Computer Architecture, Fifth Edition: A Quantitative Approach (The Morgan Kaufmann Series in Computer Architecture and Design)

By John L. Hennessy, David A. Patterson

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The computing world today is in the middle of a revolution: mobile clients and cloud computing have emerged as the dominant paradigms driving programming and hardware innovation today. The Fifth Edition of *Computer Architecture* focuses on this dramatic shift, exploring the ways in which software and technology in the cloud are accessed by cell phones, tablets, laptops, and other mobile computing devices. Each chapter includes two real-world examples, one mobile and one datacenter, to illustrate this revolutionary change.

- Updated to cover the mobile computing revolution
- Emphasizes the two most important topics in architecture today: memory hierarchy and parallelism in all its forms.
- Develops common themes throughout each chapter: power, performance, cost, dependability, protection, programming models, and emerging trends ("What's Next")
- Includes three review appendices in the printed text. Additional reference appendices are available online.
- Includes updated Case Studies and completely new exercises.

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Editorial Review

Amazon.com Review

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New this Edition

- Each chapter includes two new, real-world examples, one mobile and one data center, to illustrate the revolutionary change to personal mobile devices and cloud computing.
- Expanded and improved coverage of multicore and GPU architectures.
- Completely new chapters on warehouse-scale (cloud) computers (Chapter 6) and vector processors and GPUs (Chapter 4).
- New "Putting it All Together" sections exploring real-world applications, including the pipeline organizations and memory hierarchies of the ARM Cortex A8 processor; the Intel core i7 processor; the NVIDIA GTX-280 and GTX-480 GPUs; and warehouse-scale computing at Google.
- Improvements and updates throughout, including updated performance analysis data featuring the new SPECPower benchmark.

Review

"What has made this book an enduring classic is that each edition is not an update, but an extensive revision that presents the most current information and unparalleled insight into this fascinating and fast changing field. For me, after over twenty years in this profession, it is also another opportunity to experience that student-grade admiration for two remarkable teachers." ? *From the Foreword by* Luiz André Barroso, Google, Inc.

"This is an academic textbook that is also suitable for a far broader readership. Each chapter is organised in the same structure, with the main content supported by case studies and exercises… Having read this book I now have a far better understanding of why processors from all the different designers and manufacturers are

so different. Memory hierarchies, multicore architectures and compiler optimisation are all covered in great detail. I was particularly interested in their discussion of graphical processing units and how they are suitable for far more than just graphical workloads… What is great about this book is that it moves with the times. There is a lot of content on processors for mobile computing, and power usage is a pervasive theme. At the other extreme there is an excellent chapter on warehouse scale computers, which offers tremendous insight into the cloud computing infrastructure provided by Google, Amazon and others. If your job has anything to do with IT infrastructure then I recommend this book as a must-read. As an academic text book it has both depth and breadth. And if you're just interested in the topic you'll gain a huge amount of insight into the fundamentals of computer architecture."--The Chartered Institute for IT

About the Author
John L. Hennessy is a Professor of Electrical Engineering and Computer Science at Stanford University, where he has been a member of the faculty since 1977 and was, from 2000 to 2016, its tenth President. Prof. Hennessy is a Fellow of the IEEE and ACM; a member of the National Academy of Engineering, the National Academy of Science, and the American Philosophical Society; and a Fellow of the American Academy of Arts and Sciences. Among his many awards are the 2001 Eckert-Mauchly Award for his contributions to RISC technology, the 2001 Seymour Cray Computer Engineering Award, and the 2000 John von Neumann Award, which he shared with David Patterson. He has also received seven honorary doctorates.

David A. Patterson is the Pardee Chair of Computer Science, Emeritus at the University of California Berkeley. His teaching has been honored by the Distinguished Teaching Award from the University of California, the Karlstrom Award from ACM, and the Mulligan Education Medal and Undergraduate Teaching Award from IEEE. Patterson received the IEEE Technical Achievement Award and the ACM Eckert-Mauchly Award for contributions to RISC, and he shared the IEEE Johnson Information Storage Award for contributions to RAID. He also shared the IEEE John von Neumann Medal and the C & C Prize with John Hennessy. Like his co-author, Patterson is a Fellow of the American Academy of Arts and Sciences, the Computer History Museum, ACM, and IEEE, and he was elected to the National Academy of Engineering, the National Academy of Sciences, and the Silicon Valley Engineering Hall of Fame. He served on the Information Technology Advisory Committee to the U.S. President, as chair of the CS division in the Berkeley EECS department, as chair of the Computing Research Association, and as President of ACM. This record led to Distinguished Service Awards from ACM, CRA, and SIGARCH.

Users Review

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Yvonne Matz:

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Augustus Chase:

Computer Architecture, Fifth Edition: A Quantitative Approach (The Morgan Kaufmann Series in Computer Architecture and Design) can be one of your beginning books that are good idea. We all recommend that straight away because this publication has good vocabulary that may increase your knowledge in language, easy to understand, bit entertaining but delivering the information. The article writer giving his/her effort that will put every word into enjoyment arrangement in writing Computer Architecture, Fifth Edition: A Quantitative Approach (The Morgan Kaufmann Series in Computer Architecture and Design) nevertheless doesn't forget the main level, giving the reader the hottest along with based confirm resource facts that maybe you can be certainly one of it. This great information can drawn you into brand new stage of crucial contemplating.

Jean Cunningham:

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