Axi Interface Tutorial

Why learn and use Verilog if you're a student, beginning designer, or leading edge systems designer? The naive would ignore Verilog and "standardize" by using VHDL, the result of a decade-long committee design process. A single language for the whole world would appear to: ease the training of designers and others who use descriptions, increase tool competition to lower costs, and increase design sharing and library usage. Further, the U. S. Department of Defense (DOD) mandated its use for design description Mandated standards rarely are best, and often not very good. Competition is good because it encourages rapid evolution. Also, we know that evolved, de facto standards embodied in a time-tested product based on initial conceptual clarity from one person or organization versus de jure standards coming from large committees or government mandates are often preferred. A standard must be "open" so that many others can use it, build on it, and compete to make it better. One only has to compare: C, C++, and FORTRAN versus ADA (DOD's mandated language), PLl; TCP/IP versus OSI; the Intel X86 or PowerPC microprocessors versus DOD's many architectures; Windows versus the many UNIX dialects; and various industry buses versus DOD's Futurebus. Verilog, introduced in 1985, was developed by one person, Phil Moorby at Gate way Design Automation. It was Phil's third commercial logic simulator.

This book is about the Zynq-7000 All Programmable System on Chip, the family of devices from Xilinx that combines an application-grade ARM Cortex-A9 processor with traditional FPGA logic fabric. Catering for both new and experienced readers, it covers fundamental issues in an accessible way, starting with a clear overview of the device architecture, and an introduction to the design tools and processes for developing a Zynq SoC. Later chapters progress to more advanced topics such as embedded systems development, IP block design and operating systems. Maintaining a 'real-world' perspective, the book also compares Zynq with other device alternatives, and considers end-user applications. The Zynq Book is accompanied by a set of practical tutorials hosted on a companion website. These tutorials will guide the reader through first steps with Zynq, following on to a complete, audio-based embedded systems design.

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.

This book provides an in-depth overview of on chip instrumentation technologies and various approaches taken in adding instrumentation to System on Chip (ASIC, ASSP, FPGA, etc.) design that are collectively becoming known as Design for Debug (DfD). On chip instruments are hardware based blocks that are added to a design for the specific purpose and improving the visibility of internal or embedded portions of the design (specific instruction flow in a processor, bus transaction in an on chip bus as examples) to improve the analysis or optimization capabilities for a SoC. DfD is the methodology and infrastructure that surrounds the instrumentation. Coverage includes specific design examples and discussion of implementations and DfD tradeoffs in a decision to design or select instrumentation or SoC that include instrumentation. Although the focus will be on hardware implementations, software and tools will be discussed in some detail.

How To Code in Node.js

Building Beautiful UI With Jetpack Compose

Exploring Zynq Mpsoc

Python Data Science Handbook

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

The FEniCS Tutorial I

A Guide to Learning the Testbench Language Features

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.

Field Programmable Gate Arrays (FPGAs) are currently recognized as the most suitable platform for the implementation of complex digital systems targeting an increasing number of industrial electronics applications. They cover a huge variety of application areas, such as: aerospace, food industry, art, industrial automation, automotive, biomedicine, process control, military, logistics, power electronics, chemistry, sensor networks, robotics, ultrasound, security, and artificial vision. This book first presents the basic architectures of the devices to familiarize the reader with the fundamentals of FPGAs before identifying and discussing new resources that extend the ability of the devices to solve problems in new application domains. Design methodologies are discussed and application examples are included for some of these domains, e.g., mechatronics, robotics, and power systems.

This book comprises a set of five tutorials, and provides a practical introduction to working with Zynq-7000 All Programmable System on Chip, the family of devices from Xilinx that combines an application-grade ARM Cortex-A9 processor with traditional FPGA logic fabric. It is a companion text for 'The Zynq Book' (ISBN-13: 978-0992978709). The tutorials target two popular Zynq development boards: the ZedBoard, and the lower cost Zybo. Working through, the reader will take first steps with the Vivado integrated development environment and Software Developers Kit (SDK), and be introduced to the methodology of developing embedded systems based on Zynq. Different methods of creating Intellectual Property (IP) cores are demonstrated, including the use of Vivado High Level Synthesis (HLS), and these IPs are later combined to form a complete audio-based embedded system. These tutorials are set at the introductory level, and are suitable for undergraduate / postgraduate teaching, as well as self-learning by researchers, professional engineers, and hobbyists. Example and support files can be downloaded from the book's companion website.

