

# **Computer Architecture**

Stephen Bucaro

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Want to know what's inside a microprocessor? Books on computer architecture are scarce, and when you do find one, not only does it cost a small fortune, but it's also loaded with register transfer code, assembly language programming, and complicated mathematics. Another thing they like to do is dog out a long boring history of how computers got started, starting with Charles Babbage's Difference Engine in 1834.

All that's wonderful if you're going to design the latest octa-core microprocessor chip for Intel or AMD. But what if you just want a basic understanding of how a microprocessor works? That's what you get from this book.

You'll learn how semiconductors and computer chips are manufactured and packaged. You'll get an introduction to binary mathematics, hexadecimal encoding, digital logic circuitry, and binary floating-point mathematics. Then you'll learn, from simple block diagrams, about the basic architecture of a computer, the microarchitectures used by AMD and Intel, and the basic architecture of a microprocessor.

You'll learn that the microprocessor may not be the most important component of a computer, as much of a computer's performance is determined by two highly integrated chips called simply the "chipset".

You'll learn that the fetch-decode-execute cycle is paramount to the functioning of a stored program computer. Then you'll focus on the building blocks of a microprocessor; the Registers, BIU, ALU, FPU, IRQ, DMA, various buses, caches, and how hardware and software work with the different layers.

You'll learn the difference between an MCU, MPU, and CPU, and you'll learn about several low-cost microcontroller project circuit boards available on the market that you connect to your computer with a USB cable and use their software to program the microcontroller and build projects to learn microcontroller programming the easy fun way.

You'll continue to learn about the latest microprocessor technologies, like pipelining, superscalar, hyperthreading, multi-core processors, virtual memory, dual port memory, memory paging, video memory and how a video display works.

Explained in clear, simple easy-to-understand language and highly illustrated; this book contains more than 180 tables, charts, diagrams, and pictures.

Hey, if some day you want to design the latest octa-core microprocessor chip for Intel or AMD, you've got to get started somewhere. This book gets you started.



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