

Society for Industrial and Applied Mathematics

Preliminary Program

FIFTH SIAM CONFERENCE ON
PARALLEL PROCESSING
FOR • SCIENTIFIC • COMPUTING

March 25-27, 1991
Westin Galleria and Westin Oaks Hotels
Houston, Texas

Tutorial on Programming Support
Environments for Parallel Computer Systems
March 24, 1991

Conference Themes

Parallel Numerical Algorithms

*Mathematical Software for High
Performance Computing*

Computer Performance Evaluation

Scientific Programming Languages

Programming Environments

Distributed Computing

Massively Parallel Processing

Sponsored by SIAM Activity Group on Supercomputing

SIAM.

CONTENTS

Tutorial	Cover 2
Get-Togethers	Cover 2
Program Overview	1
Program-At-A-Glance	2-3
Conference Program	4-10
Exhibit Information	10
Upcoming Conferences	10
Transportation Information	11
Hotel Information	11
Registration Information	12
Registration Forms:	
Conference and Hotel	Cover 3

DEADLINE DATES

Hotel Reservations

March 8, 1991

Advance Conference Registration

March 18, 1991

PROCEEDINGS

The proceedings will be published in early 1992. A copy is included in your registration fee and will be sent to you upon publication.

ORGANIZING COMMITTEE

Danny C. Sorensen, Chair
Department of Mathematical Sciences
Rice University

Jack J. Dongarra
Department of Computer Science
University of Tennessee, Knoxville and
Oak Ridge National Laboratory

Ken Kennedy
Department of Computer Science
Rice University

Paul Messina
Department of Applied Mathematics
California Institute of Technology

Robert G. Voigt
ICASE

FUNDING AGENCY

SIAM is conducting this conference with the partial support of the National Science Foundation and the Department of Energy.

TUTORIAL

Programming Support Environments for Parallel Computer Systems

Sunday, March 24, 1991

Westin Galleria and Westin Oaks Hotels
Houston, Texas

Organizer and Instructor:

Ken Kennedy, Department of Computer Science,
Rice University

This tutorial will survey current work on programming support environments for parallel scientific computers. Six central topics will be addressed.

- **Program development tools.** In this category are systems that support the preparation of parallel programs according to a specific paradigm.
 - **Program understanding tools.** The analysis used to support automatic parallelization can be supplied to help the programmer understand the data relationships in a parallel program that might lead to errors. As an example, the ParaScope Editor, a tool that helps the user review the potential race conditions in a program will be discussed.
 - **Compilation tools.** New compiler systems that hide the details of the target machine's memory hierarchy will be discussed.
 - **Whole-program analysis systems.** Compilation systems that compile and optimize the whole program will be needed to support compilation for parallelism. The philosophy of and experience with the ParaScope system at Rice University will be examined.
 - **Parallel debugging tools.** Here the talk will focus on the problem of finding schedule-dependent errors. Dynamic, static and hybrid schemes will be discussed.
 - **Performance tuning tools.** The principal strategy to be discussed here is performance visualization, in which the system uses pictures to present an abstract view of some aspect of program performance. The basic strategy will be described and examples in working systems cited.
- The tutorial will conclude with a discussion of future research directions.

GET-TOGETHERS

SIAM Welcoming Reception

Sunday, March 24, 1991 7:00 pm - 9:00 pm
Plaza #1

Cash Bar - assorted mini hors d'oeuvres

At Poster Session 1

Monday, March 25, 1991 5:30 pm - 7:00 pm
Woodway II

Come and join your colleagues to participate in the exchange of ideas with the presenters and others who have interest in their work. During the session, complimentary beer, chips and dips will be served.

Poster presenters will be able to set up their display materials starting at 12:00 noon in the Woodway II room.

At Poster Session 2

Tuesday, March 26, 1991 5:30 pm - 7:00 pm
Woodway II

Once again you are invited to join your colleagues to participate in the exchange of ideas generated by the poster presentations.

There will be a cash bar during the session. Chips and dips will be available.

Program

(Sunday afternoon, March 24, 1991)

2:00	Introduction to Parallelization
2:45	Parallel Programming Environment Overview
3:00	Program Development and Understanding Tools
3:30	Coffee
4:00	Compilation of Parallelism
4:45	Parallel Debugging and Performance Tuning
5:30	Tutorial Adjourns

Tutorial Registration Fees*

	SIAM Member	Non- Member	Student
Advance	\$115	\$135	\$55
On-Site	\$135	\$155	\$75

*Registration fee for the tutorial includes preprints, coffee and lunch. Lunch will precede the tutorial at 12:00 noon. Please complete the registration card found on the inside back cover of this program.

Attendees should preregister for the tutorial since on-site registration cannot be guaranteed. Preprints of the lecture materials will be distributed upon check-in at the registration desk.

Tutorial will be located at Galleria I. Luncheon will be at Galleria II.

PROGRAM OVERVIEW

Following are subject classifications of titles of invited presentations, 30-minute and 20-minute presentations and special sessions. Codes in parentheses designate session numbers for invited (IP), selected 30-minute (SP), contributed 20-minute (CP), and special sessions (SS) presentations. Titles are not given for contributed presentations and special sessions.

Sparse Linear Algebra

Sparse Orthogonal Factorization on a Distributed Memory Multiprocessor (SP1)
On the Performance of a Parallel Technique for Solving Large Sparse Linear Systems (SP7)
A Unified Computational Model for the Parallel Solution of General Sparse Non-Symmetric Linear Systems on Shared-Memory Multiprocessors (SP15)

Automatic Blocking

Automatic Blocking by a Compiler (SP2)
CP31

Partial Differential Equations

The Scalability of Numerical Methods for Parallel Climate Modeling (SP3)
Parallel Implementation of a Control Volume Method for Solving Partial Differential Equations on the Sphere (SP6)
A MIMD Implementation of a Parallel Euler Solver for Unstructured Grids (SP9)
CFD Equations Solution on Massively Parallel Computers (SP12)
CP3, CP8, CP13, CP18

Iterative Linear Algebra

Block Lanczos Techniques for Accelerating the Block Cimmino Method (SP4)
CP9, CP19

Dynamic Load Balancing

Parallelizing Dynamic Processes on Message Passing Architectures (SP5)
CP20

Computational Biology

Computational Challenges in Modern Biology (IP1)
CP1

SIMD Data Management

Expression Evaluation in Data Parallel Architecture (SP8)

Multilevel Methods

Greatly Simplified Theory for Parallel Multilevel Methods (SP10)

Visual Programming

Examples in Phred (SP11)
Visualization in Parallel Computational Mechanics Research (IP4)

Performance Analysis

A Comparison of Parallel Architectures (SP13)
CP34
A Novel Performance Model for Asynchronous Parallel Processing (SP19)
Performance Analysis of a 24 Code Sample on Cray X/Y-MP Systems at the Ohio Supercomputer Center (SP22)