Provides detailed information about importing map data and preparing the spatial databases required to create geographic information systems using SAS/GIS software. Also contains the complete reference for the GIS procedure in SAS/GIS software.

13th International Symposium, ARC 2017, Delft, The Netherlands, April 3-7, 2017, Proceedings

A Practical Guide to TPM 2.0

System on Chip Interconnect

Using Vivado

Designing with Xilinx® FPGAs

Spatial Data and Procedure Guide

NIM from A to Z in AIX 5L

Hardware/software co-verification is how to make sure that embedded system software works correctly with the hardware, and that the hardware has been properly designed to run the software successfully -before large sums are spent on prototypes or manufacturing. This is the first book to apply this verification technique to the rapidly growing field of embedded systems-on-a-chip(SoC). As traditional embedded system design evolves into single-chip design, embedded engineers must be armed with the necessary information to make educated decisions about which tools and methodology to deploy. SoC verification requires a mix of expertise from the disciplines of microprocessor and computer architecture, logic design and simulation, and C and Assembly language embedded software. Until now, the relevant information on how it all fits together has not been available. Andrews, a recognized expert, provides in-depth information about how co-verification really works, how to be successful using it, and pitfalls to avoid. He illustrates these concepts using concrete examples with the ARM core - a technology that has the dominant market share in embedded system product design. The companion CD-ROM contains all source code used in the design examples, a searchable e-book version, and useful design tools. * The only book on verification for systems-on-a-chip (SoC) on the market * Will save engineers and their companies time and money by showing them how to speed up the testing process, while still avoiding costly mistakes * Design examples use the ARM core, the dominant technology in SoC, and all the source code is included on the accompanying CD-Rom, so engineers can easily use it in their own designs

This book presents computer programming as a key method for solving mathematical problems. There are two versions of the book, one for MATLAB and one for Python. The book was inspired by the Springer book TCSE 6: A Primer on Scientific Programming with Python (by Langtangen), but the style is more accessible and concise, in keeping with the needs of engineering students. The book outlines the shortest possible path from no previous experience with programming to a set of skills that allows the students to write simple programs for solving common mathematical problems with numerical methods in engineering and science courses. The emphasis is on generic algorithms, clean design of programs, use of functions, and automatic tests for verification.

A hands-on introduction to FPGA prototyping and SoC design This is the successor edition of the popular FPGA Prototyping by Verilog Examples text. It follows the same "learning-by-doing" approach to teach the fundamentals and practices of HDL synthesis and FPGA prototyping. The new edition uses a coherent series of examples to demonstrate the process to develop sophisticated digital circuits and IP (intellectual property) cores, integrate them into an SoC (system on a chip) framework, realize the system on an FPGA prototyping board, and verify the hardware and software operation. The examples start with simple gate-level circuits, progress gradually through the RT (register transfer) level modules, and lead to a functional embedded system with custom I/O peripherals and hardware accelerators. Although it is an introductory text, the examples are developed in a rigorous manner, and the derivations follow the strict design guidelines and coding practices used for large, complex digital systems. The book is completely updated and uses the SystemVerilog language, which "absorbs" the Verilog language. It presents the hardware design in the SoC context and introduces the hardware-software co-design concept. Instead of treating examples as isolated entities, the book integrates them into a single coherent SoC platform that allows readers to explore both hardware and software "programmability" and develop complex and interesting embedded system projects. The new edition: Adds four general-purpose IP cores, which are multi-channel PWM (pulse width modulation) controller, I2C controller, SPI controller, and XADC (Xilinx analog-to-digital converter) controller. Introduces a music synthesizer constructed with a DDFS (direct digital frequency synthesis) module and an ADSR (attack-decay-sustain-release) envelope generator. Expands the original video controller into a complete stream based video subsystem that incorporates a video synchronization circuit, a test-pattern generator, an OSD (on-screen display) controller, a sprite generator, and a frame buffer. Provides a detailed discussion on blocking and nonblocking statements and coding styles. Describes basic concepts of software-hardware co-design with Xilinx MicroBlaze MCS soft-core processor. Provides an overview of bus interconnect and interface circuit. Presents basic embedded system software development. Suggests additional modules and peripherals for interesting and challenging projects. FPGA Prototyping by SystemVerilog Examples makes a natural companion text for introductory and advanced digital design courses and embedded system courses. It also serves as an ideal self-teaching guide for practicing engineers who wish to learn more about this emerging area of interest.

