

# Homayoun

# Reference 41

JOHN L. HENNESSY

DAVID A. PATTERSON

# COMPUTER ARCHITECTURE

*A Quantitative Approach*

FIFTH EDITION

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## In Praise of *Computer Architecture: A Quantitative Approach* Fifth Edition

“The 5th edition of *Computer Architecture: A Quantitative Approach* continues the legacy, providing students of computer architecture with the most up-to-date information on current computing platforms, and architectural insights to help them design future systems. A highlight of the new edition is the significantly revised chapter on data-level parallelism, which demystifies GPU architectures with clear explanations using traditional computer architecture terminology.”

—Krsteljan Asanović, University of California, Berkeley

“*Computer Architecture: A Quantitative Approach* is a classic that, like fine wine, just keeps getting better. I bought my first copy as I finished up my undergraduate degree and it remains one of my most frequently referenced texts today. When the fourth edition came out, there was so much new material that I needed to get it to stay current in the field. And, as I review the fifth edition, I realize that Hennessy and Patterson have done it again. The entire text is heavily updated and [Chapter 6](#) alone makes this new edition required reading for those wanting to really understand cloud and warehouse scale-computing. Only Hennessy and Patterson have access to the insiders at Google, Amazon, Microsoft, and other cloud computing and internet-scale application providers and there is no better coverage of this important area anywhere in the industry.”

—James Hamilton, Amazon Web Services

“Hennessy and Patterson wrote the first edition of this book when graduate students built computers with 50,000 transistors. Today, warehouse-size computers contain that many servers, each consisting of dozens of independent processors and billions of transistors. The evolution of computer architecture has been rapid and relentless, but *Computer Architecture: A Quantitative Approach* has kept pace, with each edition accurately explaining and analyzing the important emerging ideas that make this field so exciting.”

—James Larus, Microsoft Research

“This new edition adds a superb new chapter on data-level parallelism in vector, SIMD, and GPU architectures. It explains key architecture concepts inside mass-market GPUs, maps them to traditional terms, and compares them with vector and SIMD architectures. It’s timely and relevant with the widespread shift to GPU parallel computing. *Computer Architecture: A Quantitative Approach* furthers its string of firsts in presenting comprehensive architecture coverage of significant new developments!”

—John Nickolls, NVIDIA

“The new edition of this now classic textbook highlights the ascendance of explicit parallelism (data, thread, request) by devoting a whole chapter to each type. The chapter on data parallelism is particularly illuminating: the comparison and contrast between Vector SIMD, instruction level SIMD, and GPU cuts through the jargon associated with each architecture and exposes the similarities and differences between these architectures.”

—Kunle Olukotun, Stanford University

“The fifth edition of *Computer Architecture: A Quantitative Approach* explores the various parallel concepts and their respective tradeoffs. As with the previous editions, this new edition covers the latest technology trends. Two highlighted are the explosive growth of Personal Mobile Devices (PMD) and Warehouse Scale Computing (WSC)—where the focus has shifted towards a more sophisticated balance of performance and energy efficiency as compared with raw performance. These trends are fueling our demand for ever more processing capability which in turn is moving us further down the parallel path.”

—Andrew N. Sloss, Consultant Engineer, ARM  
Author of *ARM System Developer's Guide*



# **Computer Architecture** A Quantitative Approach

*Fifth Edition*

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