Book Review

Parallel Programming: Techniques and Applications Using Networked Workstations and Parallel Computers

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This book makes a clear presentation of the traditional topics included in a course of undergraduate parallel programming. As explained by the authors, it was developed from their own experience in classrooms, introducing their students to parallel programming. It can be used almost directly to teach basic parallel programming.

It is divided in two main parts. Part I is devoted to parallel techniques making a comprehensive step forward from sequential to parallel programming. It is further divided in eight chapters, including a brief but clear enough description of parallel computers, message passing and shared memory programming both oriented towards networked workstations, and topics on: embarrassingly parallel computations, partitioning and divide-and-conquer strategies, pipelined computations, synchronous computations, and load balancing and termination detection.

Part II is devoted to algorithms and applications. It takes four traditional applications in the parallel processing field: sorting algorithms, numerical algorithms, image processing, and searching and optimization. Every chosen algorithm is fully explained including sections of code, graphs, and possible processing hardware architectures.

Every chapter has a very good set of references, some of them included and explained in the section Further Reading. Given the developments made on the area, they are both necessary and useful. Most of the parallel programs (or parts of them) are presented using PVM or MPI, which are available and extensively used in networks of workstations.

From an undergraduate course of parallel processing point of view the book is good enough and easy to read and experiment. Also, the analytical point of view of the algorithms (in terms of order of magnitude and execution time) gives a very good introduction to parallel algorithm analysis in general.

The main drawback of the book resides in the self imposed restriction of the presentations only to the original and classical subjects, which were mainly developed for the classical

and/or *ad hoc* made parallel computers. From this point of view, networked workstations are no more than a cheap and highly available classroom environment for implementation. This may produce a distorted view of parallel processing on these parallel architectures, given that most (if not all) of the traditional parallel algorithms should be adapted to have reasonable values of performance metrics such as speed up and efficiency. Also, networks of workstations are extremely useful not only to experiment in a distributed parallel environment but to show that many times even minimal rearrangements of algorithms could be necessary and highly beneficial.

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