Multiphysics Modeling Using COMSOL® rapidly introduces the senior level undergraduate, graduate or professional scientist or engineer to the art and science of computerized modeling for physical systems and devices. It offers a step-by-step modeling methodology through examples that are linked to the Fundamental Laws of Physics through a First Principles Analysis approach. The text explores a breadth of multiphysics models in coordinate systems that range from 1D to 3D and introduces the readers to the numerical analysis modeling techniques employed in the COMSOL® Multiphysics® software. After readers have built and run the examples, they will have a much firmer understanding of the concepts, skills, and benefits acquired from the use of computerized modeling techniques to solve their current technological problems and to explore new areas of application for their particular technological areas of interest.

Design and Debug for Systems on Chip

Tools and Techniques for Building with Embedded Linux

Essential Tools for Working with Data

Image Processing Using FPGAs

Digital Design with Chisel

Billboard

FPGA Programming for Beginners

This book offers a concise and gentle introduction to finite element programming in Python based on the popular FEniCS software library. Using a series of examples, including the Poisson equation, the equations of linear elasticity, the incompressible Navier-Stokes equations, and systems of nonlinear advection-diffusion-reaction equations, it guides readers through the essential steps to quickly solving a PDE in FEniCS, such as how to define a finite variational problem, how to set boundary conditions, how to solve linear and nonlinear systems, and how to visualize solutions and structure finite element Python programs. This book is open access under a CC BY license.

This book presents a selection of papers representing current research on using field programmable gate arrays (FPGAs) for realising image processing algorithms. These papers are reprints of papers selected for a Special Issue of the Journal of Imaging on image processing using FPGAs. A diverse range of topics is covered, including parallel soft processors, memory management, image filters, segmentation, clustering, image analysis, and image compression. Applications include traffic sign recognition for autonomous driving, cell detection for histopathology, and video compression. Collectively, they represent the current state-of-the-art on image processing using FPGAs.

••PCI EXPRESS is considered to be the most general purpose bus so it should appeal to a wide audience in this arena.•Today's buses are becoming more specialized to meet the needs of the particular system applications, building the need for this book.•Mindshare and their only competitor in this space, Solari, team up in this new book.

"The second edition of The Designer's Guide to VHDL sets a new standard in VHDL texts. I am certain that you will find it a very valuable addition to your library." --From the foreword by Paul Menchini, Menchini & AssociatesSince the publication of the first edition of The Designer's Guide to VHDL in 1996, digital electronic systems have increased exponentially in their complexity, product lifetimes have dramatically shrunk, and reliability requirements have shot through the roof. As a result more and more designers have turned to VHDL to help them dramatically improve productivity as well as the quality of their designs.VHDL, the IEEE standard hardware description language for describing digital electronic systems, allows engineers to describe the structure and specify the function of a digital system as well as simulate and test it before manufacturing. In addition, designers use VHDL to synthesize a more detailed structure of the design, freeing them to concentrate on more strategic design decisions and reduce time to market. Adopted by designers around the world, the VHDL family of standards have recently been revised to address a range of issues, including portability across synthesis tools.This best-selling comprehensive tutorial for the language and authoritative reference on its use in hardware design at all levels--from system to gates--has been revised to reflect the new IEEE standard, VHDL-2001. Peter Ashenden, a member of the IEEE VHDL standards committee, presents the entire description language and builds a modeling methodology based on successful software engineering techniques. Reviewers on Amazon.com have consistently rated the first edition with five stars. This second edition updates the first, retaining the authors unique ability to teach this complex subject to a broad audience of students and practicing professionals.Features: Details how the new standard allows for increased portability across tools. Covers related standards, including the Numeric Synthesis Package and the Synthesis Operability Package, demonstrating how they can be used for digital systems design. Presents four extensive case studies to demonstrate and combine features of the language taught across multiple chapters. Requires only a minimal background in programming, making it an excellent tutorial for anyone in computer architecture, digital systems engineering, or CAD.

