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SAWYER HARRINGTON

FPGA Prototyping by SystemVerilog Examples Newnes

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.

Applied Reconfigurable Computing. Architectures, Tools, and Applications Oxford University Press This book is a collection of best selected research papers presented at the Conference on Machine Learning, Deep Learning and Computational Intelligence for Wireless Communication (MDCWC 2020) held during October 22nd to 24th 2020, at the Department of Electronics and Communication Engineering, National Institute of Technology Tiruchirappalli, India. The presented papers are grouped under the following topics (a) Machine Learning, Deep learning and Computational intelligence algorithms (b)Wireless communication systems and (c) Mobile data applications and are included in the book. The topics include the latest research and results in the areas of network prediction, traffic classification, call detail record mining, mobile health care, mobile pattern recognition, natural language processing, automatic speech processing, mobility analysis, indoor localization, wireless sensor networks (WSN), energy minimization, routing, scheduling, resource allocation, multiple access, power control, malware detection, cyber security, flooding attacks detection, mobile apps sniffing, MIMO detection, signal detection in MIMO-OFDM, modulation recognition, channel estimation, MIMO nonlinear equalization, super-resolution channel and direction-of-arrival estimation. The book is a rich reference material for academia and industry.

The Definitive Guide to the ARM Cortex-M0 Springer Nature

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.

Optimization for Machine Learning Xlibris Corporation

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.

2020 IEEE 63rd International Midwest Symposium on Circuits and Systems (MWSCAS) CRC Press

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.

Experience of PYNQ Springer

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.

Exploring Zynq Mpsoc Springer Nature

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.

Applications in Electronics Pervading Industry, Environment and Society Machine Learning Mastery

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

Examples demonstrating timeless implementation details Proven and practical techniques reflecting the authors' expertise built from years of experience and key advice on tackling critical issues

Deep Learning for Computer Vision Springer

This book presents a study of the use of optimization algorithms in complex image processing problems. The problems selected explore areas ranging from the theory of image segmentation to the detection of complex objects in medical images. Furthermore, the concepts of machine learning and optimization are analyzed to provide an overview of the application of these tools in image processing. The material has been compiled from a teaching perspective. Accordingly, the book is primarily intended for undergraduate and postgraduate students of Science, Engineering, and Computational Mathematics, and can be used for courses on Artificial Intelligence, Advanced Image Processing, Computational Intelligence, etc. Likewise, the material can be useful for research from the evolutionary computation, artificial intelligence and image processing communities.

Dynamically Reconfigurable Systems Elsevier

The Definitive Guide to the ARM Cortex-M0 is a guide for users of ARM Cortex-M0 microcontrollers. It presents many examples to make it easy for novice embedded-software developers to use the full 32-bit ARM Cortex-M0 processor. It provides an overview of ARM and ARM processors and discusses the benefits of ARM Cortex-M0 over 8-bit or 16-bit devices in terms of energy efficiency, code density, and ease of use, as well as their features and applications. The book describes the architecture of the Cortex-M0 processor and the programmers model, as well as Cortex-M0 programming and instruction set and how these instructions are used to carry out various operations. Furthermore, it considers how the memory architecture of the Cortex-M0 processor affects software development; Nested Vectored Interrupt Controller (NVIC) and the features it supports, including flexible interrupt management, nested interrupt support, vectored exception entry, and interrupt masking; and Cortex-M0 features that target the embedded operating system. It also explains how to develop simple applications on the Cortex-M0, how to program the Cortex-M0 microcontrollers in assembly and mixed-assembly languages, and how the low-power features of the Cortex-M0 processor are used in programming. Finally, it describes a number of ARM Cortex-M0 products, such as microcontrollers, development boards, starter kits, and development suites. This book will be useful to both new and advanced users of ARM Cortex devices, from students and hobbyists to researchers, professional embedded- software developers, electronic enthusiasts, and even semiconductor product designers. The first and definitive book on the new ARM Cortex-M0 architecture targeting the large 8-bit and 16-bit microcontroller market Explains the Cortex-M0 architecture and how to program it using practical examples Written by an engineer at ARM who was heavily involved in its development

Applied Reconfigurable Computing. Architectures, Tools, and Applications CRC Press

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

2016 26th International Conference on Field Programmable Logic and Applications Springer Science & Business Media

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, FPGA-based designs, neural networks, and languages and estimation techniques.