Compilation/Unstructured Grids

Support for Parallel Unstructured Scientific Computations (SP14)

Multigrid

An Optimal Parallel Time Multigrid Algorithm (SP16)

Fast Fourier Transforms

The Fractional Fourier Transform and Applications (SP17)
CP16

Eigenvalues

An Efficient Parallel Homotopy Algorithm for Unsymmetric Eigenproblems with $O(n)$ Running Time (SP18)
CP4

Linear Algebra

Orthogonal Factorizations in LAPACK (SP20)
CP2, CP14, CP19

Compilation/Distributed Memory

Runtime Compilation for Distributed Memory Multicomputers (SP21)

Optimization

Direct Search Methods on Parallel Machines (SP23)
CP12, CP17

Portable Programming

Algorithmic Aspects of Domain Decomposition Method (IP6)

Parallelism and Mathematical Modeling

Physical Analogies in Computation (IP3)
Cellular Automata and Classical Numerical Methods: Two Sides of the Same Coin (IP5)

Architectures

Design of High Performance Computer Architectures (IP2)
CP6

Programming Tools

CP5

Visualization

Scientific Visualization in Parallel Mechanics (IP4)

Semi-Conductor Device Modeling

CP7

Heterogeneous Network Processing

CP10

Memory Access

CP11

Cellular Automata

CP15

Software

CP35

Reservoir Simulation

Large-Scale Modeling in Petroleum Reservoir Engineering and Seismic Problems (SS1-SS4)

ICIAM 91



Washington, D.C., USA
July 8-12, 1991

Second International
Conference on Industrial
and Applied Mathematics

ICIAM Update

- More than 2800 applied and computational mathematicians, engineers, and scientists worldwide have already sent in abstracts and minisymposium proposals.
- More than 35% of the respondents are from outside the U.S.A.
- More than 100 representatives throughout the world are distributing ICIAM 91 materials.
- Proposals and abstracts encompass exciting, recent advances in applied and computational mathematics.

Sponsoring Societies

- CAMS/SCMA • ECMI • GAMM
- IMA • SIAM • SIMAI • SMAI
- With the cooperation of INRIA
- Hosted by SIAM

Invited Minisymposium Topics (partial listing)

Mathematics in Technology, Manufacturing, and Design • Semiconductor Modeling • Inverse Methods and Applications to Geophysics, Medicine, and Non-Destructive Testing • Computer-Aided Geometric Design • Interface Phenomena • Mathematical Biology • Atmospheric and Climate Modeling • Algorithms and Software for Mathematical Computation and Graphics • Parallel Processing in Scientific Computation • Computer Science, Discrete Methods, and Complexity • Wavelets • Computational Fluid Dynamics • Computational Mechanical Systems

To obtain complete program and registration materials, as well as other information about the conference and Washington, D.C. area, please contact:

SIAM
3600 University City Science Center
Philadelphia, PA 19104-2688 U.S.A.
Phone: 215-382-9800
Fax: 215-386-7999
E-mail: iciam@wharton.upenn.edu

PROGRAM-AT-A-GLANCE

MONDAY, MARCH 25

	Session Number	Room	Title/Author
7:30		Galleria Foyer I-IV	Registration for Conference Opens
8:45		Galleria I-II	Welcoming Remarks: Danny C. Sorensen
9:00	IP1	Galleria I-II	Computational Challenges in Modern Biology Leroy Hood
10:00	Concurrent Sessions (Selected)		
	SP1	Tanglewood	Sparse Orthogonal Factorization on a Distributed Memory Multiprocessor Padma Raghavan
	SP2	Bellaire	Automatic Blocking by a Compiler Monica S. Lam
	SP3	Post Oak	The Scalability of Numerical Methods for Parallel Climate Modeling William Gropp
10:30	Coffee		
11:00	Concurrent Sessions (Contributed)		
	CP1	Tanglewood	Computational Biology
	CP2	Bellaire	Semiconductor Device Modeling
	CP3	Post Oak	Partial Differential Equations 1
	CP4	Galleria III	Eigenvalue Problems
	CP5	Plaza I	Programming Tools
12:00	Lunch		
1:30	IP2	Galleria I-II	Design of High Performance Computer Architectures John L. Hennessey
2:30	Concurrent Sessions (Selected)		
	SP4	Tanglewood	Block Lanczos Techniques for Accelerating the Block Cimmino Method Iain S. Duff
	SP5	Bellaire	Parallelizing Dynamic Processes on Message Passing Architectures Reinhard V. Hanxleden
	SP6	Post Oak	Parallel Implementation of a Control Volume Method for Solving Partial Differential Equations on the Sphere I-Liang Chern
3:00	Coffee		
3:30	Concurrent Sessions (Selected)		
	SP7	Tanglewood	On the Performance of a Parallel Technique for Solving Large Sparse Linear Systems Gita Alaghband
	SP8	Bellaire	Expression Evaluation in Data Parallel Architectures Robert Schreiber
	SP9	Post Oak	A MIMD Implementation of a Parallel Euler Solver for Unstructured Grids Horst D. Simon
4:10	Concurrent Sessions (Contributed)		
	CP6	Tanglewood	Novel Architectures
	CP7	Bellaire	Nonlinear Equations
	CP8	Post Oak	Partial Differential Equations 2
	CP9	Galleria III	Iterative Linear Algebra 1
	CP10	Plaza III	Heterogeneous Network Processing
5:30		Woodway II	Poster Session I

8:00
8:15
8:30
9:30
10:00
10:30
11:00
12:00
1:30
2:30
3:00
3:30
4:10
5:30

TUESDAY, MARCH 26

Session Number	Room	Title/Author
Galleria Foyer I-IV Registration Desk Opens		
IP3	Galleria I-II	Physical Analogies in Computation Geoffrey C. Fox
IP4	Galleria I-II	Visualization in Parallel Computational Mechanics Research Charbel Farhat
Coffee		
Concurrent Sessions (Selected)		
SP10	Tanglewood	Greatly Simplified Theory for Parallel Multilevel Methods Craig C. Douglas
	Tanglewood	Mapping Implicit Spectral Methods to Scalable Memory Andrea L. Overman
SP11	Bellaire	Examples in Phred Adam Beguelin
	Bellaire	An Experimental Study of the Effectiveness of High Level Parallel Programming J. C. Browne
SP12	Post Oak	CFD Equations Solution on Massively Parallel Computers G. De Pietro
		Explicit/Implicit Domain Decomposition Procedures for Time-Dependent Problems Clint Dawson
Lunch		
IP5	Galleria I-II	Cellular Automata and Classical Numerical Methods: Two Sides of the Same Coin C. David Levermore
Concurrent Sessions (Selected)		
SP13	Tanglewood	A Comparison of Parallel Architectures Oliver McBryan
SP14	Bellaire	Support for Parallel Unstructured Scientific Computations Piyush Mehrotra
SP15	Post Oak	A Unified Computational Model for the Parallel Solution of General Sparse Nonsymmetric Linear Systems on Shared-Memory Multi- processors Gung-Chung Yang
Coffee		
Concurrent Sessions (Selected)		
SP16	Tanglewood	An Optimal Parallel Time Multigrid Algorithm John Van Rosendale
SP17	Bellaire	The Fractional Fourier Transform and Applications David H. Bailey
SP18	Post Oak	An Efficient Parallel Homotopy Algorithm for Unsymmetric Eigenproblems with $O(n)$ Running Time Zhonggang Zeng
Concurrent Sessions (Contributed)		
CP11	Tanglewood	Memory Access
CP12	Bellaire	Optimization 1
CP13	Post Oak	Partial Differential Equations 3
CP14	Galleria II	Linear Algebra 1
CP15	Plaza I	Cellular Automata
Woodway II Poster Session 2		