Fundamentals, Advanced Features, and Applications in Industrial Electronics

A First Principles Approach

On-Chip Instrumentation

PCI Express System Architecture

Automated Solution of Differential Equations by the Finite Element Method

Xilinx MicroBlaze MCS SoC

The Verilog® Hardware Description Language

mental improvements during the same period. What is clearly needed in verification techniques and technology is the equivalent of a synthesis productivity breakthrough. In the second edition of Writing Testbenches, Bergeron raises the verification level of abstraction by introducing coverage-driven constrained-random transaction-level self-checking testbenches all made possible through the introduction of hardware verification languages (HVLs), such as e from Verisity and OpenVera from Synopsys. The state-of-art methodologies described in Writing Test benches will contribute greatly to the much-needed equivalent of a synthesis breakthrough in verification productivity. I not only highly recommend this book, but also I think it should be required reading by anyone involved in design and verification of today's ASIC, SoCs and systems. Harry Foster Chief Architect Verplex Systems, Inc. xviii Writing Testbenches: Functional Verification of HDL Models PREFACE If you survey hardware design groups, you will learn that between 60% and 80% of their effort is now dedicated to verification. 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.

Based on the popular Artech House classic, Digital Communication Systems Engineering with Software-Defined Radio, this book provides a practical approach to quickly learning the software-defined radio (SDR) concepts needed for work in the field. This up-to-date volume guides readers on how to quickly prototype wireless designs using SDR for real-world testing and experimentation. This book explores advanced wireless communication techniques such as OFDM, LTE, WLA, and hardware targeting. Readers will gain an understanding of the core concepts behind wireless hardware, such as the radio frequency front-end, analog-to-digital and digital-to-analog converters, as well as various processing technologies. Moreover, this volume includes chapters on timing estimation, matched filtering, frame synchronization message decoding, and source coding. The orthogonal frequency division multiplexing is explained and details about HDL code generation and deployment are provided. The book concludes with coverage of the WLAN toolbox with OFDM beacon reception and the LTE toolbox with downlink reception. Multiple case studies are provided throughout the book. Both MATLAB and Simulink source code are included to assist readers with their projects in the field.

Advanced Formal Verification shows the latest developments in the verification domain from the perspectives of the user and the developer. World leading experts describe the underlying methods of today's verification tools and describe various scenarios from industrial practice. In the first part of the book the core techniques of today's formal verification tools, such as SAT and BDDs are addressed. In addition, multipliers, which are known to be difficult, are studied. The second part gives insight in professional tools and the underlying methodology, such as property checking and assertion based verification. Finally, analog components have to be considered to cope with complete system on chip designs.

