Floating Point Design With Vivado Hls Xilinx

The year 2019 marked four decades of cluster

computing, a history that began in 1979 when the first cluster systems using Components Off The Shelf (COTS) became operational. This achievement resulted in

a rapidly growing interest in affordable parallel computing for solving compute intensive and large scale problems. It also directly lead to the

founding of the Parco conference series. Starting in 1983, the International Conference on Parallel Computing, ParCo, has long been a leading venue for

discussions of important developments, applications, and future trends in cluster computing, parallel computing, and high-performance computing.

ParCo2019, held in Prague, Czech Republic, from 10 - 13 September 2019, was no exception. Its papers, invited talks, and specialized mini-symposia addressed

cutting-edge topics in computer architectures, programming methods for specialized devices such as field programmable gate arrays (FPGAs) and graphical processing

units (GPUs), innovative applications of parallel computers, approaches to reproducibility in parallel computations, and other relevant areas. This book

presents the proceedings of ParCo2019, with the goal of making the many fascinating topics discussed at the meeting accessible to a broader audience. The

proceedings contains 57 contributions in total, all of which have been peer-reviewed after their presentation. These papers give a wide ranging overview of the

current status of research, developments, and applications in parallel computing. Sensor data fusion is the process of combining error-prone,

heterogeneous, incomplete, and ambiguous data to gather a higher level of situational awareness. In principle, all living creatures are fusing

information from their complementary senses to coordinate their actions and to detect and localize danger. In sensor data fusion, this process is transferred

to electronic systems, which rely on some "awareness" of what is happening in certain areas of interest. By means of probability theory and statistics,

it is possible to model the relationship between the state space and the sensor data. The number of ingredients of the resulting Kalman filter is limited, but its

applications are not. This book constitutes the revised selected papers from the 14th International Conference on Risks and Security of Internet and Systems,

CRiSIS 2019, held in Hammamet, Tunisia, in October 2019. The 20 full papers and 4 short papers presented in this volume were carefully reviewed and selected

from 64 submissions. They cover diverse research themes that range from classic topics, such as risk analysis and management; access control and

permission; secure embedded systems; network and cloud security; information security policy; data protection and machine learning for security;

distributed detection system and blockchain. Explore a comprehensive and state-of-the-art presentation of real-time electromagnetic transient simulation

technology by leaders in the field Real-Time Electromagnetic Transient Simulation of AC-DC Networks delivers a detailed exposition of field programmable gate

array (FPGA) hardware based real-time electromagnetic transient (EMT) emulation for all fundamental equipment used in AC-DC power

grids. The book focuses specifically on detailed device-level models for their hardware realization in a massively parallel and deeply pipelined manner

as well as decomposition techniques for emulating large systems. Each chapter contains fundamental concepts, apparatus models, solution algorithms, and

hardware emulation to assist the reader in understanding the material contained within. Case studies are peppered throughout the book, ranging from small

didactic test circuits to realistically sized large-scale AC-DC grids. The book also provides introductions to FPGA and hardware-in-the-loop (HIL) emulation

procedures, and large-scale networks constructed by the foundational components described in earlier chapters. With a strong focus on high-voltage

direct-current power transmission grid applications, Real-Time Electromagnetic Transient Simulation of AC-DC Networks covers both system-level and

device-level mathematical models. Readers will also enjoy the inclusion of: A thorough introduction to field programmable gate array technology,

including the evolution of FPGAs, technology trends, hardware architectures, and programming tools An exploration of classical power system components,

e.g., linear and nonlinear passive power system components, transmission lines, power transformers, rotating machines, and protective relays A

comprehensive discussion of power semiconductor switches and converters, i.e., AC–DC and DC–DC converters, and specific power electronic apparatus such as DC

circuit breakers An examination of decomposition techniques used at the equipment-level as well as the large-scale system-level for real-time EMT

emulation of AC-DC networks Chapters that are supported by simulation results from well-defined test cases and the corresponding system parameters are

provided in the Appendix Perfect for graduate students and professional engineers studying or working in electrical power engineering, Real-Time

Electromagnetic Transient Simulation of AC-DC Networks will also earn a place in the libraries of simulation specialists, senior modeling and simulation

engineers, planning and design engineers, and system studies engineers.