WEDNESDAY, MARCH 27

Session Number	Room	Title/Author
Galleria Foyer I-IV Registration Desk Opens		
Closing Remarks		
IP6	Galleria I-II	Algorithmic Aspects of Domain Decomposition and Fictitious Domain Methods Roland Glowinski
Concurrent Sessions (Selected and Special Session)		
SP19	Tanglewood	A Novel Performance Model for Asynchronous Parallel Processing Ken Miura
SP20	Bellaire	Orthogonal Factorizations in LAPACK Christian H. Bischof
SP21	Post Oak	Runtime Compilation for Distributed Memory Multicomputers Joel Saltz
SS1	Galleria I-II	Reservoir Simulation on Distributed Memory Parallel Processors John Killough
Coffee		
Concurrent Sessions (Selected and Special Session)		
SP22	Tanglewood	Performance Analysis of a 24 Code Sample on Cray X/Y-MP Systems at the Ohio Supercomputer Center George Delic
SP23	Bellaire	Direct Search Methods on Parallel Machines Virginia Torczon
SP24	Post Oak	Portable Parallel Programming: Cross Machine Comparisons for SIMPLE Calvin Lin
SS2	Galleria I-II	Practical Considerations for Linear Solvers in Reservoir Simulators on Parallel Machines Alvis McDonald
Concurrent Sessions (Contributed and Special Session)		
CP16	Tanglewood	Fast Fourier Transforms
CP17	Bellaire	Optimization 2
CP18	Post Oak	Partial Differential Equations 4
CP19	Galleria III	Iterative Linear Algebra 2
CP20	Plaza I	Load Balancing
SS3	Galleria I-II	Reservoir Simulation on a Massively Parallel SIMD Computer Jeffrey M. Rutledge
		A New Parallel Iterative Linear Solution Method for Large-Scale Reservoir Simulation John Wallis
Lunch		
IP7	Galleria I-II	The Parallelization of an Oil Reservoir Simulator (tentative) Diederik T. Van Daalen
Coffee		
Concurrent Sessions (Contributed and Special Session)		
CP21	Tanglewood	Block Linear Algebra
CP22	Bellaire	Data and Loop Transformations
CP23	Post Oak	Asynchronous Iteration
CP24	Galleria III	Performance Evaluation
CP25	Plaza I	Software
SS4	Galleria I-II	Large-Scale Computing Problems in Seismic Imaging Irshad R. Mufti
		Application of Cray Vector/Parallel Processors in Enhanced Oil Recovery Simulation Kamy Sepehrmoori
		Multitasking of a Reservoir Simulator on the Cray XMP Gary Li
Conference Adjourns 4:30		

CONFERENCE PROGRAM

MONDAY MORNING, MARCH 25

7:30 /Galleria Foyer I-IV

Registration Desk Opens

8:45 /Galleria I-II

Welcoming Remarks

Danny C. Sorensen, Rice University

9:00 /Galleria I-II

IP1

Computational Challenges in Modern Biology

The computational needs of modern biology are expanding at an exponential rate in several major areas, including: 1) the analysis of linear sequences of proteins and DNA; 2) the analysis of three-dimensional conformation of macromolecules; 3) genetic and physical mapping and linkage analysis; 4) population genetics and evolutionary studies; 5) system modeling, particularly neural systems, and 6) the management and distribution of the exploding volume of molecular, genetic and structural knowledge. It will be imperative to render this information accessible in an integrated manner in the context of powerful analytical tools. Meeting these needs will require expertise in many technical fields, including mathematics and statistics, information theory, image processing and computer hardware and software design.

The essence of biology in the future will be the multiparameter analysis required to understand the complex networks of interactions that are the essence of human development and neural function. A variety of computational methods are being applied to these problems today. Highly parallel methods of computing will greatly facilitate further progress toward solving these problems.

The speaker will discuss the general nature of a variety of different computational problems in biology and some of the approaches to their solutions.

Leroy Hood and **T. Hunkapiller**
Division of Biology
California Institute of Technology

10:00-10:30

Concurrent Sessions (Selected)

SP1 Sparse Linear Algebra

Tanglewood

10:00

Sparse Orthogonal Factorization on a Distributed Memory Multiprocessor

Alex Pothén and Padma Raghavan, Pennsylvania State University

SP2 Automatic Blocking

Bellaire

10:00

Automatic Blocking by a Compiler

Monica S. Lam and Michael E. Wolf, Stanford University

SP3 Partial Differential Equations 1

Post Oak

10:00

The Scalability of Numerical Methods for Parallel Climate Modeling

Ian Foster, William Gropp, and Rick Stevens, Argonne National Laboratory

10:30

Coffee

11:00-12:00

Concurrent Sessions (Contributed)

CP1 Computational Biology

Tanglewood

11:00

Parallel Molecular Dynamics

Terry W. Clark, L. Ridgway Scott, and J. Andrew McCammon, University of Houston

11:20

On Parallel Search of DNA Sequence Databases

Xiaojun Guan, Oak Ridge National Laboratory, University of Tennessee, Knoxville; Edward Uberbacher, Richard Mural, and Reinhold Mann, Oak Ridge National Laboratory

11:40

Simulation of a Cancer Progression in the Colon on a Massively Parallel Processor (CM-2)

Slobodan R. Sipicic, Boston University

CP2 Semiconductor Device Modeling

Bellaire

11:00

Data Parallel Algorithms for the Numerical Modeling of Semiconductor Devices

James P. Darling, The Johns Hopkins University and Isaak D. Mayergoyz, University of Maryland, College Park

11:20

3D MOS Device Simulation on a Connection Machine

Otto Heinrichsberger, Siegfried Selberherr, and Martin Stiftinger, Technical University Vienna, Austria

11:40

Parallel Graph-Embedding Heuristics

John E. Savage, and Markus G. Wloka, Brown University

CP3 Partial Differential Equations 1

Post Oak

11:00

Parallel Computations Using Interface Methods for Fluid Dynamics in Three Dimensions