A Gentle Introduction to Numerical Simulations with MATLAB/Octave

Xilinx MicroBlaze MCS SoC Edition

FPGAs

The FEniCS Book

Small-Scale Aquaponic Food Production

Advanced Formal Verification

SystemVerilog for Verification

Build Beautiful Apps With Jetpack ComposeJetpack Compose is hyping up everyone in the Android UI toolkit world. This completely new and modern solution to building declarative user interfaces provides more opportunity than ever to create beautiful, reactive and animated apps.However, because of its early-in-development status, Jetpack Compose is missing one of the most important pieces of successful software: detailed documentation. That's why we've prepared a whole book's worth of documentation for you!Jetpack Compose By Tutorials is here to help, by showing you exactly how Compose works, what its fundamental components are and how you can use them to build complex real-world apps! Who this book is forThis book is for all Android developers who have experience with the legacy UI Toolkit through XML and View components, but who are looking for a fresh, reusable, clean and easy-to-use solution to reduce their boilerplate code while building stunning user interfaces.Topics covered in Jetpack Compose by TutorialsFundamentals: Core Jetpack Compose elements and functionsCombining components: Mixing different layouts and building beautiful interfacesState Management: State wrappers, LiveData observables and UI recompositionUI Styling: Modifiers for size, shape, colors, background, padding and alignmentUser Interaction: Different click, touch and scroll listeners and their handlersAnimations: State changes, value animations and complex transitionsOne thing you can count on: After reading this book, you'll be prepared to tackle any design specification and build it in your Android apps using Jetpack Compose. You'll make your apps really stand out by adding different modifiers and Material Design components, as well as animations.

In its 114th year, Billboard remains the world's premier weekly music publication and a diverse digital, events, brand, content and data licensing platform. Billboard publishes the most trusted charts and offers unrivaled reporting about the latest music, video, gaming, media, digital and mobile entertainment issues and trends.

Based on the highly successful second edition, this extended edition of SystemVerilog for Verification: A Guide to Learning the Testbench Language Features teaches all verification features of the SystemVerilog language, providing hundreds of examples to clearly explain the concepts and basic fundamentals. It contains materials for both the full-time verification engineer and the student learning this valuable skill. In the third edition, authors Chris Spear and Greg Tumbush start with how to verify a design, and then use that context to demonstrate the language features, including the advantages and disadvantages of different styles, allowing readers to choose between alternatives. This textbook contains end-of-chapter exercises designed to enhance students' understanding of the material. Other features of this revision include: New sections on static variables, print specifiers, and DPI from the 2009 IEEE language standard Descriptions of UVM features such as factories, the test registry, and the configuration database Expanded code samples and explanations Numerous samples that have been tested on the major SystemVerilog simulators SystemVerilog for Verification: A Guide to Learning the Testbench Language Features, Third Edition is suitable for use in a one-semester SystemVerilog course on SystemVerilog at the undergraduate or graduate level. Many of the improvements to this new edition were compiled through feedback provided from hundreds of readers.

Updated for Xcode 7.3 and Swift 2.3 Make Delightful Animations with Swift! There's no denying it: creating animations is one of the most enjoyable parts of iOS development. Animations are fun to create, they breathe life into your user interface, and they make your app a delight to use. In this book, you'll learn about iOS animation in Swift from beginning to advanced through a series of hands-on tutorials and challenges, that make your app look and feel great. Up to date with iOS 9, Xcode 7.3, and Swift 2.3. Who This Book Is For: This book is for intermediate to advanced developers, who already know the basics of iOS and Swift development and want to dive deep into animations. Topics Covered in iOS Animations by Tutorials: View Animations: Start with the basics by learning how to animate views: size, position, color, and more. Springs: Make your animations bounce with realistic spring behavior. Transitions: Add subtle transitoins when you add or remove subviews. Keyframe Animations: Learn how to make complex animations with precise multi-stage timing. Animation and Auto Layout: Learn how to animate with Auto Layout by animating constraints. Layer Animations: Dive deeper and use layer animation for more advanced techniques. Shapes and Masks: Learn how to use shapes and layer masks for cool effects. Gradient Animations: Make moving gradients like the "slide to unlock" screen. Stroke and Path Animations: Animate lines moving over time along a path. 3D Animations: Rotate, translate, and scale your layers over time in three dimensions. And much more, including: Particle emitters, frame animations, and third-party animation libraries! The iOS Tutorial Team takes pride in making sure each tutorial we write holds to the highest standards of quality. We want our tutorials to be well written, easy to follow, and fun. And we don't want to just skim the surface of a subject - we want to really dig into it, so you can truly understand how it works and apply the knowledge directly in your own apps.

FPGA Prototyping by SystemVerilog Examples

Embedded Processing with the Arm Cortex-A9 on the Xilinx Zynq-7000 All Programmable Soc

Updated for Swift 2. 2: IOS 9 and Swift 2. 2 Edition

Introduction to Embedded Systems, Second Edition

Using the Trusted Platform Module in the New Age of Security

Multiphysics Modeling Using COMSOL?

