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EDITORIAL

This special issue contains a selection of papers that had been presented at the Second International Conference on Parallel Computing Systems (PCS'99), Ensenada, Baja California, Mexico, August 16-20, 1999. The conference was sponsored by Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE), The United States - Mexico Foundation for Science (FUMEC) and the "Red de Desarrollo e Investigación en Informática" of CONACyT (REDII). For the conference, 27 papers from authors coming from 12 different countries were accepted and published in the Proceedings of the PCS'99. The most promising 12 submissions were proposed for publication in the Special Issue of the Iberoamerican Journal of Research "Computing and Systems" (Revista Iberoamericana de Investigación "Computación y Sistemas") in December of 1999, each of which was reviewed by at least two anonymous referees. Following the reviews, 7 papers from Austria, Germany, Mexico, Poland, Russia, Taiwan, and USA were selected for the publication in this special issue.

Parallel computing systems have the potential of increasing their power to a new and yet unprecedented level. At the same time, there are many applications with increasing computational demands such as large science and engineering simulation problems, database systems, multimedia applications, and grand challenge problems. The road to reach this high performance level, however, is covered by many obstructions that have their origin in a broad spectrum of problem areas of parallel and distributed processing, including parallel and distributed models and architectures, interconnection networks, operating systems, scheduling in parallel systems, languages and algorithms for high-performance computing. The contributions of this special issue cover the following areas of the field: network topologies, scheduling, parallel computations, and applications.

The first two papers discuss special problems of network topologies. The paper by O. G. Monakhov and E. A. Monakhova proposes and analyzes a new topology for multimodule supercomputer systems with respect to communication delays, reliability and connectivity. The paper by W. T. Huang, Y. C.Chuang, J. M. Tan and L. H. Hsu discusses connectivity questions in Möbius Cubes, a variation of hypercube structures, under the assumption of faulty nodes and connections.

The next two papers are devoted to scheduling in parallel or distributed systems. A. W. Krings and M. H. Azadmanesh address run-time issues in multiprocessor real-time systems. A special hybrid scheduling model is presented that introduces limited preemptions, by allowing tasks to be preempted only at certain preemption points. This model for hard real-time applications is sensitive to task response times and avoids the known drawbacks of the priority-based scheduling paradigm. The paper by J. Blazewicz, M. Machowiak, G. Mounie, D. Trystram, J. Weglarz considers the scheduling of very large applications on parallel computing systems, where the application is modeled as malleable tasks, i.e. tasks whose processing times depend on the number of processors granted.

There are two papers that deal with parallel computation. The first is one, by A. Tchernykh, A. Stepanov, A. Rodríguez, and I. Scherson, presents an abstract network machine (ANM) for parallel computation which uses associative networks for representing both fully complete and incomplete program-like and data-like information. The ANM is able to perform partial evaluation when the given information is incomplete, and automatically synthesizes a «residual» parallel program. The paper by K. Stockinger, E. Schikuta, T. Fuerle and H. Wanek specializes on the organization of parallel disk accesses in high performance computation applications. They introduce the Vienna Parallel Input Output System, a client server based system, designed to speed up the disk access for high performance parallel programs by combining characteristics of parallel I/O runtime libraries and parallel file systems with the objective to reach a high I/O bandwidth.

The last paper (by Th. Barth, B. Freisleben, M. Grauer, F. Thilo) is application oriented and deals with optimization problems in engineering, based on finite element method solution approaches, in a cluster of workstations.

The accepted papers represent the current state of the art in the area. Editing this issue of the Iberoamerican Journal of Research «Computing and Systems» would not have been possible without the help of the referees from different countries of North and South America and Europe, and we appreciate their careful evaluation of the submitted papers.

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Guest Editors

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