Yuefan Deng and James Glimm, State University of New York, Stony Brook

11:20

Parallel Ocean Circulation Modeling

L. Rose, K. Gallivan, and E. Gallopoulos, University of Illinois, Urbana and A. Navarra, IMGA-CNR, Italy
University of Colorado, Colorado Springs

11:40

Experiments in Thermal Hydraulics Simulation: Multiprocessing COMMIX

S. Aslam, E. Gallopoulos, and M. Ham, University of Illinois, Urbana; T. Canfield, M. Minkoff, and R. Bloomquist, Argonne National Laboratory

CP4 Eigenvalue Problems

Galleria III

11:00

Parallel Solution of a Generalized Symmetric Eigenvalue Problem

Christopher Beattie and Calvin Ribbens, Virginia Polytechnic Institute and State University

11:20

A Parallel Algorithm for Computing the Eigenvectors of a Nonsymmetric Matrix

G.A. Geist and E.R. Jessup, Oak Ridge National Laboratory

11:40

A Parallel Algorithm for Generalized Eigenvalue Problems

Hong Zhang, Clemson University

CP5 Programming Tools

Plaza I

11:00

Translating Control Parallelism to Data Parallelism

Vasanth Balasundaram, IBM Thomas J. Watson Research Center

11:20

Graphically Based Debugging Tools for the Connection Machine

David Deutsch, Boston University

11:40

Generating Finite Element Programs for Multiprocessors

Naveen Sharma, Kent State University

MONDAY AFTERNOON, MARCH 25

12:00

Lunch

1:30-2:30 /Galleria I-II

IP2

Design of High Performance Computer Architectures

There seems to be widespread agreement that a shared memory model of parallel processing offers advantages that facilitate programming. However, scaling a multiprocessor that supports a shared memory model has a substantial difficulty--the requirement to scale memory bandwidth. This problem can be overcome by physically distributing the memory while maintaining a single shared address space. A directory-based cache coherency protocol can then be used to maintain a consistent view of the memory from all the processors. While such an architecture will support shared-memory parallel programming, substantial challenges for algorithm designers and programmers remain, since it is difficult for the architecture to hide the nonuniformity in access time created by distributing memory.

The speaker will present an overview of the successes and challenges.

John L. Hennessey
Department of Electrical Engineering
Stanford University

2:30-3:00

Concurrent Sessions (Selected)

SP4 Iterative Linear Algebra

Tanglewood

2:30

Block Lanczos Techniques for Accelerating the Block Cimmino Method

M. Arioli, Iain S. Duff, D. Ruiz, and M. Sadkane, Rutherford Appleton Laboratory, United Kingdom

SP5 Dynamic Load Balancing

Bellaire

2:30

Parallelizing Dynamic Processes on Message Passing Architectures

Reinhard V. Hanxleden, Rice University and L. Ridgway Scott, University of Houston

SP6 Partial Differential Equations 2

Post Oak

2:30

Parallel Implementation of a Control Volume Method for Solving PDEs on the Sphere

I-Liang Chern, and Ian Foster, Argonne National Laboratory

CONFERENCE PROGRAM

3:00-3:30
Coffee

3:10-4:00 Concurrent Sessions (Selected)

SP7 Sparse Linear Algebra Tanglewood

3:30
On the Performance of a Parallel Technique for Solving Large Sparse Linear Systems
Gita Alaghband, University of Colorado, Denver

SP8 SIMD Data Management Bellaire

3:30
Expression Evaluation in Data-Parallel Architectures
John R. Gilbert, Xerox Palo Alto Research Center and
Robert Schreiber, NASA Ames Research Center

SP9 Partial Differential Equations 3 Post Oak

3:30
A MIMD Implementation of a Parallel Euler Solver for Unstructured Grids
Timothy J. Barth, NASA Ames Research Center; Zhong C. Lou, University of California, Berkeley; and Horst D. Simon, NASA Ames Research Center

4:10-5:10 Concurrent Sessions (Contributed)

CP6 Novel Architectures Tanglewood

4:10
Design of Compact High Performance Processing Elements for the FCHC Lattice Gas Models
Fung F. Lee, Michael J. Flynn, and Martin Morf, Stanford University

4:30
A Modular and Scalable Course Grain Systolic Architecture for Scientific Computing
E.M. Dowling, and Z. Fu, University of Texas, Dallas and R.S. Drafz, Texas Instruments Inc.

4:50
New Real-Time Robot Motion Algorithms using Parallel VLSI Architectures
Arati S. Deo, Joseph R. Cavallaro, and Ian D. Walker, Rice University

CP7 Nonlinear Equations Bellaire

4:10
Parallel Iterative Methods for Solving Sparse Nonlinear Systems of Equations
John E. Dennis, Rice University and Xiaodong Zhang, University of Texas, San Antonio

4:30
Parallel HOMPAC: A Case Study in Parallel Mathematical Software
Kashmira M. Irani, Calvin J. Ribbens, and Layne T. Watson, Virginia Polytechnic Institute and State University

4:50
A Parallelized Algorithm for the Preconditioned Interval Newton Method
Chenyi Hu, University of Houston, Downtown; M. Bayoumi, and Baker Kearfott, University of Southwestern Louisiana; and Qing Yang, University of Rhode Island

CP8 Partial Differential Equations 2 Post Oak

4:10
Unstructured Finite Element Simulations for Data Parallel Architectures
Kapil K. Mathur, Thinking Machines Corporation

4:30
Solving Unstructured Mesh Problems with Domain Decomposed GMRES/ILU
P. Venkatakrishnan, NASA Ames Research Center; Joel Saltz, and Dimitri Mavriplis, ICASE, NASA Langley Research Center

5:10
Multigrid Waveform Relaxation Methods for Solving Parabolic Partial Differential Equations
Stefan Vandewalle, Catholic University of Leuven, Belgium

CP9 Iterative Linear Algebra 1 Galleria III

4:10
Parallelizable Restarted Iterative Methods for Nonsymmetric Linear Systems
Wayne Joubert and Graham Carey, University of Texas, Austin

4:30
A Newton Basis GMRES Implementation
Z. Bai, D. Hu, and Lothar Reichel, University of Kentucky

4:50
Iterative Methods for Nonsymmetric Systems on MIMD Machines
John N. Shadid and Ray S. Tuminaro, Sandia National Laboratories

CP10 Heterogeneous Network Processing Plaza III

4:10
Solving Computational Grand Challenges Using a Heterogeneous Network of Supercomputers
G.A. Geist and J.J. Dongarra, Oak Ridge National Laboratory and V.S. Sunderam, Emory University

4:30
Parallel Distributed Supercomputing in a Heterogeneous Environment Using High-Speed Communication Links
Paul R. Borman and Robert W. Numrich, Cray Research, Inc.