On-Chip Communication Architectures

This book is a tutorial written by researchers and developers behind the FEniCS Project and explores an advanced, expressive approach to the development of mathematical software. The presentation spans mathematical background, software design and the use of FEniCS in applications. Theoretical aspects are complemented with computer code which is available as free/open source software. The book begins with a special introductory tutorial for beginners. Following are chapters in Part I addressing fundamental aspects of the approach to automating the creation of finite element solvers. Chapters in Part II address the design and implementation of the FEniCS software. Chapters in Part III present the application of FEniCS to a wide range of applications, including fluid flow, solid mechanics, electromagnetics and geophysics.

Over the past decade, system-on-chip (SoC) designs have evolved to address the ever increasing complexity of applications, fueled by the era of digital convergence. Improvements in process technology have effectively shrunk board-level components so they can be integrated on a single chip. New on-chip communication architectures have been designed to support all inter-component communication in a SoC design. These communication architecture fabrics have a critical impact on the power consumption, performance, cost and design cycle time of modern SoC designs. As application complexity strains the communication backbone of SoC designs, academic and industrial R&D efforts and dollars are increasingly focused on communication architecture design. On-Chip Communication Architecures is a comprehensive reference on concepts, research and trends in on-chip communication architecture design. It will provide readers with a comprehensive survey, not available elsewhere, of all current standards for on-chip communication architectures. A definitive guide to on-chip communication architectures, explaining key concepts, surveying research efforts and predicting future trends Detailed analysis of all popular standards for on-chip communication architectures Comprehensive survey of all research on communication architectures, covering a wide range of topics relevant to this area, spanning the past several years, and up to date with the most current research efforts Future trends that with have a significant impact on research and design of communication architectures over the next several years

Aquaponics is the integration of aquaculture and soilless culture in a closed production system. This manual details aquaponics for small-scale production--predominantly for home use. It is divided into nine chapters and seven annexes, with each chapter dedicated to an individual module of aquaponics. The target audience for this manual is agriculture extension agents, regional fisheries officers, non-governmental organizations, community organizers, government ministers, companies and singles worldwide. The intention is to bring a general understanding of aquaponics to people who previously may have only known about one aspect.

In-depth instruction and practical techniques for buildingwith the BeagleBone embedded Linux platform Exploring BeagleBone is a hands-on guide to bringinggadgets, gizmos, and robots to life using the popular BeagleBoneembedded Linux platform. Comprehensive content and deep detailprovide more than just a BeagleBone instructionmanual—you'll also learn the underlying engineeringtechniques that will allow you to create your own projects. Thebook begins with a foundational primer on essential skills, andthen gradually moves into communication, control, and advancedapplications using C/C++, allowing you to learn at your own pace.In addition, the book's companion website featuresinstructional videos, source code, discussion forums, and more, toensure that you have everything you need. The BeagleBone's small size, high performance, low cost,and extreme adaptability have made it a favorite developmentplatform, and the Linux software base allows for complex yetflexible functionality. The BeagleBone has applications in smartbuildings, robot control, environmental sensing, to name a few;and, expansion boards and peripherals dramatically increase thepossibilities. Exploring BeagleBone provides areader-friendly guide to the device, including a crash coursein computer engineering. While following step by step, you can: Get up to speed on embedded Linux, electronics, andprogramming Master interfacing electronic circuits, buses and modules, withpractical examples Explore the Internet-connected BeagleBone and the BeagleBonewith a display Apply the BeagleBone to sensing applications, including videoand sound Explore the BeagleBone's Programmable Real-TimeControllers Hands-on learning helps ensure that your new skills stay withyou, allowing you to design with electronics, modules, orperipherals even beyond the BeagleBone. Insightful guidance andonline peer support help you transition from beginner to expert asyou master the techniques presented in Exploring BeagleBone,the practical handbook for the popular computing platform.