Applied Reconfigurable Computing. Architectures, Tools,

and Applications

Bring your ideas to life by creating hardware designs and electronic circuits with SystemVerilog

Concepts, Methodologies,

Tools, and Applications
Risks and Security of Internet and Systems
Devices, Circuits and Applications
FPGA-Based Embedded System Developer's Guide

An important working resource for engineers and researchers involved in the design, development, and implementation of signal processing systems The

last decade has seen a rapid expansion of the use of field programmable gate arrays (FPGAs) for a wide range of applications beyond traditional digital

signal processing (DSP) systems. Written by a team of experts working at the leading edge of FPGA research and development, this second edition of FPGA-based

Implementation of Signal Processing Systems has been extensively updated and revised to reflect the latest iterations of FPGA theory, applications, and

technology. Written from a system-level perspective, it features expert discussions of contemporary methods and tools used in the design, optimization and

implementation of DSP systems using programmable FPGA hardware. And it provides a wealth of practical insights—along with illustrative case

studies and timely real-world examples—of critical concern to engineers working in the design and development of DSP systems for radio,

telecommunications, audio-visual, and security applications, as well as bioinformatics, Big Data applications, and more. Inside you will find up-

to-date coverage of: FPGA solutions for Big Data Applications, especially as they apply to huge data sets The use of ARM processors in FPGAs and the transfer

of FPGAs towards heterogeneous computing platforms The evolution of High Level Synthesis tools—including new sections on Xilinx's HLS Vivado tool flow and

Altera's OpenCL approach
Developments in Graphical Processing Units (GPUs), which are rapidly replacing more traditional DSP systems FPGA-based

Implementation of Signal Processing Systems, 2nd Edition is an indispensable guide for engineers and researchers involved in the design and

development of both traditional and cutting-edge data and signal processing systems. Senior-level electrical and computer engineering graduates studying

signal processing or digital signal processing also will find this volume of great interest.
This book constitutes the proceedings of the

14th International Conference on Applied Reconfigurable Computing, ARC 2018, held in Santorini, Greece, in May 2018. The 29 full papers and 22

short presented in this volume were carefully reviewed and selected from 78 submissions. In addition, the volume contains 9 contributions from research projects.

The papers were organized in topical sections named: machine learning and neural networks; FPGA-based design and CGRA optimizations;

applications and surveys; fault-tolerance, security and communication architectures; reconfigurable and adaptive architectures;

design methods and fast prototyping; FPGA-based design and applications; and special session: research projects.
This book focuses on biomedical engineering

and its applications. More specifically, it provides the theoretical background for simulating pathological conditions in the area of bones, muscles,

tissue, cardiovascular, cancer, lung, vertigo disease. The methodological approaches used for simulations include the finite element,

dissipative particle dynamics and lattice boltzman. Aside from the theoretical background and knowledge, the author provides additional material

consisting of a software package for simulations for the theoretical problems. In this way, the book enhances the reader’s learning capabilities in the

field of biomedical engineering.
This book offers readers a clear guide to implementing engineering applications with FPGAs, from the mathematical

description to the hardware synthesis, including discussion of VHDL programming and co-simulation issues. Coverage includes FPGA realizations such as:

chaos generators that are described from their mathematical models; artificial neural networks (ANNs) to predict chaotic time series, for which a

discussion of different ANN topologies is included, with different learning techniques and activation functions; random number generators (RNGs) that are realized

using different chaos generators, and discussions of their maximum Lyapunov exponent values and entropies. Finally, optimized chaotic

oscillators are synchronized and realized to implement a secure communication system that processes black and white and grey-scale images. In each

application, readers will find VHDL programming guidelines and computer arithmetic issues, along with co-simulation examples with Active-HDL and Simulink.

The whole book provides a practical guide to implementing a variety of engineering applications from VHDL programming and co-simulation issues, to

FPGA realizations of chaos generators, ANNs for chaotic time-series prediction, RNGs and chaotic secure communications for image transmission.