4:50
Parallelizing "Scatter-And-Gather" Applications Using Heterogeneous Distributed Computers
Yuan Shi and Kostas Blathras, Temple University

5:30 PM

Poster Session 1
Woodway II
(Complimentary beer, chips and dips will be served)

Efficient Logarithmic Time Parallel Algorithms for the Cholesky Decomposition of Band Matrices
Ilan Bar-On, Technion-Israel Institute of Technology, Israel

The Humming Hypercube
Stewart A. Levin, Mobil Research and Development Corp. and Richard Strong, University of California, Los Angeles

Parallel Algorithms for Solving Triangular Systems
Sanzheng Qiao and Xiaoyuan Tu, McMaster University, Canada

Parallel Complexity of Nevanlinna-Pick Interpolation
Cetin K. Koc and Guanrong Chen, University of Houston

MIMD Computers, Row-wise LU Factorization and Threshold Pivoting
Joel Malard, McGill University, Canada

Non-Orthogonal Interconnection for Massively Parallel Computation
J. Elliott Smith, Boston University

Parallel Prefix Computation with Few Processors
Omer Egecioglu, University of California, Santa Barbara; Bassam N. Elkhoury, Compaq Computer Corporation; Cetin K. Koc, University of Houston

Efficient Parallel Algorithms for the Maximum Sum Problem
Chih-Yu Chao, and Shou-Hsuan Stephen Huang, University of Houston

Cellular Automata and Excitable Media
Jorg R. Weimar, John J. Tyson, and Layne T. Watson, Virginia Polytechnic Institute and State University

Exact and Approximate Hypercube Reliabilities
Anant P. Godbole, University of California, Santa Barbara and Sanjay Khunger, Michigan Technological University

Improving Run-Time Performance of Static Task Schedules
Jiahuang Ji, Sam Houston State University and Kam-Hoi Cheng, University of Houston

Solution of Systems of ODEs on an INTEL Hypercube
Levi Lustman, Naval Postgraduate School

Response of a GCM Surface Climate to Variable Band Heat Sources at Midlatitude
K.J. Joseph Yip and G.R. North, Texas A&M University, College Station

A High Performance Parallel Approach to Orbit Generation and Propagation
Faiza S. Lansing, Edith P. Huang, and Ahmed R. Khatib, Jet Propulsion Laboratory

Parallel Adaptive and Time-stabilizing Schemes for Constant-Coefficients Parabolic PDEs
Dganit Amitai, Amir Averbuch, Tel Aviv University, Israel; Moshe Israeli, Technion-Israel Institute of Technology, Israel; and Samuel Itzikowitz, Tel Aviv University, Israel

Speedup and Superlinear Speedup
John L. Gustafson and Xian-He Sun, Ames Laboratory, U.S. Department of Energy

A Classification of Parallel Branch and Bound Algorithms
H.W.J.M. Trienekens, Erasmus University Rotterdam, The Netherlands

Facilities of PDEQSOL (Partial Differential Equation Solver Language) for Fluid Analysis
Hiroyuki Hirayama, and Miiko Ikeda, Hitachi VLSI Engineering Corp., Japan; Nobutoshi Sagawa, and Chisato Konno, Hitachi Central Research Laboratory, Japan

Structure and Performance of a Time-accurate, Incompressible Flow Simulation on a Massively Parallel Processor Versus a Vector Processor
Stephen R. Breit, Bolt Beranek and Newman Inc., Cambridge, MA

Distributed Data Structures in Monte Carlo Programs
David M. Amow, Brooklyn College

Using Direct and Iterative Methods for the Solution of (very) Large (sparse) Linear Systems Arising in Intermodulation Analysis of Microwave Mixers
Valeria Frontini, CINECA-Centro di Calcolo Interuniversitario dell'Italia Nord-Orientale, Italy

Simplified Hypercube Performance Comparisons via Service States
Gordon Lyon, National Institute of Standards and Technology

An Appropriate Representation for Tetrahedral Meshes in Finite Volume Computations
Fabio Guerinoni, Florida State University

A Parallel Algorithm for Solving the Traffic Assignment Problem
Omar Drissi-Kaitouni, Michael Florian, and Ismail Chabini, Universite de Montreal, Canada

Ring and Binary Tree Embeddings in the Cube-Connected Cycles Architecture with Dimensional Substitutes
Nian-Feng Tzeng, University of Southwestern Louisiana

Distributed Asynchronous Execution-Structures for Basic Iterative Methods
Jaroslav Nieplocha, Tsun Zee Mai, and Chester C. Carroll, University of Alabama, Tuscaloosa

CONFERENCE PROGRAM

(Poster Session continued)

Bridging the Parallel Hardware-Software Gap
George K. Jacob, Franz Inc., Berkeley

An Algorithm for Solving Minimization Problems on a Shared Memory Multiprocessor
Hong-Yuh Shy, and Mark H. Holmes, Rensselaer Polytechnic Institute

Parallel Huffman Coding on an Associative Processor
Cheng-Chang Lu, Kent State University

A Portable Parallel Programming Environment
Donna S. Reese and Ed Luke, Mississippi State University

Parallelization of Software for Sturm-Liouville Problems
Steven A. Pruess, Colorado School of Mines and *Charles T. Fulton*, Florida Institute of Technology

Parallel Implementation of Finite Element Methods on a 1024-processor Hypercube
Jenn-Ching Luo, and Morton B. Friedman, Columbia University

Parallel Methods for Stochastic Dynamic Programming
S.-L. Chung, *Floyd B. Hanson*, and H.-H. Xu, University of Illinois, Chicago

Parallel Implementations of Alternating Direction Implicit Collocation Methods for Solving Parabolic and Hyperbolic Problems on an IBM 3090-600J
Ryan I. Fernandes, and Graeme Fairweather, University of Kentucky

BLAS and FFT Performance on the Intel i860 Multiprocessor
Paul Harten, Hsin-Ying Lin, Hrabri Rajic, and *Daniel Wells*, Kuck and Associates, Champaign, IL

Issues in Parallel Data Access; an Alternative Approach
Gita Alaghband, University of Colorado, Denver

Performance Analysis of Vector Operations on the Intel i860 RISC Microprocessor
Roldan Pozo, and Bernardo Rodriguez, University of Colorado, Boulder

Distributed Sparse Cholesky Factorization
Alex Pothén and Chunguang Sun, Pennsylvania State University

LU Decomposition in a Distributed Memory Environment
Scott Stark and Antony Beris, University of Delaware

A Portable Random Number Generator for Parallel Computers
Peter C. Wollan, Michigan Technological University

Structured Parallel Programming for Scientific Computing
Zhiwei Xu, Polytechnic University

On Task Graphs in Algorithms Parallelization
Z. Mahjoub and F. Karoui-Sahtout, University of Tunis, Tunisia

Large-scale Data Processing on a NUMA Multiprocessor
Pattabiram Srinivasan and *Xiaodong Zhang*, University of Texas, San Antonio

Sharing Variables in Parallel Programs
Babak Bagheri and Balaji Raghavachari, Pennsylvania State University; Terry W. Clark, and L. Ridgway Scott, University of Houston

Faster FFTs on the CRAY-2 Supercomputer
David A. Carlson, Institute for Defense Studies

