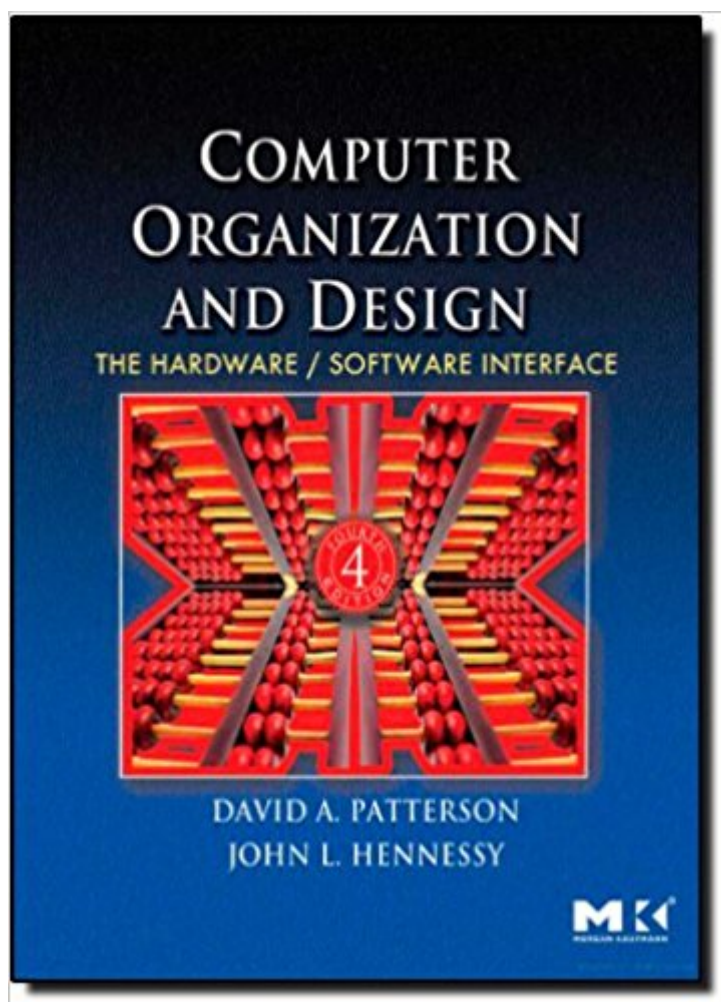


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# Computer Organization And Design, Fourth Edition: The Hardware/Software Interface (The Morgan Kaufmann Series In Computer Architecture And Design)





## Synopsis

The best-selling computer organization book is thoroughly updated to provide a new focus on the revolutionary change taking place in industry today: the switch from uniprocessor to multicore microprocessors. This new emphasis on parallelism is supported by updates reflecting the newest technologies, with examples highlighting the latest processor designs and benchmarking standards. As with previous editions, a MIPS processor is the core used to present the fundamentals of hardware technologies, assembly language, computer arithmetic, pipelining, memory hierarchies and I/O. Sections on the ARM and x86 architectures are also included. Covers the revolutionary change from sequential to parallel computing, with a new chapter on parallelism and sections in every chapter highlighting parallel hardware and software topics. Includes a new appendix by the Chief Scientist and the Director of Architecture of NVIDIA covering the emergence and importance of the modern GPU, describing in detail for the first time the highly parallel, highly multithreaded multiprocessor optimized for visual computing. Describes a novel approach to measuring multicore performance--the "Roofline model"--with benchmarks and analysis for the AMD Opteron X4, Intel Xeon 5000, Sun UltraSPARC T2, and IBM Cell. Includes new content on Flash memory and Virtual Machines. Provides a large, stimulating set of new exercises, covering almost 200 pages. Features the AMD Opteron X4 and Intel Nehalem as real-world examples throughout the book. Updates all processor performance examples using the SPEC CPU2006 suite.

