7[68–02, 68Q22].—LYDIA KRONSJÖ & DEAN SHUMSHERUDDIN (Editors), *Advances in Parallel Algorithms*, Wiley, New York, 1992, xiv + 481 pp., 24 cm. Price $69.95.

This is a useful collection of essays on parallel computing, providing broad surveys of very fundamental subjects such as parallel programming paradigms and parallel computational complexity, as well as more specialized topics. It includes provocative introductions to several topics such as parallel algorithms for dynamic programming, branch and bound, discrete event simulation, packet routing, genetic algorithms, neural network algorithms, matrix algorithms, and others.

The book begins with a reasonably comprehensive survey of parallel programming paradigms. It is generally well written, except that there is very little comparison of different paradigms. This reviewer prefers surveys which are more than a list, even at the expense of the biases of the author creeping in. The other chapter on programming paradigms discusses a language/system called Divacon, which purports to be based on the familiar divide and conquer paradigm of algorithm design. Divide and conquer is obviously a great programming strategy, but the chapter does not convince this reviewer that a restricted model of divide and conquer is likely to be better than standard languages with simple constructs. The chapter does discuss interesting ideas, except that they are attributed to Divacon, when they were clearly developed earlier.

The chapter on parallel complexity theory is somewhat disappointing. One would expect a chapter titled "computational complexity" to be based on reasonably rigorous material: description (or perhaps mention) of interesting fast algorithms for problems that do not appear to parallelize well, and (formal) obstacles in parallelization, e.g. P-completeness, Kung's result on recurrences, and a listing of problems which have eluded parallel algorithms. Instead, one finds definitions of scalability, speedup, long informal discussion of spatial and temporal locality, detailed descriptions of the Bulk Synchronous PRAM model, which while important, does not have much to do with fundamental issues in parallel algorithm complexity.

The chapters dealing with specialized topics in parallel computation are more interesting, for instance the chapter on packet routing on arrays. The chapters on parallel branch and bound and discrete event simulation were informative as well as provocative, though sometimes only providing a bland survey without much comparison among approaches.

The book also leaves much to be desired as far as editing is concerned. Often, chapters repeat material from other chapters, and preliminary material (e.g., the discussion of speedup, scalability) that should occur in initial chapters occurs towards the end. The chapter on parallel derandomization techniques certainly discusses important and exciting ideas, but is hard to read because of grammatical errors, as well as repetition.

In spite of the drawbacks, the collection is useful. There are very few books which even attempt to encompass such a broad field; and the book should be of use to the general reader.

ABHIRAM RANADE

Computer Science Division
University of California
Berkeley, CA 94720