Financial Simulations on a Massively Parallel Connection Machine
James M. Hutchinson, Thinking Machines Corporation and Stavros A. Zenios, University of Pennsylvania

A Massively Parallel Algorithm for Nonlinear Stochastic Network Problems
Soren S. Nielsen, and *Stavros A. Zenios*, University of Pennsylvania

Parallel Splitting Methods for Second Order Time Dependent PDEs
A.Q.M. Khaliq, and D.A. Voss, Western Illinois University

The Analysis of Very Massively Parallel Programs
C. Gary Romel, Eastern Connecticut State University

A Data Parallel Distribution Analysis by Chain Algorithm (PDAC) in Multiple-Chain Closed Queueing Networks

Floyd B. Hanson, J.-D. Mei, C. Tier, and H.-H. Xu, University of Illinois, Chicago

Solution of Tridiagonal Linear Systems on the Intel iPSC/860
Sisira Weeratunga and Eric Barszcz, NASA Ames Research Center

Computational Performance Comparisons of DYNA3D on a CRAY X-MP, CRAY Y-MP, and STARDENT 2000
Myron Ginsberg, General Motors Technical Center

Energy Conservation, Stability, and Isotropy of a Parallel Algorithm for the (2+1) D Wave Equation
R.G. Hohlfeld, Boston University; S.M. Sparagna, Boston University and Raytheon Company; and G.v.H. Sandri, Boston University

Optimal Allocation of Shared Data over Distributed Memory Hierarchies
Emile Haddad, Virginia Polytechnic Institute and State University

Computer Algebra and a General Method of Solving Systems of Partial Differential Equations
Stephen K. Kalandros, Joseph P. Shectman, Lisa A. Dixon, and Peter Vafeades, Trinity University

Parallel Algorithms for Accelerated Projection Methods
Rajesh Aggarwal, Columbia University; David R. Dellwo, United States Merchant Marine Academy; and Morton B. Friedman, Columbia University

Optimal Scheduling of a Full Binary Tree and FFT Dags on Parallel Systems with Communication Delays
P. Markenscoff and Yong Yuan Li, University of Houston

Convex Hulls on a Hypercube
Carol Hazlewood, Southwest Texas State University

Transonic Flow Computations on a Parallel Distributed Memory Processor
R. Hall, W.S. Atkins Engineering Sciences, United Kingdom and D.J. Doorly, Imperial College, United Kingdom

Reliable Reconfiguration of WSI Structures
Dinesh Bhatia and V.S.S. Nair, Southern Methodist University

Reconfiguring Levelled Networks for Maximizing the Performance
Dinesh Bhatia, Southern Methodist University

The Design and Implementation of a Portable Parallel Circuit Simulator
Gung-Chung Yang, University of Illinois, Urbana

A Multipurpose DSP-VLSI Array for Parallel Matrix Computations in Signal Processing and Robotics
Kishore Kota, Nariankadu D. Hemkumar, and Joseph R. Cavallaro, Rice University

Probabilistic Routing in Distributed Architectures
Mitos D. Grammatikakis, University of Oklahoma

Parallel Implementation of Lee's Routing Algorithm
D. Sarma, Rutgers University and P. Holowko, University of Cincinnati

Performance Modeling and Analyses on a NUMA Multiprocessor
Xiaohan Qin, and *Xiaodong Zhang*, University of Texas, San Antonio

Multitasking and Vectorizing a Global Spectral Numerical Weather Prediction Model
Thomas Nehrkorn, *Ross N. Hoffman*, and Jean-Francois Louis, Atmospheric and Environmental Research, Inc., Cambridge, MA

Parallel Multigrid Revisited
Paul Frederickson, RIACS, NASA Ames Research Center and *Oliver A. McBryan*, University of Colorado, Boulder

Performance Models of Numerical Computations on the Connection Machine CM-2
Roldan Pozo, University of Colorado, Boulder

Graphical Design for Inference Processing on Massively Parallel Hardware
Peter G. Tripodes, Los Angeles City College

POMM - A Partially Orthogonal Multibus Multiprocessor
Cheng-Hsien Tung, and Christopher W. McCarron, University of Connecticut, Storrs

Parallel Algorithms Computing Structural Characteristics of Labeled Directed Graphs, their Hypercube Implementation and Performance Evaluation
Boleslaw Mikolajczak, Southeastern Massachusetts University and Mary Kehoe Moynihan, Cape Cod Community College

A Distributed Solution and Visualization of the Three-Dimensional Compressible Flow
Kwan-Liu Ma and *Kris Sikorski*, University of Utah

Software Architectures for Transputer-Based Applications
Brian K. Barnhart, Nichols Research Corp., Huntsville

The Iterative BLAS Package
Thomas C. Oppe, Florida State University

Three-Dimensional Modeling of Flow Through Saturated-Unsaturated Porous Media
Steven B. Yabusaki, and Harlan P. Foote, Batelle Pacific Northwest Laboratories

Parallel Computations for Linear Control Problems
Biswa Nath Datta, Northern Illinois University

Parallel FFTs with Application to Nonlinear Schroedinger Equations
M. Minkoff and D. Malon, Argonne National Laboratory and D. Anderson, Northwestern University

Old Random Number Generators in Newly Parallel Programs
David M. Malon, Argonne National Laboratory

A Divide-and-Conquer Implementation of the Simplex Method on a Massively Parallel Hypercube Machine
Xiaojing Wang, Timothy Hickey, Z. George Mou, Brandeis University

Functional Parallelism and Atomic Scattering Theory
E.J. Manky, Georgia Institute of Technology

A Parallel Algorithm for Implicit Transient Solutions of the Incompressible Navier-Stokes Equations
Sam Z. Yu, A. Daniel Kowalski, and Richard R. Peskin, Rutgers University

Parallel Matrix Decomposition Algorithms for Solving Orthogonal Spline Collocation Equations
Karin R. Bennett, Bernard Bialecki, and Graeme Fairweather, University of Kentucky

Fast Poisson Solvers for Least Squares Orthogonal Hermite Bicubic Collocation Approximations
Karin R. Bennett, *Bernard Bialecki*, and Graeme Fairweather, University of Kentucky

Fast Parallel Triangulation of 3D Data on the Connection Machine
Bryant W. York, and Robert L. Carter, Boston University

Characterization of Parallel Algorithms
Maria Calzarossa and Valeriano Comincioli, Università di Pavia, Italy and *Giuseppe Serazzi*, Università di Milano, Italy

A Massively Parallel Algorithm for Traveling Salesman Problem
Kemal Efe, University of Southwestern Louisiana

Transient Two-Phase Subchannel Analysis on Advanced Architecture Computers
John A. Turner, Los Alamos National Laboratory

On the Synthesis of Programs for Various Parallel Architectures
H. Allan Fencil and *Chua-Huang Huang*, Ohio State University