14th International Conference, CRiSIS 2019, Hammamet, Tunisia, October 29–31, 2019, Proceedings

Electronic Design

Automation for IC System Design, Verification, and Testing
Embedded Microprocessor System Design using FPGAs
Digital Signal

Processing with Field Programmable Gate Arrays

Automated Technology for Verification and Analysis

This book makes powerful Field Programmable Gate Array (FPGA) and

reconfigurable technology accessible to software engineers by covering different state-of-the-art high-level synthesis approaches (e.g., OpenCL and several C-to-gates compilers). It introduces FPGA technology, its programming model, and how various applications can be implemented on FPGAs without going

through low-level hardware design phases. Readers will get a realistic sense for problems that are suited for FPGAs and how to implement them from a software designer's point of view. The authors demonstrate that FPGAs and their programming model reflect the needs of stream processing problems much better

than traditional CPU or GPU architectures, making them well-suited for a wide variety of systems, from embedded systems performing sensor processing to large setups for Big Data number crunching. This book serves as an invaluable tool for software designers and FPGA design engineers who are interested in high design

productivity through behavioural synthesis, domain-specific compilation, and FPGA overlays. Introduces FPGA technology to software developers by giving an overview of FPGA programming models and design tools, as well as various application examples; Provides a holistic analysis of the topic and enables developers to tackle

the architectural needs for Big Data processing with FPGAs; Explains the reasons for the energy efficiency and performance benefits of FPGA processing; Provides a user-oriented approach and a sense for where and how to apply FPGA technology.

The book covers various aspects of VHDL

programming and FPGA interfacing with examples and sample codes giving an overview of VLSI technology, digital circuits design with VHDL, programming, components, functions and procedures, and arithmetic designs followed by coverage of the core of external I/O programming, algorithmic state machine based system

design, and real-world interfacing examples. • Focus on real-world applications and peripherals interfacing for different applications like data acquisition, control, communication, display, computing, instrumentation, digital signal processing and top module design • Aims to be a quick reference guide to design

digital architecture in the FPGA and develop system with RTC, data transmission protocols

The fields of computer vision and image processing are constantly evolving as new research and applications in these areas emerge. Staying abreast of the most up-to-date developments in this field is necessary

in order to promote further research and apply these developments in real-world settings. Computer Vision: Concepts, Methodologies, Tools, and Applications is an innovative reference source for the latest academic material on development of computers for gaining understanding about videos and digital images.

Highlighting a range of topics, such as computational models, machine learning, and image processing, this multi-volume book is ideally designed for academicians, technology professionals, students, and researchers interested in uncovering the latest innovations in the field.

Get started with FPGA programming using

SystemVerilog, and develop real-world skills by building projects, including a calculator and a keyboard Key FeaturesExplore different FPGA usage methods and the FPGA tool flowLearn how to design, test, and implement hardware circuits using SystemVerilogBuild real-world FPGA

projects such as a calculator and a keyboard using FPGA resourcesBook Description Field Programmable Gate Arrays (FPGAs) have now become a core part of most modern electronic and computer systems. However, to implement your ideas in the real world, you need to get your head around the FPGA

architecture, its toolset, and critical design considerations. FPGA Programming for Beginners will help you bring your ideas to life by guiding you through the entire process of programming FPGAs and designing hardware circuits using SystemVerilog. The book will introduce you to the FPGA and Xilinx architectures

and show you how to work on your first project, which includes toggling an LED. You'll then cover SystemVerilog RTL designs and their implementations. Next, you'll get to grips with using the combinational Boolean logic design and work on several projects, such as creating a calculator and updating it using FPGA

resources. Later, the book will take you through the advanced concepts of AXI and show you how to create a keyboard using PS/2. Finally, you'll be able to consolidate all the projects in the book to create a unified output using a Video Graphics Array (VGA) controller that you'll design. By the end of this SystemVerilog FPGA

book, you'll have learned how to work with FPGA systems and be able to design hardware circuits and boards using SystemVerilog programming. What you will learnUnderstand the FPGA architecture and its implementationGet to grips with writing SystemVerilog RTLMake FPGA projects using

SystemVerilog programmingWork with computer math basics, parallelism, and pipeliningExplore the advanced topics of AXI and keyboard interfacing with PS/2Discover how you can implement a VGA interface in your projectsWho this book is for This FPGA design book is for embedded system developers, engineers,

and programmers who want to learn FPGA and SystemVerilog programming from scratch. FPGA designers looking to gain hands-on experience in working on real-world projects will also find this book useful.

