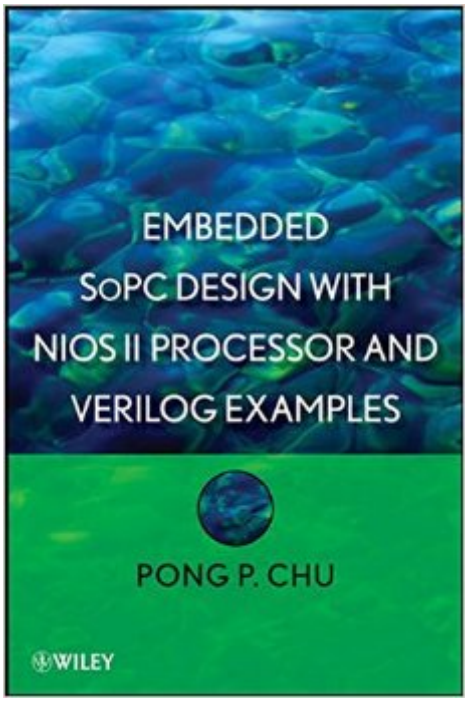
Embedded SoPC Design With Nios II Processor And Verilog Examples



Synopsis

Explores the unique hardware programmability of FPGA-based embedded systems, using a learn-by-doing approach to introduce the concepts and techniques for embedded SoPC design with Verilog An SoPC (system on a programmable chip) integrates a processor, memory modules, I/O peripherals, and custom hardware accelerators into a single FPGA (field-programmable gate array) device. In addition to the customized software, customized hardware can be developed and incorporated into the embedded system as well—allowing us to configure the soft-core processor, create tailored I/O interfaces, and develop specialized hardware accelerators for computation-intensive tasks. Utilizing an Altera FPGA prototyping board and its Nios II soft-core processor, Embedded SoPC Design with Nios II Processor and Verilog Examples takes a "learn by doing" approach to illustrate the hardware and software design and development process by including realistic projects that can be implemented and tested on the board. Emphasizing hardware design and integration throughout, the book is divided into four major parts: Part I covers HDL and synthesis of custom hardware Part II introduces the Nios II processor and provides an overview of embedded software development Part III demonstrates the design and development of hardware and software of several complex I/O peripherals, including a PS2 keyboard and mouse, a graphic video controller, an audio codec, and an SD (secure digital) card Part IV provides several case studies of the integration of hardware accelerators, including a custom GCD (greatest common divisor) circuit, a Mandelbrot set fractal circuit, and an audio synthesizer based on DDFS (direct digital frequency synthesis) methodology While designing and developing an embedded SoPC can be rewarding, the learning can be a long and winding journey. This book shows the trail ahead and guides readers through the initial steps to exploit the full potential of this emerging methodology.

Book Information

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Customer Reviews

Dr. Pong P. Chu is Associate Professor in the Department of Electrical and Computer Engineering at Cleveland State University in Ohio. He has taught undergraduate- and graduate-level digital systems and computer architecture courses for more than a decade and has received instructional grants from the National Science Foundation and Cleveland State University.

Embedded SoPC Design with Nios II Processor and Verilog Examples Digital Design (Verilog): An Embedded Systems Approach Using Verilog VLSI Chip Design with the Hardware Description Language VERILOG: An Introduction Based on a Large RISC Processor Design The Verilog PLI Handbook: A User's Guide and Comprehensive Reference on the Verilog Programming Language Interface Embedded DSP Processor Design, : Application Specific Instruction Set Processors (Systems on Silicon) FPGA Prototyping By Verilog Examples: Xilinx Spartan-3 Version Digital Design with RTL Design, VHDL, and Verilog Design Patterns for Embedded Systems in C: An Embedded Software Engineering Toolkit Digital Integrated Circuit Design Using Verilog and Systemverilog Digital VLSI Design with Verilog: A Textbook from Silicon Valley Polytechnic Institute Digital Systems Design: A Practical Approach: The Verilog Edition Digital VLSI Design with Verilog: A Textbook from Silicon Valley Technical Institute Design Through Verilog HDL Digital Design: With an Introduction to the Verilog HDL 5th Ed. By Morris Mano (International Economy Edition) DSP Software Development Techniques for Embedded and Real-Time Systems (Embedded Technology) Embedded Systems Architecture: A Comprehensive Guide for Engineers and Programmers (Embedded Technology) Linux for Embedded and Real-time Applications, Third Edition (Embedded Technology) Linux for Embedded and Real-time Applications (Embedded Technology) Linux for Embedded and Real-time Applications, Second Edition (Embedded Technology) Applied Control Theory for Embedded Systems (Embedded Technology)