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MIPS RISC Architecture (2nd Edition)

Introducing the R4000 Technology

MIPS RISC ARCHITECTURE

BY GERRY KANE AND JOE HEINRICH

MIPS RISC Processors. Reference for the R2000, R3000, R6000, and the new R4000 Reduced Instruction Set Computer Architecture.
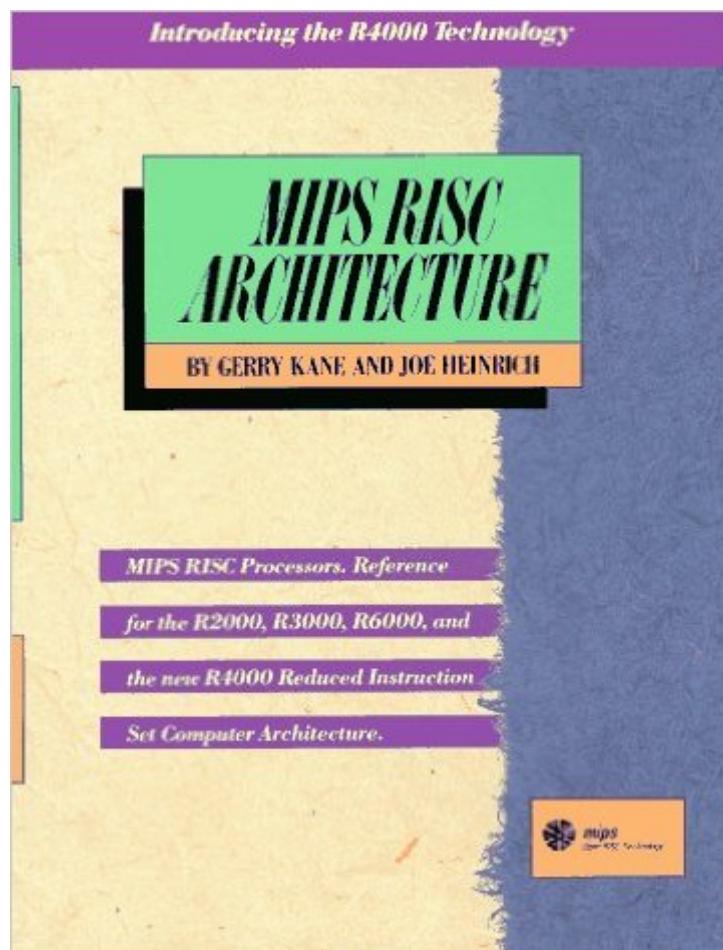
Synopsis

A complete reference manual to the MIPS RISC architecture, this book describes the user Instruction Set Architecture (ISA), by the R2000, R3000, R4000, and R6000 (collectively known as the R-Series) processors, together with an extension to this ISA. Focusing on the new R4000 and R6000 chips, this book is organized into two major sections: Chapters 1 through 6 describe the characteristics of the CPU, while Chapter 7 through 9 describe the Floating Point Unit (FPU). This book describes the general characteristics and capabilities of each RISC processor, along with a description of the programming model, memory management unit (MMU), and the registers associated with each processor. Also included is an overview of the underlying concepts that distinguish RISC architecture from Complex Instruction Set Computer (CISC) architecture.

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Customer Reviews

The first edition of this book (MIPS RISC Architecture, by Gerry Kane, ISBN 0135847494) was an excellent book: it described well and completely the R2000/R3000 processors, their instructions, and how to program them.This, the second edition, tries to expand on that, but does a stunningly poor job. While is has been expanded slightly to cover some R6000 and R4000 topics (e.g. some changes to the CP0 architecture), it fails horribly at describing at crucial elements of the R4000. For instance: the fact that the R4000 is a 64-bit CPU. Very few of the instructions that first appeared in the R4000 are described, and in particular the 64-bit CPU instructions seem to be omitted entirely.

Worse, some of the text, e.g., relating to CP1 (FPU) data types and registers, which was perfectly clear in the first edition has been muddied by generalizing it for R6000/R4000. The result is that this edition fails to present a clear picture of *either* the R2000/R3000 or later MIPS processors.If you're interested in learning about MIPS architecture, even historical (R2000/R3000) MIPS architecture, I'd suggest looking elsewhere: See MIPS Run is quite good (but not excellent in my opinion) and covers a wide range of topics. The first edition of this book is an excellent reference about R2000/R3000, but is limited to them. The MIPS architecture documentation manuals from MIPS themselves tend to be clear and complete references, but lacking in background information. I'd bet that many other MIPS-related books are great. But this one isn't.

The book has a good amount of solid information. What I mean by solid, is it has the "real" information you need to understand the MIPS architecture. It is well written and very understandable. It is more understandable than many other architecture books I have used before.

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