the state-of-the-art of modeling and verification of ESL designs is reviewed. There, a particular focus is taken onto SystemC. Then, a reasoning hierarchy is introduced. The hierarchy combines well-known debugging techniques with whole new techniques to improve the verification efficiency at ESL. The proposed systematic debugging approach is supported amongst others by static code analysis, debug patterns, dynamic program slicing, design visualization, property generation, and automatic failure isolation. All techniques were empirically evaluated using real-world industrial designs. Summarized, the introduced approach enables a systematic search for errors in ESL designs. Here, the debugging techniques improve and accelerate error detection, observation, and isolation as well as design understanding.

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