Designing with Xilinx® FPGAs

20th International Conference, SAMOS

2020, Samos, Greece, July 5–9, 2020, Proceedings
Chaotic Systems, Artificial Neural Networks, Random Number Generators, and Secure Communication Systems
Blue Book
eHaCON 2018, Kolkata, India
14th International Symposium, ARC 2018,

Santorini, Greece, May 2-4, 2018, Proceedings

This book constitutes the refereed proceedings of the 17th International Symposium on Automated Technology for Verification and Analysis,

ATVA 2019, held in Taipei, Taiwan in October 2019. The 24 regular papers presented together with 3 tool papers were carefully reviewed and selected from 65 submissions. The symposium is dedicated to

the promotion of research on theoretical and practical aspects of automated analysis, verification and synthesis by providing a forum for interaction between the regional and the international

research communities and industry in the field. The papers focus on cyber-physical systems; runtime techniques; testing; automata; synthesis; stochastic systems and model checking.

This book brings together a selection of the best papers from the eighteenth edition of the Forum on specification and Design Languages Conference (FDL), which took place on September 14-16, 2015, in

Barcelona, Spain. FDL is a well-established international forum devoted to dissemination of research results, practical experiences and new ideas in the application of specification,

design and verification languages to the design, modeling and verification of integrated circuits, complex hardware/software embedded systems, and mixed-technology systems.

This book presents novel compiler techniques, which combine a rigorous mathematical framework, novel program analyses and digital hardware design to advance current high-level

synthesis tools and extend their scope beyond the industrial ‘state of the art’. Implementing computation on customised digital hardware plays an increasingly important role in the quest for

energy-efficient high-performance computing. Field-programmable gate arrays (FPGAs) gain efficiency by encoding the computing task into the chip's physical circuitry and are gaining

rapidly increasing importance in the processor market, especially after recent announcements of large-scale deployments in the data centre. This is driving, more than ever, the demand for

higher design entry abstraction levels, such as the automatic circuit synthesis from high-level languages (high-level synthesis). The techniques in this book apply formal reasoning to high-level

synthesis in the context of demonstrably practical applications. /pp
This book constitutes the refereed proceedings of the 20th International Conference on Embedded Computer

Systems: Architectures, Modeling, and Simulation, SAMOS 2020, held in Samos, Greece, in July 2020.* The 16 regular papers presented were carefully reviewed and selected from 35 submissions.

In addition, 9 papers from two special sessions were included, which were organized on topics of current interest: innovative architectures for security and European projects on

embedded and high performance computing for health applications. * The conference was held virtually due to the COVID-19 pandemic.

Digital System Design with

FPGA: Implementation Using Verilog and VHDL
Fixed-point Hardware Design for CPWC Image Reconstruction
Introduction and Implementations of the

Kalman Filter
High-level Synthesis
MCCS 2020
FPGAs for Software Programmers

This book presents the latest techniques for machine learning based data

analytics on IoT edge devices. A comprehensive literature review on neural network compression and machine learning accelerator is presented from both algorithm level optimization and hardware architecture optimization. Coverage focuses on shallow and deep neural network with

real applications on smart buildings. The authors also discuss hardware architecture design with coverage focusing on both CMOS based computing systems and the new emerging Resistive Random-Access Memory (RRAM) based systems. Detailed case studies such as indoor

positioning, energy management and intrusion detection are also presented for smart buildings.

This book describes the current state of the art in big-data analytics, from a technology and hardware architecture perspective. The presentation is designed to be accessible to a broad

audience, with general knowledge of hardware design and some interest in big-data analytics. Coverage includes emerging technology and devices for data-analytics, circuit design for data-analytics, and architecture and algorithms to support data-analytics. Readers will benefit from the realistic

context used by the authors, which demonstrates what works, what doesn't work, and what are the fundamental problems, solutions, upcoming challenges and opportunities. Provides a single-source reference to hardware architectures for big-data analytics; Covers various levels of big-data

analytics hardware design abstraction and flow, from device, to circuits and systems; Demonstrates how non-volatile memory (NVM) based hardware platforms can be a viable solution to existing challenges in hardware architecture for big-data analytics. XILINX FPGA Design for

Implementation of IEEE Format 32-bit Floating-point Arithmematic [i.e. Arithmetic]Design of an APU-compatible, Double Precision Floating Point Unit for the Xilinx Virtex-4 FPGADesigning with Xilinx® FPGAsUsing VivadoSpringer Coherent plane-wave compounding

