It is a great pleasure to welcome you to the nineteenth annual ACM Symposium on Applied Computing, Special Track on Parallel and Distributed Systems (SAC 2004-PDS) in Nicosia, Cyprus.

The objective of the PDS track is to provide a forum for scientists, engineers and practitioners in academia, industry and research institutes to share technical ideas, experiences and results and to present their latest findings in any aspects of Parallel and Distributed Computing. The topics of the track emphasize the design, architecture and software of parallel and distributed systems with their scientific and engineering applications.

In response to the call for papers, for this special track, we received 21 paper submissions. Keeping the identities of the authors hidden, we sent the papers to external reviewers. For almost every paper, we received at least 3 independent reviews. After this intensive review process, we carefully ranked the papers and selected 7 high quality papers for presentation at this track and publication in the conference proceedings. Unfortunately, many interesting papers could not be included in the program due to the limited number of sessions allocated to each track. The final program covers a wide range of topics of parallel and distributed systems.

The article by Sandor Juhasz and Hassan Charaf titled "Exploiting Fast Ethernet Performance in Multiplatform Cluster Environment" compares application level end-to-end latencies measured under different conditions varying the number of simultaneous connections in cluster systems, processing threads and the types of operating systems. The experiments show that message latencies are overwhelmingly dominated by software overheads, which can be hidden or eliminated by different methods. They conclude that their approach can take advantage of the bandwidth of a Fast Ethernet connection even with smaller message sizes.

The article by Georgios Goumas, Nikolaos Drosinos, Maria Athanasaki, and Nectarios Koziris titled "Automatic Parallel Code Generation for Tiled Nested Loops" presents a complete end-to-end framework for automatically generating message passing parallel code for tiled nested for-loops. The work considers general parallelepiped tiling transformations and general convex iteration spaces. A tool was developed to automatically generate MPI parallel code. The authors conducted several series of experiments, concerning the compilation time of the tool, the efficiency of the generated code and the
speedup attained on a cluster of PCs. The experimental results show the merit of general parallelepiped tiling transformations and verify previous theoretical work on scheduling-optimal tile shapes.

The article by Victoria Ungureanu, Benjamin Melamedy, Phillip G. Bradfordz, and Michael Katehakis titled "Class-Dependent Assignment in Cluster-based Servers" presents an assignment policy for front-end job dispatchers that has good response time performance, and is practical to implement in that the amount of information used by the dispatcher is relatively small, so that the attendant computation and communication overheads are low. The authors propose a policy, called CDA (Class Dependent Assignment), where short jobs are assigned in Round-Robin manner as soon as they arrive, while long jobs are deferred and assigned only when a back-end server becomes idle.

The article by J. Al-Sadi and A.M. Awwad titled "Efficient Fault-Tolerant Routing Algorithm for OTIS-Cube Using Unsafety Vectors" proposes a new fault-tolerant routing algorithm for the well known class of network, OTIS-cube. In this new proposed algorithm, each node starts by computing the first level unsafety set, composed of the set of unreachable direct neighbours. It then performs m-1 exchanges with its neighbours to determine the k-level unsafety sets for all k = 1...m. The paper shows how each node calculates numeric unsafety vectors and uses them to achieve efficient fault-tolerant routing.

The article by Danilo Ardagna, Chiara Francalanci, and Marco Trubian titled "A Cost-Oriented Approach for Infrastructural Design" proposes to represent complex infrastructural design issues as a single cost-minimization problem. The problem is decomposed in four intertwined cost-minimization sub-problems; optimization is accomplished by sequentially solving these sub-problems with a heuristic approach and tuning their solution with a final tabusearch step. Results indicate that decomposition significantly reduces optimization time and solutions are also closer to the global optimum if results are compared to those identified without prior decomposition.

The article by Hakan Sundell and Philippas Tsigas titled "Scalable and Lock-Free Concurrent Dictionaries" presents an efficient and practical lock-free implementation of a concurrent dictionary that is suitable for both fully concurrent (large multi-processor) systems as well as pre-emptive (multi-process) systems. The algorithm is based on the randomized sequential list structure called Skiplist, and implements the full set of operations on a dictionary that is suitable for practical settings. The experimental results show that the algorithm outperforms the other lock-free algorithm for dictionaries with realistic sizes, both on fully concurrent as well as pre-emptive systems.

The article by J. P. Caldeira, F. Melicio, and A. Rosa titled "Using a Hybrid Evolutionary-Taboo Algorithm to solve Job Shop Problem" proposes a new hybrid algorithm to solve the Job Shop Problem. The proposed algorithm, called Evolutionary-Taboo, uses an Evolutionary Algorithm (EA) to enhance results obtained by one of the best Taboo algorithms for this problem. The algorithm was tested on the benchmark problems for which the taboo algorithm returned its worst results. On average, the taboo results were improved by 2.9%. The results were under one percent from the best known results for these problems.

We would like to thank all the authors for submitting their papers to SAC 2004-PDS. We would also like to thank the many external reviewers for their time and hard work in finishing the review process in less than four weeks. Our special thanks go to Kornilios Kourtis who designed and managed the SAC 2003-PDS website as well as the paper review system. Finally, we would like to thank the General Program Chairs Andrea Omicini and Roger Wainwright for their help and guidance throughout the preparation of this track.