Jetpack Compose by Tutorials (First Edition)

Software-Defined Radio for Engineers

Exploring BeagleBone

Applied Mechanics Reviews

Applied Reconfigurable Computing

A Complete Guide to Programming in C++

SAS/GIS 9.2

An introduction to the engineering principles of embedded systems, with a focus on modeling, design, and analysis of cyber-physical systems. The most visible use of computers and software is processing information for human consumption. The vast majority of computers in use, however, are much less visible. They run the engine, brakes, seatbelts, airbag, and audio system in your car. They digitally encode your voice and construct a radio signal to send it from your cell phone to a base station. They command robots on a factory floor, power generation in a power plant, processes in a chemical plant, and traffic lights in a city. These less visible computers are called embedded systems, and the software they run is called embedded software. The principal challenges in designing and analyzing embedded systems stem from their interaction with physical processes. This book takes a cyber-physical approach to embedded systems, introducing the engineering concepts underlying embedded systems as a technology and as a subject of study. The focus is on modeling, design, and analysis of cyber-physical systems, which integrate computation, networking, and physical processes. The second edition offers two new chapters, several new exercises, and other improvements. The book can be used as a textbook at the advanced undergraduate or introductory graduate level and as a professional reference for practicing engineers and computer scientists. Readers should have some familiarity with machine structures, computer programming, basic discrete mathematics and algorithms, and signals and systems.

The UVM Primer uses simple, runnable code examples, accessible analogies, and an easy-to-read style to introduce you to the foundation of the Universal Verification Methodology. You will learn the basics of object-oriented programming with SystemVerilog and build upon that foundation to learn how to design testbenches using the UVM. Use the UVM Primer to brush up on your UVM knowledge before a job interview to be able to confidently answer questions such as "What is a uvm_agent?," "How do you use uvm_sequences?," and "When do you use the UVM's factory." The UVM Primer's downloadable code examples give you hands-on experience with real UVM code. Ray Salemi uses online videos (on www.uvmprimer.com) to walk through the code from each chapter and build your confidence. Read The UVM Primer today and start down the path to the UVM.