(CPWC) ultrasonography is an important imaging modality that allows for very high frame rates. During CPWC image reconstruction, computationally expensive delay-and-sum beamforming can be replaced by faster Fourier-domain remapping. The thesis deals with the MATLAB and

hardware implementation of one of the recently proposed Fourier-domain CPWC reconstruction methods, namely, plane-wave (PW) Stolt's migration algorithm. We first present the floating- and fixed-point implementations of the said migration algorithm in MATLAB, and then

perform quantitative evaluation of the reconstruction results, showing that it is feasible to obtain high-quality compounded images using hardware-oriented scaled fixed-point calculations, as opposed to more expensive software-oriented floating-point arithmetic. We also generate Xilinx FPGA-based

implementations of both floating- and fixed-point MATLAB-based algorithms, using a high-level synthesis (HLS) design flow that collaboratively employs MATLAB Coder and Vivado HLS tool. MATLAB Coder can automatically convert a MATLAB code into a C program, while Vivado HLS can

convert the resulting C program into a synthesizable Verilog/VHDL description. Results show that our fixed-point FPGA implementation is more resource and power efficient and can also operate at a higher clock frequency compared to its floating-point counterpart.

Image and Video Technology – PSIVT 2015 Workshops
Compact and Fast Machine Learning Accelerator for IoT Devices
Design of an APU-compatible, Double Precision Floating Point Unit for the Xilinx Virtex-4 FPGA
17th International Symposium, ARC

2021, Virtual Event, June 29–30, 2021, Proceedings
XILINX FPGA Design for Implementation of IEEE Format 32-bit Floating-point Arithmematic [i.e. Arithmetic]
Sensing Systems and Pervasive Intelligence

This book discusses the implications of new technologies for a secured society. As such, it reflects the main focus of the International Conference

on Ethical Hacking, eHaCon 2018, which is essentially in evaluating the security of computer systems using penetration testing techniques.

Showcasing the most outstanding research papers presented at the conference, the book shares new findings on computer network attacks and defenses, commercial

security solutions, and hands-on, real-world security experience. The respective sections include network security, ethical hacking, cryptography,

digital forensics, cloud security, information security, mobile communications security, and cyber security. This textbook for courses in Embedded

Systems introduces students to necessary concepts, through a hands-on approach. It gives a great introduction to FPGA-based microprocessor

system design using state-of-the-art boards, tools, and microprocessors from Altera/Intel® and Xilinx®. HDL-based designs (soft-core),

parameterized cores (Nios II and MicroBlaze), and ARM Cortex-A9 design are discussed, compared and explored using many hand-on designs projects.

Custom IP for HDMI coder, Floating-point operations, and FFT bit-swap are developed, implemented, tested and speed-up is measured. Downloadable files

include all design examples such as basic processor synthesizable code for Xilinx and Altera tools for PicoBlaze, MicroBlaze, Nios II and ARMv7

architectures in VHDL and Verilog code, as well as the custom IP projects. Each Chapter has a substantial number of short quiz questions, exercises, and

challenging projects. Explains soft, parameterized, and hard core systems design tradeoffs; Demonstrates design of popular KCPSM6 8 Bit microprocessor

step-by-step; Discusses the 32 Bit ARM Cortex-A9 and a basic processor is synthesized; Covers design flows for both FPGA Market leaders Nios II Altera/Intel and

MicroBlaze Xilinx system; Describes Compiler-Compiler Tool development; Includes a substantial number of Homework’s and FPGA exercises and design

projects in each chapter.
This book describes methodologies in the design of VLSI devices, circuits and their applications at

nanoscale levels. The book begins with the discussion on the dominant role of power dissipation in highly scaled devices.The 15 Chapters of the book are

classified under four sections that cover design, modeling, and simulation of electronic, magnetic and compound semiconductors for their applications

in VLSI devices, circuits, and systems. This comprehensive volume eloquently presents the design methodologies for ultra-low power VLSI

design, potential post–CMOS devices, and their applications from the architectural and system perspectives. The book shall serve as an invaluable reference

book for the graduate students, Ph.D./ M.S./ M.Tech. Scholars, researchers, and practicing engineers working in the frontier areas of nanoscale VLSI

design.
Are you an RTL or system designer that is currently using, moving, or planning to move to an HLS design environment? Finally, a

