Principles of Parallel Programming  
by Larry Snyder

Excellent Introductory Text, Both Timely And Timeless

With the rise of multi-core architecture, parallel programming is an increasingly important topic for software engineers and computer system designers. Written by well-known researchers Larry Snyder and Calvin Lin, this highly anticipated first edition emphasizes the principles underlying parallel computation, explains the various phenomena, and clarifies why these phenomena represent opportunities or barriers to successful parallel programming. Ideal for an advanced upper-level undergraduate course, Parallel Programming supplies enduring knowledge that will outlive the current hardware and software, aiming to inspire future researchers to build tomorrows solutions. ...the first basic book on the subject that I've ever seen that seems to have the pulse on the true issues of parallelism that are relevant for students. --Alan Edelman, MIT Principles of Parallel Programming is a wonderful book and I plan to use it in our new parallel programming course.....Peiyi Tang, University of Arkansas, Little Rock

I like [Principles of Parallel Programming] very much for a few specific reasons: its concise, covers the most relevant topics but does not take thousand pages to do it, it is hands on and it covers. ..recent developments with multi-core and GPGPU. --Edin Hodzic, Santa Clara University

My Personal Review:
I have done parallel programming on a variety of machines for many years, and have written some widely-used parallel numerical software. Now that I have graduate students of my own and teach courses in numerical and parallel computation, I've been hoping for a book like this to help my students understand the basic techniques, concepts, and problems common to most parallel programming, as well as to use as a reference for courses, without resorting to manuals bogged down in the details of specific architectures. A colleague of mine (who has a large company developing parallel tools and who for many years has taught a course on parallel scientific computing) pointed me to this text, and I'm much more pleased with it than with any recent book on the subject that I can recall.
The authors of this book clearly introduce key concepts of extracting parallelism, load balancing, performance analysis, and memory management with a number of well-selected examples and advice clearly stemming from long experience in the field. They describe numerous general principles in an accessible way, without getting bogged down in the theoretical models of dubious utility that are too common in this field. The book is timely, in that it exhibits a clear awareness of current architectural trends, but remains rightly focused on timeless ideas.

I suppose the authors cannot be blamed for devoting a chapter to the parallel programming language they have developed in their own work (ZPL), and it is balanced by chapters on the current popular low-level techniques like MPI and threads as well as brief discussions of other proposed high-level languages (although the mention of Cilk is a bit too brief for my tastes). But the real strength of the book is that it is not tied too closely to any particular language or implementation, and instead helps you to recognize fundamental ideas as they appear in various forms.

I do wish the book were a bit cheaper, but high textbook prices seem to be a fact of life. A more basic introduction to caches, and the connection between memory locality on serial computers and locality on parallel machines, would probably be helpful. The mention of the powerful idea of work stealing is too brief. And I'm sure I'll find many other things I dislike as I continue to use this book, but overall I'm quite happy with this book as a way to get students into this subject.

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