

Lecture Notes in Computer Science

Edited by G. Goos and J. Hartmanis

111

CONPAR 81

Conference on Analysing Problem Classes
and Programming for Parallel Computing
Nürnberg, June 1981
Proceedings

Edited by Wolfgang Händler



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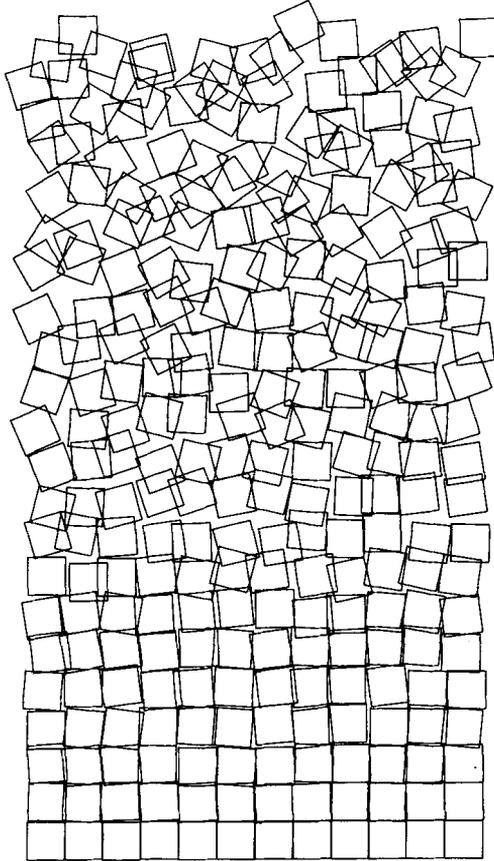
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CONPAR 81



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P R E F A C E

Wolfgang Händler
General Chairman

In its title this conference differs from some similar events dealing with parallelism in computer systems and with distributed computing. Such conferences discuss structures which are proposed for the solution of problems by the computation of particular algorithms, but are only useful for these problems. Some more sophisticated structures are useful in broader classes. Finally there are good reasons to expect in the future <Adaptable Architectures> [1, 2].

Nevertheless there is a lack in knowledge about the very nature of algorithms, their partitionability in principle into parallel constituents and about the way in which such algorithms can be dealt with, e. g. by <divide and conquer> methods. An interesting hint was given by C. R. Vick [3]:

I've always felt that the challenge to map an inherently parallel problem space into a parallel solution space with as few artificial transformations as possible represents one of the most interesting challenges ... (1978).

The German pioneer in computing, Konrad Zuse [4], developed similar ideas (1969). He argues that the contemporary procedure is very often a roundabout way. For example one endeavours to transform an ultimately discrete problem into an analytic, i. e. continuous, approach and to discretize it again for solving it by a (digital) computer. He recommends a direct procedure using what he calls a <Computing Space>.

It seems to be a worthwhile goal for CONPAR 81, to investigate general methods, examples, or case studies, which center on the problem, how parallel algorithms (as a general term) can be implemented and utilized for higher throughput, speed, and fault-tolerant computing. In such a way the Program Committee and the staff of IMMD interpreted the commission from the "Gesellschaft für Informatik" to organise CONPAR 81.

The responsibility of the Program Committee turned out to be not an easy one. In accordance with the decision of the committee not to admit 'parallel sessions' during the conference, we had to select 29 papers from a total of 80 submitted papers. Despite the good quality of some papers we had to reject them because they did not fit the declared aim of CONPAR 81.

We succeeded in getting contributions from distinguished experts in the field, accordingly announced as 'invited speakers'. In this context I welcome in particular our outstanding keynote speaker, Prof. Arthur W. Burks, who directed our attention at an early point of time to the activities of the late John von Neumann [5] concerning cellular automata and also 'growing' automata. Being one of the best known pioneers of the computer scene, A. Burks is at the same time a distinguished philosopher, which made it particularly valuable to receive his contribution.

Originally we planned to hold the conference at the Campus Erlangen-South of the University Erlangen-Nürnberg, where activities in parallelism are located. Unfortunately another conference with the same date in the city of Erlangen prevented this.

Nevertheless Nuremberg (Nürnberg) is an excellent alternative which offers a great spectrum of other opportunities, and we hope that the participants enjoy the medieval and stimulating atmosphere around the conference site.