comprehensive guide for designing hardware using C++ is here. Michael Fingeroff's High-Level Synthesis Blue Book presents the most effective C++ synthesis

coding style for achieving high quality RTL. Master a totally new design methodology for coding increasingly complex designs! This book provides a step-by-

step approach to using C++ as a hardware design language, including an introduction to the basics of HLS using concepts familiar to RTL designers. Each chapter

provides easy-to-understand C++ examples, along with hardware and timing diagrams where appropriate. The book progresses from simple concepts such as

sequential logic design to more complicated topics such as memory architecture and hierarchical sub-system design. Later chapters bring together many of

the earlier HLS design concepts through their application in simplified design examples. These examples illustrate the fundamental principles

behind C++ hardware design, which will translate to much larger designs. Although this book focuses primarily on C and C++ to present the basics of C++

synthesis, all of the concepts are equally applicable to SystemC when describing the core algorithmic part of a design. On completion of this book, readers

should be well on their way to becoming experts in high-level synthesis.

WoTUG-37 & WoTUG-38

Nanoscale VLSI

Using Vivado

17th International

Symposium, ATVA 2019, Taipei, Taiwan, October 28–31, 2019, Proceedings Engineering Applications of FPGAs Proceedings of International Ethical

Hacking Conference 2018

The Floating Point Multiplier is a wide variety for increasing accuracy, high speed and high performance in reducing delay, area and power consumption. The floating point is used for

algorithms of Digital Signal Processing and Graphics. Many floating point multipliers are used to reduce the area that perform in both the single precision and the double precision in multiplication,

addition and subtraction. Here, the scientific notations sign bit, mantissa and exponent are used. The real numbers are divided into two components: fixed component of significant range (lack of dynamic range)

and exponential component in floating point (largest dynamic range). The authors convert decimal to floating point and normalize the exponent part and rounding operation to reduce latency. The mantissa of

two values are multiplied and the exponent part is added. The sign results with exclusive-or are obtained. Then, the final result of shift and add floating point multiplier is compared with booth multiplication.

This book features the manuscripts accepted for the Special Issue “Applications in Electronics Pervading Industry, Environment and Society—Sensing Systems and Pervasive Intelligence” of the

MDPI journal Sensors. Most of the papers come from a selection of the best papers of the 2019 edition of the “Applications in Electronics Pervading Industry, Environment and Society”

(APPLEPIES) Conference, which was held in November 2019. All these papers have been significantly enhanced with novel experimental results. The papers give an overview of the trends in research and

development activities concerning the pervasive application of electronics in industry, the environment, and society. The focus of these papers is on cyber physical systems (CPS), with research

proposals for new sensor acquisition and ADC (analog to digital converter) methods, high-speed communication systems, cybersecurity, big data management, and data processing including emerging

machine learning techniques. Physical implementation aspects are discussed as well as the trade-off found between functional performance and hardware/system costs.
This book constitutes the

thoroughly refereed post-conference proceedings of six international workshops held in the framework of the 7th Pacific-Rim Symposium on Image and Video Technology, PSIVT 2015, during November

23-24, 2015, in Auckland, New Zealand. The 29 revised full papers presented were carefully selected from 58 submissions. Their topics diversely ranged from well-established areas to novel

current trends: robot vision, RV 2015; 2D and 3D geometric properties from incomplete data, GPID 2015; vision meets graphics, VG 2015; passive and active electro-optical sensors for aerial and space imaging,

EO4AS 2015; mathematical and computational methods in biomedical imaging and image analysis, MCBMIIA 2015; and video surveillance, VSWS 2015. Most computers today support binary floating-point in

hardware. While suitable for many purposes, it should not be used for financial, commercial and user-centric applications or web services because the decimal data used in these applications cannot be

represented exactly using binary floating-point. The problems of binary floating-point can be avoided by using base 10 (decimal) exponents and preserving those exponents where possible. The design

performs addition and subtraction on 64-bit operands in a single path adder with exception handling fulfilling the released standard and it can easily be extended to also support operations on 128-bit

decimal floating-point numbers. The overall performance of the decimal adder was compared from the point of view of area and speed for the same FPGA families. We synthesized the design for two families of Xilinx,

Spartan II and Vertix II. Complete test and verification is performed on all the design versions fulfilling 3063 test vectors supplied by IBM Corp. and supporting 7 rounding modes (5 stated by the standard

and 2 proposed by IBM) with exception handling for overflow, inexact and invalid operations.