Get started with FPGA programming using SystemVerilog, and develop real-world skills by building projects, including a calculator and a keyboard Key Features Explore different FPGA usage methods and the FPGA tool flow Learn how to design, test, and implement hardware circuits using SystemVerilog Build real-world FPGA projects such as a calculator and a keyboard using FPGA resources Book 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 learn Understand the FPGA architecture and its implementation Get to grips with writing SystemVerilog RTL Make FPGA projects using SystemVerilog programming Work with computer math basics, parallelism, and pipelining Explore the advanced topics of AXI and keyboard interfacing with PS/2 Discover how you can implement a VGA interface in your projects Who 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.
This book is an introduction into digital design with the focus on using the hardware construction language Chisel. Chisel brings advances from software engineering, such as object-orientated and functional languages, into digital design.This book addresses hardware designers and software engineers. Hardware designers, with knowledge of Verilog or VHDL, can upgrade their productivity with a modern language for their next ASIC or FPGA design. Software engineers, with knowledge of object-oriented and functional programming, can leverage their knowledge to program hardware, for example, FPGA accelerators executing in the cloud.The approach of this book is to present small to medium-sized typical hardware components to explore digital design with Chisel.
IOS Animations by Tutorials Second Edition
The Uvm Primer
FPGAs for Software Programmers
Co-verification of Hardware and Software for ARM SoC Design
With Pynq and Machine Learning Applications
The Zynq Book Tutorials for Zybo and Zedboard
Solving PDEs in Python
For many researchers, Python is a first-class tool mainly because of its libraries for storing, manipulating, and gaining insight from data. Several resources exist for individual pieces of this data science stack, but only with the Python Data Science Handbook do you get them all—IPython, NumPy, Pandas, Matplotlib, Scikit-Learn, and other related tools. Working scientists and data crunchers familiar with reading and writing Python code will find this comprehensive desk reference ideal for tackling day-to-day issues: manipulating, transforming, and cleaning data; visualizing different types of data; and using data to build statistical or machine learning models. Quite simply, this is the must-have reference for scientific computing in Python. With this handbook, you ' ll learn how to use: IPython and Jupyter: provide computational environments for data scientists using Python NumPy: includes the ndarray for efficient storage and manipulation of dense data arrays in Python Pandas: features the DataFrame for efficient storage and manipulation of labeled/columnar data in Python Matplotlib: includes capabilities for a flexible range of data visualizations in Python Scikit-Learn: for efficient and clean Python implementations of the most important and established machine learning algorithms
A hands-on introduction to FPGA prototyping and SoC design This Second Edition of the popular book follows the same " learning-by-doing " approach to teach the fundamentals and practices of VHDL synthesis and FPGA prototyping. It uses a coherent series of examples to demonstrate the process to develop sophisticated digital circuits and IP (intellectual property) cores, integrate them into an SoC (system on a chip) framework, realize the system on an FPGA prototyping board, and verify the hardware and software operation. The examples start with simple gate-level circuits, progress gradually through the RT (register transfer) level modules, and lead to a functional embedded system with custom I/O peripherals and hardware accelerators. Although it is an introductory text, the examples are developed in a rigorous manner, and the derivations follow strict design guidelines and coding practices used for large, complex digital systems. The new edition is completely updated. It presents the hardware design in the SoC context and introduces the hardware-software co-design concept. Instead of treating examples as isolated entities, the book integrates them into a single coherent SoC platform that allows readers to explore both hardware and software " programmability " and develop complex and interesting embedded system projects. The revised edition: Adds four general-purpose IP cores, which are multi-channel PWM (pulse width modulation) controller, I2C controller, SPI controller, and XADC (Xilinx analog-to-digital converter) controller. Introduces a music synthesizer constructed with a DDFS (direct digital frequency synthesis) module and an ADSR (attack-decay-sustain-release) envelop generator. Expands the original video controller into a complete stream-based video subsystem that incorporates a video synchronization circuit, a test pattern generator, an OSD (on-screen display) controller, a sprite generator, and a frame buffer. Introduces basic concepts of software-hardware co-design with Xilinx MicroBlaze MCS soft-core processor. Provides an overview of bus interconnect and interface circuit. Introduces basic embedded system software development. Suggests additional modules and peripherals for interesting and challenging projects. The FPGA Prototyping by VHDL Examples, Second Edition makes a natural companion text for introductory and advanced digital design courses and embedded system course. It also serves as an ideal self-teaching guide for practicing engineers who wish to learn more about this emerging area of interest.
This guide was written for readers interested in learning the C++ programming language from scratch, and for both novice and advanced C++ programmers wishing to enhance their knowledge of C++. The text is organized to guide the reader from elementary language concepts to professional software development, with in depth coverage of all the C++ language elements en route.
This book constitutes the refereed proceedings of the 13th International Symposium on Applied Reconfigurable Computing, ARC 2017, held in Delft, The Netherlands, in April 2017. The 17 full papers and 11 short papers presented in this volume were carefully reviewed and selected from 49 submissions. They are organized in topical sections on adaptive architectures, embedded computing and security, simulation and synthesis, design space exploration, fault tolerance, FGPA-based designs, neural neworks, and languages and estimation techniques.
The Designer's Guide to VHDL
Programming for Computations - MATLAB/Octave
The Zynq Book
A Step-By-Step Introduction to the Universal Verification Methodology
A Cyber-Physical Systems Approach
Writing Testbenches: Functional Verification of HDL Models
FPGA Prototyping by VHDL Examples
A Practical Guide to TPM 2.0: Using the Trusted Platform Module in the New Age of Security is a straight-forward primer for developers. It shows security and TPM concepts, demonstrating their use in real applications that the reader can try out. Simply put, this book is designed to empower and excite the programming community to go out and do cool things with the TPM. The approach is to ramp the reader up quickly and keep their interest.A Practical Guide to TPM 2.0: Using the Trusted Platform Module in the New Age of Security explains security concepts, describes the TPM 2.0 architecture, and provides code and ps
code examples in parallel, from very simple concepts and code to highly complex concepts and pseudo-code. The book includes instructions for the available execution environments and real code examples to get readers up and talking to the TPM quickly. The authors then help the users expand on that with pseudo-code descriptions of useful applications using the TPM.