Visual Real-Time Display of Radar Processor Data
Jennifer Chong, and Christine Speck, Hughes Aircraft Company

A Spatial Domain Decomposition of the Nodal Neutron Diffusion Equations for Parallel Computers
B.L. Kirk and Y.Y. Azmy, Oak Ridge National Laboratory

A Fast Sparse Matrix Solver on the CRAY-2 for Circuit Simulation
Chia-Jiu Wang, University of Colorado, Colorado Springs and Michael A. Ess, University of Colorado, Colorado Springs and Cray Computer Corporation

Hydrocode Development on the NCUBE2 Hypercube
Allen C. Robinson, Courtenay T. Vaughan, and Huei Eliot Fang, Sandia National Laboratories

CONFERENCE PROGRAM

(Poster Session continued)

Performance of Parallel Graph Algorithms on Distributed-Memory Computers

Sajal K. Das, and Cui-Qing Yang, University of North Texas

Asynchronous Methods for Overlapping Epsilon-Nested Linear Systems

A. Zecevic, and D.D. Siljak, Santa Clara University

Additive Schwarz Algorithms for Parabolic Convection-Diffusion Equations

Xiao-Chuan Cai, University of Kentucky

Application of the Monotonic Logical Grid for Parallel Processing

Patricia L. Patterson, Solitronics

Parallel Solution of Particle Motion in Turbulent Flows

Raghu Machiraju and M.L. Mittal, Ohio Supercomputer Center

Parallel Simulation of ART Architectures

Chwan-Hwa Wu, Auburn University and Chia-Jiu Wang, University of Colorado, Colorado Springs

The Distributed Solution of Linear Systems Using the Torus Wrap Data Mapping

Cleve Ashcraft, Boeing Computer Services

A Parallel Particle Tracking Code for Groundwater Contaminant Transport on the Connection Machine

Michael A. Muller, Rachid Ababou, and Chin S. Lin, Southwest Research Institute

A Semi-automatic Scheduling Methodology for Distributed Memory Systems

Sesh Venugopal, Rutgers University and Vijay K. Naik, IBM Thomas J. Watson Research Center

Linear Algebra Calculations on the BBN TC2000

P.R. Amestoy, CERFACS, France; M.J. Dayde, ENSEEIHT-IRIT, France; Iain S. Duff, Rutherford Appleton Laboratory, United Kingdom and CERFACS, France; and P. Moree, ENSEEIHT-IRIT, France

Fast Plane Rotation Algorithms with Dynamic Scaling on Vector Supercomputers

Andrew A. Anda and Haesun Park, University of Minnesota, Minneapolis

Parallel Quadrature Over the N-Dimensional Simplex

Elise de Doncker, J. Kapenga, and I. Vakalis, Western Michigan University

Parallel Extrapolation to the Limit for ODEs

Greg Astfalk, Convex Computer Corp., Greenbelt, MD

Iterative Methods on Massive Parallel Computer Architectures

Ping Lee, Schlumberger Laboratory for Computer Science

Parallel Simulated Annealing Algorithm Applied to the Directed Steiner Problem on Networks

Lawrence J. Osborne, Lamar University and Billy E. Gillett, University of Missouri, Rolla

A Parallel Algorithm for Non-Symmetric Algebraic Eigenvalue Problem

Pradeep Misra, Wright State University

Cost and Benefits of Floating Point Hardware in SIMD Massively Parallel Computers

S. Tidu and M. Maresca, DIST-Universita di Genova, Italy

Self-Scheduling of Different Work Profiles

Rahul Chattergy, University of Hawaii

Parallelizing ITPACKV 2D for the Cray Y-MP

Malathi Ramdas and David R. Kincaid, University of Texas, Austin

Rounding Error in Parallel Evaluation of Polynomials

Daniela Calvetti, Stevens Institute of Technology

Solving Quadratic Programs with Box Constraints on a Massively Parallel Connection Machine

Mike McKenna and Jill Mesirov, Thinking Machines Corporation and Stavros Zenios, University of Pennsylvania

VISTA: A System for Remote Visualization

A. Tuchman and George Cybenko, CSRD, University of Illinois, Urbana

TUESDAY MORNING, MARCH 26

8:00/Galleria Foyer I-IV

Registration Desk Opens

8:30/Galleria I-II

IP3

Physical Analogies in Computation

The increasing power of computers enables one to tackle larger and larger problems. Further, one needs to find approaches that can be "parallelized" on massively parallel machines. Physical analogies provide naturally parallel methods for large systems. These give methods such as simulated annealing and genetic algorithms for optimization; neural networks for artificial intelligence; and generally, the complex system approach to fields such as economics.

The speaker will review some of the basic ideas and the progress that has been made.

Geoffrey C. Fox

Department of Physics

California Institute of Technology

9:30/Galleria I-II

IP4

Visualization in Parallel Computational Mechanics Research

The speaker will show and discuss how we have been using visualization in an object-oriented environment to develop irregular mesh partitioning schemes for domain decomposition algorithms, to map finite element submeshes onto parallel processors, to analyze memory and communication requirements, and sometimes iteration counts. Also, the speaker will discuss real-time post-processing and animation in solid and fluid mechanics (we have interconnected an IRIS to a CM2) and how this has improved our understanding of some physical and engineering phenomena.

Charbel Farhat

Department of Aerospace Engineering Sciences

University of Colorado, Boulder

10:30-11:00

Coffee

11:00-12:00

Concurrent Sessions (Selected)

SP10 Multilevel Methods

Tanglewood

11:00

A Greatly Simplified Theory for Parallel Multilevel Methods

Craig C. Douglas, IBM Thomas J. Watson Research Center

11:30

Mapping Implicit Spectral Methods to Scalable Memory Architectures

Andrea L. Overman, NASA Langley Research Center and John Van Rosendale, ICASE, NASA Langley Research Center

SP11 Visual Programming

Bellaire

11:00

Examples in Phred

Adam Beguelin, University of Tennessee, Knoxville and Gary Nutt, University of Colorado, Boulder

11:30

An Experimental Study of the Effectiveness of High Level Parallel Programming

Ravi Jain, John Werth, and J.C. Browne, University of Texas, Austin and Indranil Chakravarty, Schlumberger Laboratory for Computer Science

SP12 Partial Differential Equations 4

Post Oak

11:00

CFD Equations Solution on Massively Parallel Computers

C. de Nicola, University of Naples, Italy; G. De Pietro, Parallel Informatic Systems Research Institute, C.N.R., Italy; and P. Schiano, Italian Aerospace Research Center, Italy

11:30

Explicit/Implicit Domain Decomposition Procedures for Time Dependent Problems

Clint Dawson, Rice University; Todd Dupont, University of Chicago and Q. Du, Michigan State University

TUESDAY AFTERNOON, MARCH 26

12:00

Lunch

1:30/Galleria I-II

IP5

Cellular Automata and Classical Numerical Methods: Two Sides of the Same Coin

Lattice gas cellular automata have recently been promoted as viable computational tools for modeling physical systems. This has been confirmed by recent simulations of flow through porous media. These methods are finding a status in the computational stable beside more traditional methods, with finite differences on one side and molecular dynamics on the other. Their structure is well suited for efficient implementation on massively parallel machines.