Programmable Gate Array Applications in Electronics Pervading Industry,

Environment and Society
Selected Contributions from FDL 2015
Smart Technology Applications in Business Environments
Emerging Technology and Architecture for Big-data

Analytics

Computer Vision: Concepts, Methodologies, Tools, and Applications

This book provides a platform of scientific interaction between the three challenging and closely linked areas of

ICT-enabled-application research and development: software intensive systems, complex systems and intelligent systems. Software intensive systems strongly interact with other systems, sensors, actuators, devices, other software systems and users. More and more domains are using

software intensive systems, e.g. automotive and telecommunication systems, embedded systems in general, industrial automation systems and business applications. Moreover, web services offer a new platform for enabling software intensive systems. Complex systems research is focused

on the overall understanding of systems rather than their components. Complex systems are characterized by the changing environments in which they interact. They evolve and adapt through internal and external dynamic interactions. The development of intelligent systems and agents, which

are increasingly characterized by their use of ontologies and their logical foundations, offer impulses for both software intensive systems and complex systems. Recent research in the field of intelligent systems, robotics, neuroscience, artificial intelligence, and cognitive sciences

are vital for the future development and innovation of software intensive and complex systems.
Master FPGA digital system design and implementation with Verilog and VHDL This practical guide explores the development and deployment of FPGA-based digital systems using the

two most popular hardware description languages, Verilog and VHDL. Written by a pair of digital circuit design experts, the book offers a solid grounding in FPGA principles, practices, and applications and provides an overview of more complex topics. Important concepts are

demonstrated through real-world examples, ready-to-run code, and inexpensive start-to-finish projects for both the Basys and Arty boards. Digital System Design with FPGA: Implementation Using Verilog and VHDL covers: • Field programmable gate array fundamentals • Basys and

Arty FPGA boards • The Vivado design suite • Verilog and VHDL • Data types and operators • Combinational circuits and circuit blocks • Data storage elements and sequential circuits • Soft-core microcontroller and digital interfacing • Advanced FPGA applications • The

future of FPGA
Technology continues to make great strides in society by providing opportunities for advancement, inclusion, and global competency. As new systems and tools arise, novel applications are created as well. Smart Technology Applications in Business

Environments is an essential reference source for the latest scholarly research on the risks and opportunities of utilizing the latest technologies in different aspects of society such as education, healthcare systems, and corporations. Featuring extensive coverage on a broad range of topics

and perspectives including virtual reality, robotics, and social media, this publication is ideally designed for academicians, researchers, students, and practitioners seeking current research on the improvement and increased productivity from the implementation of smart technologies.

This book presents the proceedings of two conferences, the 37th and 38th in the WoTUG series; Communicating Process Architectures (CPA) 2015, held in Canterbury, England, in August 2015, and CPA 2016, held in Copenhagen, Denmark, in August 2016. Fifteen papers were accepted

for presentation at the 2015 conference. They cover a spectrum of concurrency concerns: mathematical theory, programming languages, design and support tools, verification, multicore infrastructure and applications ranging from supercomputing to embedded. Three

workshops and two evening fringe sessions also formed part of the conference, and the workshop position papers and fringe abstracts are included in this book. Fourteen papers covering the same broad spectrum of topics were presented at the 2016 conference, one of them in the form of

a workshop. They are all included here, together with abstracts of the five fringe sessions from the conference.

Parallel Computing: Technology Trends

Proceedings of the 12th International Conference on Complex, Intelligent, and Software Intensive Systems

(CISIS-2018)
Standard-Compliant Decimal Floating Point
Separation Logic for High-level Synthesis
100 Power Tips for FPGA Designers
FPGA-based Implementation of Signal Processing Systems

Starts with an overview of today's FPGA technology, devices, and tools for designing state-of-the-art DSP systems. A case study in the first chapter is the basis for more than 30 design examples

throughout. The following chapters deal with computer arithmetic concepts, theory and the implementation of FIR and IIR filters, multirate digital signal processing systems, DFT and FFT algorithms, and

advanced algorithms with high future potential. Each chapter contains exercises. The VERILOG source code and a glossary are given in the appendices, while the accompanying CD-ROM

contains the examples in VHDL and Verilog code as well as the newest Altera "Baseline" software. This edition has a new chapter on adaptive filters, new sections on division and floating point

arithmetics, an up-date to the current Altera software, and some new exercises.
This book constitutes the proceedings of the 17th International Symposium on Applied Reconfigurable

