Languages and Compilers for Parallel Computing

11th International Workshop, LCPC'98, Chapel Hill, NC, USA, August 7-9, 1998, Proceedings

Bearbeitet von
Siddharta Chatterjee, Jan F Prins, Larry Carter, Jeanne Ferrante, Zhiyuan L Li, David Sehr, Pen-Chung Yew

ISBN 978 3 540 66426 0
Format (B x L): 15,5 x 23,5 cm
Gewicht: 1250 g
Table of Contents

Java

From Flop to MegaFlops: Java for Technical Computing ....................... 1
J. E. Moreira, S. P. Midkiff and M. Gupta
(IBM T.J. Watson Research Center)

Considerations in HPJava Language Design and Implementation ........ 18
Guansong Zhang, Bryan Carpenter, Geoffrey Fox, Xinying Li
and Yukong Wen (Syracuse University)

Locality

A Loop Transformation Algorithm Based on Explicit Data Layout
Representation for Optimizing Locality ........................................ 34
M. Kandemir (Northwestern University), J. Ramanujam (Louisiana
State University), A. Choudhary (Northwestern University) and
P. Banerjee (Northwestern University)

An Integrated Framework for Compiler-Directed Cache Coherence
and Data Prefetching .............................................................. 51
Hock-Beng Lim (University of Illinois) and Pen-Chung Yew
(University of Minnesota)

I/O Granularity Transformations ............................................. 68
Gagan Agrawal (University of Delaware)

Network Computing

Stampede: A Programming System for Emerging Scalable
Interactive Multimedia Applications ............................................... 83
Rishiyur S. Nikhil (Compaq), Umakishore Ramachandran (Georgia Tech),
James M. Rehg (Compaq), Robert H. Halstead, Jr. (Curl Corporation),
Christopher F. Joerg (Compaq) and Leonidas Kontothanassis (Compaq)

Network-Aware Parallel Computing with Remos .......................... 100
Bruce Lowekamp, Nancy Miller, Dean Sutherland, Thomas Gross,
Peter Steenkiste and Jaspal Subhlok (Carnegie Mellon University)

Object-Oriented Implementation of Data-Parallelism on
Global Networks ........................................................................ 120
Jan Borowiec (GMD FIRST)

Fortran

Optimized Execution of Fortran 90 Array Language on
Symmetric Shared-Memory Multiprocessors ................................. 131
Vivek Sarkar (IBM T.J. Watson Research Center)
Fortran RED — A Retargetable Environment for
Automatic Data Layout .................................................. 148
Ulrich Kremer (Rutgers University)

Automatic Parallelization of C by Means of Language Transcription ...... 166
Richard L. Kennell and Rudolf Eigenmann (Purdue University)

Irregular Applications
Improving Compiler and Run-Time Support for Irregular
Reductions Using Local Writes ........................................... 181
Hwansoo Han and Chau-Wen Tseng (University of Maryland)

Beyond Arrays — A Container-Centric Approach for
Parallelization of Real-World Symbolic Applications ................... 197
Peng Wu and David Padua (University of Illinois)

SIPR: A New Framework for Generating Efficient Code for
Sparse Matrix Computations ............................................. 213
William Pugh and Tatiana Shpeisman (University of Maryland)

HPF-2 Support for Dynamic Sparse Computations .................... 230
R. Asenjo (University of Málaga), O. Plata (University of Málaga),
J. Touriño (University of La Coruña), R. Doallo (University of La Coruña)
and E.L. Zapata (University of Málaga)

Instruction Scheduling
Integrated Instruction Scheduling and Register Allocation Techniques ...... 247
David A. Berson (Intel Corporation), Rajiv Gupta (University of
Pittsburgh) and Mary Lou Soffa (University of Pittsburgh)

A Spill Code Placement Framework for Code Scheduling ............... 263
Dingchao Li, Yuji Iwahori, Tatsuya Hayashi and Naohiro Ishii
(Nagoya Institute of Technology)

Copy Elimination for Parallelizing Compilers ................................ 275
David J. Kolson, Alexandru Nicolau and Nikil Dutt
(University of California, Irvine)

Potpourri
Compiling for SIMD Within a Register ..................................... 290
Randall J. Fisher and Henry G. Dietz (Purdue University)

Automatic Analysis of Loops to Exploit Operator Parallelism on
Reconfigurable Systems .................................................. 305
Narasimhan Ramasubramanian, Ram Subramanian
and Santosh Pande (University of Cincinnati)

Principles of Speculative Run–Time Parallelization ....................... 323
Devang Patel and Lawrence Rauchwerger (Texas A&M University)
# Table of Contents

## Dependence Analysis

The Advantages of Instance-Wise Reaching Definition Analyses in Array $(S)SA$ ........................................................... 338  
*Jean-François Collard* (University of Versailles)

Dependency Analysis of Recursive Data Structures Using Automatic Groups .................................................. 353  
*D. K. Arvind and T. A. Lewis* (The University of Edinburgh)

The I+ Test .............................................................. 367  
*Weng-Long Chang and Chih-Ping Chu*  
(National Cheng Kung University)

Author Index ............................................................. 383