Field-Programmable Gate Array Technology Newnes

Recently, AI techniques have received increased attention world-wide and at present 2 industrial drives incorporate some form of AI. This is the first comprehensive book which discusses numerous AI applications to electrical machines and drives.

Machine Learning, Deep Learning and Computational Intelligence for Wireless Communication Springer Nature

Step-by-step tutorials on deep learning neural networks for computer vision in python with Keras.

Digital Design (Verilog) Packt Publishing Ltd

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.

Probability for Machine Learning Springer

Dynamically Reconfigurable Systems is the first ever to focus on the emerging field of Dynamically Reconfigurable Computing Systems. While programmable logic and design-time configurability are well elaborated and covered by various texts, this book presents a unique overview over the state of the art and recent results for dynamic and run-time reconfigurable computing systems.

Reconfigurable hardware is not only of utmost importance for large manufacturers and vendors of microelectronic devices and systems, but also a very attractive technology for smaller and medium-sized companies. Hence, Dynamically Reconfigurable Systems also addresses researchers and engineers actively working in the field and provides them with information on the newest developments and trends in dynamic and run-time reconfigurable systems.

Real World Multicore Embedded Systems Springer

This book constitutes the proceedings of the 15th International Symposium on Applied Reconfigurable Computing, ARC 2019, held in Darmstadt, Germany, in April 2019. The 20 full papers and 7 short papers presented in this volume were carefully reviewed and selected from 52 submissions. In addition, the volume contains 1 invited paper. The papers were organized in topical sections named: Applications; partial reconfiguration and security; image/video processing; high-level synthesis; CGRAs and vector processing; architectures; design frameworks and methodology; convolutional neural networks.

Artificial-Intelligence-based Electrical Machines and Drives Springer

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

scientists.

Applied Reconfigurable Computing. Architectures, Tools, and Applications Springer Nature
Architecture of Network Systems explains the practice and methodologies that will allow you to solve a broad range of problems in system design, including problems related to security, quality of service, performance, manageability, and more. Leading researchers Dimitrios Serpanos and Tilman Wolf develop architectures for all network sub-systems, bridging the gap between operation and VLSI. This book provides comprehensive coverage of the technical aspects of network systems, including system-on-chip technologies, embedded protocol processing and high-performance, and low-power design. It develops a functional approach to network system architecture based on the OSI reference model, which is useful for practitioners at every level. It also covers both fundamentals and the latest developments in network systems architecture, including network-on-chip, network processors, algorithms for lookup and classification, and network systems for the next-generation Internet. The book is recommended for practicing engineers designing the architecture of network systems and graduate students in computer engineering and computer science studying network system design. This is the first book to provide comprehensive coverage of the technical aspects of network systems, including processing systems, hardware technologies, memory managers, software routers, and more. Develops a systematic approach to network architectures, based on the OSI reference model, that is useful for practitioners at every level. Covers both the important basics and cutting-edge topics in network systems architecture, including Quality of Service and Security for mobile, real-time P2P services, Low-Power Requirements for Mobile Systems, and next generation Internet systems.

Architecture of Network Systems Simon and Schuster

This book constitutes the proceedings of the 16th International Symposium on Applied Reconfigurable Computing, ARC 2020, held in Toledo, Spain, in April 2020. The 18 full papers and 11 poster presentations presented in this volume were carefully reviewed and selected from 40 submissions. The papers are organized in the following topical sections: design methods & tools; design space exploration & estimation techniques; high-level synthesis; architectures; applications.