Computing, ARC 2021, held as a virtual event, in June 2021. The 14 full papers and 11 short presentations presented in this volume were carefully reviewed and selected from 40 submissions. The papers

cover a broad spectrum of applications of reconfigurable computing, from driving assistance, data and graph processing acceleration, computer security to the societal relevant topic of

supporting early diagnosis of Covid infectious conditions. This edited volume "Field-Programmable Gate Array" is a collection of reviewed and relevant research chapters, offering a comprehensive

overview of recent developments in the field of semiconductors. The book comprises single chapters authored by various researchers and edited by an expert active in the aerospace

engineering systems research area. All chapters are complete within themselves but united under a common research study topic. This publication aims at providing a thorough overview of the

latest research efforts by international authors and open new possible research paths for further novel developments.
This book presents high-quality papers from the Fifth

International Conference on Microelectronics, Computing & Communication Systems (MCCS 2020). It discusses the latest technological trends and advances in MEMS and nanoelectronics, wireless

communication, optical communication, instrumentation, signal processing, image processing, bioengineering, green energy, hybrid vehicles, environmental science, weather forecasting,

cloud computing, renewable energy, RFID, CMOS sensors, actuators, transducers, telemetry systems, embedded systems and sensor network applications. It includes papers based on original

theoretical, practical and experimental simulations, development, applications, measurements and testing. The applications and solutions discussed here provide excellent reference material

for future product development.

FPGA Programming for Beginners

Computational Modeling and Simulation Examples in Bioengineering

Languages, Design Methods, and Tools for Electronic System Design
Communicating Process Architectures 2015 & 2016
Complex, Intelligent, and Software Intensive Systems

RV 2015, GPID 2013, VG 2015, EO4AS 2015, MCBMIIA 2015, and VSWS 2015, Auckland, New Zealand, November 23-27, 2015. Revised Selected Papers

This book helps readers to implement their

designs on Xilinx® FPGAs. The authors demonstrate how to get the greatest impact from using the Vivado® Design Suite, which delivers a SoC-strength, IP-centric

and system-centric, next generation development environment that has been built from the ground up to address the productivity bottlenecks in system-level

integration and implementation. This book is a hands-on guide for both users who are new to FPGA designs, as well as those currently using the legacy Xilinx

tool set (ISE) but are now moving to Vivado. Throughout the presentation, the authors focus on key concepts, major mechanisms for design

entry, and methods to realize the most efficient implementation of the target design, with the least number of iterations.

The first of two volumes

in the Electronic Design Automation for Integrated Circuits Handbook, Second Edition, Electronic Design Automation for IC System Design,

Verification, and Testing thoroughly examines system-level design, microarchitectural design, logic verification, and

testing. Chapters contributed by leading experts authoritatively discuss processor modeling and design tools, using performance metrics to select

microprocessor cores for integrated circuit (IC) designs, design and verification languages, digital simulation, hardware acceleration and emulation, and much

more. New to This Edition: Major updates appearing in the initial phases of the design flow, where the level of abstraction keeps rising to support more

functionality with lower non-recurring engineering (NRE) costs Significant revisions reflected in the final phases of the design flow, where the

complexity due to smaller and smaller geometries is compounded by the slow progress of shorter wavelength lithography New coverage of cutting-edge

applications and approaches realized in the decade since publication of the previous edition—these are illustrated by new chapters on high-level

synthesis, system-on-chip (SoC) block-based design, and back-annotating system-level models Offering improved depth and modernity, Electronic Design

Automation for IC System Design, Verification, and Testing provides a valuable, state-of-the-art reference for electronic design automation (EDA)

students, researchers, and professionals. Embedded Computer Systems: Architectures, Modeling, and Simulation Real-Time Electromagnetic

Transient Simulation of AC-DC Networks
Proceeding of Fifth International Conference on Microelectronics, Computing and Communication Systems

Single Precision
Floating Point
Multiplier
Field