


# Computation Structures (MIT Electrical Engineering and Computer Science)

*By Stephen Ward, Robert Halstead*

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**Computation Structures (MIT Electrical Engineering and Computer Science)** By Stephen Ward, Robert Halstead

Developed as the text for the basic computer architecture course at MIT, Computation Structures integrates a thorough coverage of digital logic design with a comprehensive presentation of computer architecture. It contains a wealth of information for those who design computers or work with computer systems, spanning the entire range of topics from analog circuit design to operating systems. Ward and Halstead seek to demystify the construction of computing hardware by illustrating systematically how it is built up from digital circuits through higher level components to processors and memories, and how its design is affected by its intended uses.Computation Structures is unusually broad in scope, considering many real world problems and tradeoff decisions faced by practicing engineers. These difficult choices are confronted and given careful attention throughout the book.Topics addressed include the digital abstraction; digital representations and notation; combinational devices and circuits; sequence and state; synthesis of digital systems; finite state machines; control structures and disciplines; performance measures and tradeoffs; communication; interpretation; microinterpreter architecture; microprogramming and microcode; single sequence machines; stack architectures; register architectures; reduced instruction set computers; memory architectures; processes and processor multiplexing; process synchronization; interrupts, priorities, and real time; directions and trends.Stephen A. Ward and Robert H. Halstead are both Associate Professors of Computer Science and Electrical Engineering at MIT. Computation Structures is included in the MIT Electrical Engineering and Computer Science series.

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## Editorial Review

Amazon.com Review
*Computation Structures* focuses on computer architecture as a complicated problem in digital design. As such, the initial sections discuss the basic principles of designing digital circuits and systems. The context is subsequently used to discuss more and more advanced ideas without a lot of confusing structure. For example, pipelining is initially discussed in terms of speeding up simple arithmetic circuits, which allows the reader to focus on the conceptual issues of pipelining rather than the embedded problem. Using this aggregative approach, the authors build their way up through a series of simple machines to begin talking about processes and process semantics. In addition, *Computation Structures* contains a nice section on microcode, which is seldom discussed in most books. The text is clear and the exercises well chosen.

## Users Review

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**Marcos Gorman:**

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