## Book Information

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## Customer Reviews

Patterson and Hennessy have greatly improved what was already the gold standard of textbooks. In the rapidly-evolving field of computer architecture, they have woven an impressive number of recent case studies and contemporary issues into a framework of time-tested fundamentals.--Fred Chong, University of California, Santa Barbara The new coverage of multiprocessors and parallelism lives up to the standards of this well-written classic. It provides well-motivated, gentle introductions to the new topics, as well as many details and examples drawn from current hardware.--John Greiner, Rice University

Computer Organization and Design The Hardware/Software Interface David A. Patterson and John L. Hennessy Patterson and Hennessy have greatly improved what was already the gold standard of textbooks. In the rapidly-evolving field of computer architecture, they have woven an impressive number of recent case studies and contemporary issues into a framework of time-tested fundamentals.--Fred Chong, University of California, Santa Barbara The new coverage of multiprocessors and parallelism lives up to the standards of this well-written classic. It provides well-motivated, gentle introductions to the new topics, as well as many details and examples drawn from current hardware.--John Greiner, Rice University The best-selling computer organization book is thoroughly updated to provide a new focus on the revolutionary change taking place in industry today: the switch from uniprocessor to multicore microprocessors. This new emphasis on parallelism is supported by updates reflecting the newest technologies, with examples highlighting the latest processor designs and benchmarking standards. As with previous editions, a MIPS processor is the core used to present the fundamentals of hardware technologies, assembly language, computer arithmetic, pipelining, memory hierarchies and I/O. Sections on the ARM and x86 architectures are also included. Fourth Edition Features: Covers the revolutionary change from sequential to parallel computing, with a new chapter on parallelism and sections in every chapter highlighting parallel hardware and software topics. Includes a new appendix by the Chief Scientist and the Director of Architecture of NVIDIA covering the emergence and importance of the modern GPU, describing in detail for the first time the highly parallel, highly multithreaded multiprocessor optimized for visual computing. Describes a novel approach to measuring multicore performance--the "Roofline model"--with benchmarks and analysis for the AMD Opteron X4, Intel Xeon 5000, Sun UltraSPARC T2, and IBM Cell. Includes new content on Flash memory and Virtual

Machines. Provides a large, stimulating set of new exercises, covering almost 200 pages. Features the AMD Opteron X4 and Intel Nehalem as real-world examples throughout the book. Updates all processor performance examples using the SPEC CPU2006 suite.

This book was very informative and clear. I had it as an assigned textbook for a class called Computer Organization. I really enjoyed and benefited from the way the book was laid out. Important definitions were easy to find. Examples were used a lot to make each point clear. Using the questions at the end of each chapter was the easiest way for me to study for tests. Every now and then, however, the organization of the book would confuse me, and some of the questions were very poorly worded. I had trouble figuring out what they were asking me to do in some cases. This is certainly one of the better textbooks I've had, but it would've been greatly improved by more available solutions so that students could check their work. Now, that may be my opinion because my professor graded homework for completeness and not correctness and I was struggling to know if all my hard work was done right or not. Either way, some solutions to problems would have been very helpful.

This book is very valuable for any college student of Computer Science and a must have for anyone working with computer architecture. The topics covered are diverse, lacking a bit of depth in several of them. At times the text is repeatable because different components sometimes behave similarly. The book comes with a CD with more subjects. It's not very intuitive to use, but serves to prevent the book to be even bigger and more expensive. Yet the book is too big to be carrying around and usually I use it only at home.

This is a must-read book for students and engineers who want to know how computer works. It covers most of fundamental areas of computer architecture including very recent technologies, such as multicores and mutiprocessors. It gives readers solid framework of computer architecture and guides them to further specific technologies. I was very excited to read the chapter four, The Processor, which describes the complicated concept of processor very easily and step by step. Specially this book provides readers with plenty of examples that help readers understand the topics clearly. I would like to strongly recommend to read this book.

This book makes reading about computer architecture very entertaining. The author is enthusiastic and also very knowledgeable about the subject topic. There are great reference pages in the

appendices and throughout the book. Very worth it and excellent price.

This book is very informative and is perfect for those wanting to learn about computer architecture and machine language.

This book was used for my introduction Computer Arch. class and it felt like it was a bit too difficult in content for an introductory book. Most of the content went over my head without further research external from the book.

Solid book for those looking to learn what goes beyond programming in high level languages

This is the textbook for my Computer Organization class and has been challenging to read through. It presents a lot of information but I don't feel it is presented in a very clear organized way. More like it throws a lot of information at you and you have to figure out that the three different equations it just showed you are really all the same one just with different labeling. The exercises range from easy to "what in the world are they asking me?" Overall it feels that they are unsure who their audience is and randomly switch from easily understandable information to getting very technical and assuming that you already have a lot of background in what they are covering.

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