

Embedded Microprocessor System Design using FPGAs

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.

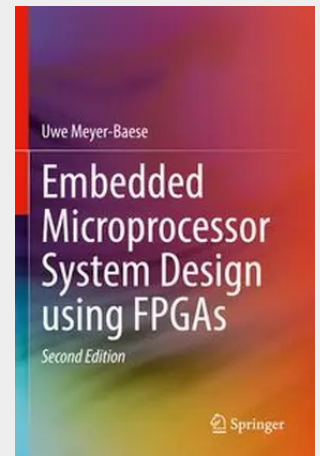
New additions in the second edition include bottom-up and top-down FPGA-based Linux OS system designs for Altera/Intel® and Xilinx® boards and application development running on the OS using modern popular programming languages: Python, Java, and JavaScript/HTML/CSSs.

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.

For the three new OS enabled programming languages a substantial number of examples ranging from basic math and networking to image processing and video animations are provided.

Each Chapter has a substantial number of short quiz questions, exercises, and challenging projects.

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