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Design Of Computers And Other Complex Digital Devices



Synopsis

Intended for junior/senior level advanced Computer Design courses in departments of electrical engineering and computer related departments. This text serves as a practical guide for the design of complex digital logic circuits, utilizing a modified and extended version of the basic ASM (Algorithmic State Machine) method. Unlike other texts, this text focuses on computer design rather than computer architecture, dealing with the detailed gate-level logic design of a basic computer system. It teaches the theory behind advanced digital design and uses several examples to help illustrate and clarify concepts and methods required for the design and implementation of a commercial microprocessor.

Book Information

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Customer Reviews

Complete step-by-step guide; This extremely detailed method walks the student through the entire process of designing an 8-bit microprocessor. Provides students with detailed instruction to help ensure success. Modified and expanded ASM method; Is presented as a systematic 5-step method to be used in any digital hardware device. Introduces students to an expanded application of the well-known ASM method. Appendix section with laboratory experiments; Lab experiments follow the presentation of the text material. Provides students with the opportunity for direct application of the text materials. Implementation of the Intel 8080; Covers the design process of an actual commercial microprocessor rather than a

fictional computer as the design target. Gives students hands-on experience applying design concepts explored in class in a real-life situation. Three part organization; Part I provides an overview of basic digital logic design. Part II explores the use of programmable logic devices, hardware description languages, and the modified ASM method for the implementation of general algorithms in hardware. Part III presents the design and implementation of an 8-bit microprocessor using the VHDL description, FPGA configuration, and the ASM design method. Provides instructors with a clear organization of course material for easier presentation. Companion website; Includes all the codes and figures with additional material for reference. Provides instant access to useful material and supplementary information.

The author provides in-depth explanation of the advantages of using ASM for digital designs plus some explanation on the design methodology towards FPGA (Xilinx). Lots of design examples in ASM and the equivalent VHDL codes for users to try, learn and understand. Suitable for beginners and advanced designers to start trying the ASM design methodology to take advantage of the systematic and heuristic design approach using ASM as introduced by the author. In fact, there're tools supporting the direct ASM approach, and the book would become a very good methodology reference.

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