TABLE OF CONTENTS

Preface v

Programme Committee vii

List of Referees viii

Part I - High-Performance Architectures

EM-C: Programming with Explicit Parallelism and Locality for EM-4 Multiprocessor
Mitsuhisa Sato, Yuetsu Kodama, Shuichi Sakai and Yoshinori Yamaguchi 3

A Fine-Grain Threaded Abstract Machine
Jesper Vasell 15

Tradeoffs in the Design of Single Chip Multiprocessors
David H. Albonesi and Israel Koren 25

Part II - Code Generation for Multithreaded and Dataflow Architectures

An Evaluation of Optimized Threaded Code Generation
Lucas Roh, Walid A. Najjar, Bhanu Shankar, and A.P. Wim Böhm 37

Functional I-structure, and M-structure Implementations of NAS Benchmark FT
S. Sur and W. Böhm 47

The Plan-Do Style Compilation Technique for Eager Data Transfer in Thread-Based Execution
M. Yasugi, S. Matsuoka, and A. Yonezawa 57

Part III - Memory and Cache Issues

A Compiler-Assisted Scheme for Adaptive Cache Coherence Enforcement
Trung N. Nguyen, Farnaz Mounes-Toussi, David J. Lilja, and Zhiyuan Li 69

The Impact of Cache Coherence Protocols on Systems using Fine-Grain Data Synchronization
David B. Glasco, Bruce A.Delagi, and Michael J. Flynn 79

Towards a Programming Environment for a Computer with Intelligent Memory
Abhaya Asthana, Mark Cravatts, and Paul Krzyzanowski 89

Part IV - Distributed Memory Machines

Communication Analysis for Multicomputer Compilers
Inkyu Kim and Michael Wolfe 101

Automatic Data Layout Using 0-1 Integer Programming
Robert Bixby, Ken Kennedy, and Ulrich Kremer 111

Processor Tagged Descriptors: A Data Structure for Compiling for Distributed-Memory Multicomputers
Ernesto Su, Daniel J. Palermo, and Prithviraj Banerjee 123

Part V - Multi-Level Parallelism

Resource Spackling: A Framework for Integrating Register Allocation in Local and Global Schedulers
David A. Berson, Rajiv Gupta, and Mary Lou Soffa 135

An Approach to Combine Predicated/Speculative Execution for Programs with Unpredictable Branches
Mantipragada Srinivas, Alexandru Nicolau, and Vicki H. Allan 147

A PDG-based Tool and its Use in Analyzing Program Control Dependences
Chris J. Newburn, Derek B. Noonburg, and John P. Shen 157

Part VI - Compiling for Parallel Machines

Static Analysis of Barrier Synchronization in Explicitly Parallel Programs
Tor E. Jeremiassen and Susan J. Eggers 171

Exploiting the Parallelism Exposed by Partial Evaluation
R. Surati and A. A. Berlin 181

Effects of Loop Fusion and Statement Migration on the Speedup of Vector Multiprocessors
Mayez Al-Mouhamed and Lubomir Bic 193

Part VII - Logic Languages

Practical Static Mode Analyses of Concurrent Logic Languages
E. Tick 205

Demand-Driven Dataflow for Concurrent Committed-Choice Code
Bart Massey and Evan Tick 215

Exploitation of Fine-grain Parallelism in Logic Languages on Massively Parallel Architectures
Hiecheol Kim and Jean-Luc Gaudiot 225

Part VIII - Application Specific Architectures

From SIGNAL to fine-grain parallel implementations
Olivier Maffeis and Paul Le Guernic 237

Microcode Generation for Flexible Parallel Target Architectures
Rainer Leupers, Wolfgang Schenk, and Peter Marwedel 247

A Fleng Compiler for PIE64
Hidemoto Nakada, Takuya Araki, Hanpei Koike, and Hidehiko Tanaka 257

Part IX - Functional Languages, Dataflow Models and Implementation

Compiling Higher-Order Functions for Tagged-Dataflow
P. Rondogiannis and W.W. Wadge 269

Dataflow-Based Lenient Implementation of a Functional Language, Valid, on Conventional Multi-processors
Shigeru Kusakabe, Eiichi Takahashi, Rin-ichiro Taniguchi, and Makoto Amamiya 279

Dataflow and Logicflow Models for Defining a Parallel Prolog Abstract Machine
P. Kacsuk 289

Towards a Computational Model for UFO
John Sargeant, Chris Kirkham, and Steve Anderson 299

Part X - Short Papers

Software pipelining: A Genetic Algorithm Approach
V.H. Allan and M.R. O'Neill 311

Parallel Compilation on Associative Computers
Chandra R. Asthagiri and Jerry L. Potter 315

Partitioning of Variables for Multiple-Register-File Architectures via Hypergraph Coloring
A. Capitanio, N. Dutt and A. Nicolau 319

Realizing Parallel Reduction Operations in Sisal 1.2
Scott M. Denton, John T. Feo and Patrick J. Miller 323

An Introduction to Simplex Scheduling
Benoît Dupont de Dinechin 327

Speculative Evaluation for Parallel Graph Reduction
James S. Mattson Jr. and William G. Griswoldd 331

Toward a General-Purpose Multi-Stream System
Avi Mendelson and Bilha Mendelson 335

Representing Control Flow Behaviour of Programs
Cyril Meurillon and Ciaran O'Donnell 339

Transformations on Doubly Nested Loops
Ron Sass and Matt Mutka 343

A Comparative Study of Data-Flow Architectures
David F. Snelling and Gregory K. Egan 347

Progress Report on Porting Sisal to the EM-4 Multiprocessor
Andrew Sohn, Lingmian Kong and Mistuhisa Sato 351

Static vs. Dynamic Strategies for Fine-Grain Dataflow Synchronization
Jonas Vasell 355

Trace Software Pipelining: A Novel Technique for Parallelization of Loops with Branches
Jian Wang, Andreas Krall, M. Anton Ertl and Christine Eisenbeis 359