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TABLE OF CONTENTS

KEYNOTE SPEAKER

<i>Arthur W. Burks</i>	1
Programming and structure changes in parallel computers	

SESSION 1, MATCHING THE STRUCTURE OF COMPUTATIONS AND MACHINE ARCHITECTURE

<i>F.J. Peters</i>	25
Tree machines and divide-and-conquer algorithms	
<i>M. Feller, M.D. Ercegovic</i>	37
Queue machines: an organization for parallel computation	
<i>D.A. Podsiadlo, H.F. Jordan</i>	48
Operating systems support for the finite element machine	
<i>D.J. Kuck, invited speaker</i>	66
Automatic program restructuring for high-speed computation	

SESSION 2, PROGRAMMING LANGUAGES WHICH SUPPORT PARALLELISM

<i>G. Dávid, I. Losonczy, S.D. Papp</i>	85
Language support for designing multilevel computer systems	
<i>J.P. Banatre, M. Banatre</i>	101
Parallel structures for vector processing	
<i>R.H. Perrott</i>	115
Language design approaches for parallel processors	
<i>A.H. Veen</i>	127
Reconciling data flow machines and conventional languages	
<i>M. Broy</i>	141
On language constructs for concurrent programs	
<i>J.R. Gurd, J.R.W. Glauert, C.C. Kirkham</i>	155
Generation of dataflow graphical object code for the Lapse programming language	
<i>T. Legendi, invited speaker</i>	169
Cellular algorithms and their verification	
SESSION 3, CELLULAR ALGORITHMS AND THEIR VERIFICATIONS	
<i>J. Pecht</i>	189
The development of fast cellular pattern transformation algorithms using virtual boundaries	

<i>E. Katona</i>	203
Cellular algorithms for binary matrix operations	
SESSION 4, SYSTEMATIC DESIGN, DEVELOPMENT, AND VERIFICATION OF PARALLEL ALGORITHMS	
<i>J. Staunstrup</i>	217
Analysis of concurrent algorithms	
<i>P. Lecouffe</i>	231
SAUGE: How to use the parallelism of sequential programs	
<i>A. Pettorossi</i>	245
A transformational approach for developing parallel programs	
<i>Ch. Lengauer, E.C.R. Hehner</i>	259
A methodology for programming with concurrency	
<i>K. Ramamritham, R.M. Keller</i>	271
On synchronization and its specification	
<i>P.M. Flanders, invited speaker</i>	283
Non-numerical aspects of computations on parallel hardware	
SESSION 5, NONNUMERICAL PARALLEL ALGORITHMS	
<i>S.R. House</i>	298
Compiling in parallel	
<i>V. Shiloach, U. Vishkin</i>	314
Finding the maximum, merging and sorting in a parallel computation model	
<i>G. Salton, D. Bergmark</i>	328
Parallel computations in information retrieval	
<i>D.D. Gajski</i>	343
Recurrence semigroups and their relation to data storage in fast recurrence solvers on parallel machines	
<i>D. Nath, S.N. Maheshwari, P.C.P. Bhatt</i>	358
Parallel algorithms for the convex hull problem in two dimensions	
<i>U. Schendel, invited speaker</i>	373
On basic concepts in parallel numerical mathematics	
<i>V. Saad and A.H. Sameh, invited speaker</i>	395
Iterative methods for the solution of elliptic difference equations on multiprocessors	

SESSION 6, PARALLELISM OF NUMERICAL ALGORITHMS

PART I

N.K. Kasabov, G.T. Bijevo, B.J. Jechev 414
 Hierarchical discrete systems and realisation of parallel algorithms

M. Vajteršić 423
 Solving two modified discrete poisson equations in $7 \log n$ steps on n^2 processors

L. Halada 433
 A parallel algorithm for solving band systems and matrix inversion

F. Hossfeld, P. Weidner 441
 Parallel evaluation of correlation time-of-flight experiments

PART II

G. Fritsch, H. Müller 453
 Parallelization of a minimization problem for multiprocessor systems

J. Julliard, G.R. Perrin 464
 Design and development of concurrent programs

E. Dekel, S. Sahni 480
 Binary trees and parallel scheduling algorithms

J. Shanehchi, D.J. Evans 493
 New variants of the quadrant interlocking factorisation (Q.I.F.) method

EXPRESSION OF THANKS 508