The speaker will begin with a brief introduction to lattice gases in which some of their strengths and weaknesses as computational tools are discussed. He will then review the status of convergence results, citing relations to those for classical numerical methods. The speaker will also present an overview of a class of finite difference schemes which are derived from a kinetic description of lattice gases, the so-called lattice Boltzmann schemes.

C. David Levermore

Department of Mathematics

University of Arizona

2:30-3:00

Concurrent Sessions (Selected)

SP13 Performance Analysis

Tanglewood

2:30

A Comparison of Parallel Architectures

Oliver A. McBryan, and Roldan Pozo, University of Colorado, Boulder

SP14 Compilation/Unstructured Grids

Bellaire

2:30

Support for Parallel Unstructured Scientific Computations

Charles Koebel, Rice University and Piyush Mehrotra, ICASE, NASA Langley Research Center

SP15 Sparse Linear Algebra

Post Oak

2:30

A Unified Computational Model for the Parallel Solution of General Sparse Nonsymmetric Linear Systems on Shared-memory Multiprocessors

Gung-Chung Yang, University of Illinois, Urbana

CONFERENCE PROGRAM

3:00-3:30
Coffee

3:30-4:00 Concurrent Sessions (Selected)

SP16 Multigrid

Tanglewood

3:30

An Optimal Parallel Time Multigrid Algorithm
Naomi H. Naik, Vassar College and John Van Rosendale, ICASE, NASA Langley Research Center

SP17 Fast Fourier Transforms

Bellaire

3:30

The Fractional Fourier Transform and Applications
David H. Bailey, NASA Ames Research Center and Paul N. Swartztrauber, National Center for Atmospheric Research

SP18 Eigenvalues

Post Oak

3:30

An Efficient Parallel Homotopy Algorithm for Unsymmetric Eigenproblems with $O(n)$ Running Time
Zhonggang Zeng, Xiaola Lin, T.Y. Li, Michigan State University

4:10-5:30 Concurrent Sessions (Contributed)

CP11 Memory Access

Tanglewood

4:10

Parallel Processor Memory Reference Analysis: Examining Locality and Clustering Potential
Timothy Mark Pinkston, Stanford University and Sandra Johnson Baylor, IBM Thomas J. Watson Research Center

4:30

Performance Issues for Message-Passing MIMD Machines
James W. Kho, California State University, Sacramento

4:50

A Study on Three Parallel Programming Paradigms
Z. George Mou, Brandeis University

5:10

Optimal Balanced Assignments and a Parallel Database Application
Shahram Ghandeharizadeh, University of Southern California; Robert R. Meyer, Gary L. Schultz, and Jonathan Yackel, University of Wisconsin, Madison

CP12 Optimization 1

Bellaire

4:10

Parallel and Symbolic Computation in Finance
Marida Bertocchi, and Enrico Cavalli, University of Bergamo, Italy and Giovanni Zambruno, University of Milano, Italy

4:30

Massively Parallel Computing for Financial Modeling Under Uncertainty
Stavros A. Zenios, University of Pennsylvania

4:50

Performance of a Benchmark Implementation of the Van Slyke and Wets Algorithm for Stochastic Programs on the Alliant FX/8
K.A. Ariyawansa, Washington State University

5:10

A Parallel Implementation of an Interior Point Method for Linear Programming
Anthony Vannelli, University of Waterloo, Canada

CP13 Partial Differential Equations 3

Post Oak

4:10

Parallelizing Across Time When Solving Time-Dependent PDEs
Patrick H. Worley, Oak Ridge National Laboratory

4:30

A Parallel Algorithm to Solve Two Phase Flow and Transport Problems in Porous Media
Joseph Guarnaccia, Princeton University and George F. Pinder, University of Vermont

4:50

Parallelization and Convergence of a 3-D, Implicit, Unsteady, Turbomachinery Flow Code
Gregory J. Henley, and J. Mark Janus, Mississippi State University

5:10

Parallel Linear Algebra for BVP's with Non-separated Boundary Conditions
Ian Gladwell, Southern Methodist University and Marcin Paprzycki, University of Texas of the Permian Basin

CP14 Linear Algebra 1

Galleria III

4:10

An Iterative Lanczos-Based Condition Estimator
William R. Ferng, North Carolina State University and Robert J. Plemmons, Wake Forest University

4:30

A Vector/Parallel Implementation of the Multifrontal Method for Sparse Symmetric Definite Linear Systems on the CRAY Y-MP
Phuong Vu, and Chao Yang, Cray Research, Inc.

4:50

A Parallel SVD Algorithm Based on Householder Reflections
William D. Shoaff, Florida Institute of Technology

5:10

Parallel ICCG Algorithm on Distributed Architecture
E.M. Daoudi and P. Manneback, Faculte Polytechnique de Mons, Belgium

CP15 Cellular Automata

Plaza I

4:10

Cellular Automata Modeling Isotropic Growth of Clusters of Arbitrary Morphology and their Application to the Study of Heterogeneous Reacting Systems
K. Zygorakis, Rice University and P. Markenscoff, University of Houston

4:30

The Monte Carlo Simulation of the Random 3D Ising Model on a Parallel Computer AP1000
Sakari Inawashiro, Tohoku University, Japan and Kosei Yamamoto, Fujitsu, Ltd., Japan

4:50

Fluctuation Simulations for Stochastic Reaction Diffusion Systems
D.J. Hebert, University of Pittsburgh

5:10

Hydrocode Development on the Connection Machine
Huei Eliot Fang, and Allen C. Robinson, Sandia National Laboratories and Kah-Song Cho, Thinking Machines Corporation

5:30-7:00

Poster Session 2

Woodbury II

(There will be a cash bar. Chips and dips complimentary.)

This is a repeat presentation. Refer to **Poster Session 1** listed on pages 5-7.

WEDNESDAY MORNING, MARCH 27

8:00/Galleria Foyer I-IV

Registration Desk Opens

8:15

Closing Remarks

8:30/Galleria I-II

IP 6

Algorithmic Aspects of Domain Decomposition and Fictitious Domain Methods

In this presentation, the speaker will address the algorithmic aspects of domain decomposition and fictitious domain methods. Concentrating more particularly on finite element approximations, he will discuss several important computational issues, such as preconditioning of the interface iterations, multilevel speeding up of the interface iterations, and the influence of the discrete space choice for the multipliers associated to the interface matching conditions.

He will focus on domain decomposition and fictitious domain methods without overlapping, and will present numerical results.

Roland Glowinski

Department of Mathematics
University of Houston

9:30-10:00

Concurrent Sessions (Selected)

SP19 Performance Evaluation

Tanglewood

9:30

A Novel Performance Model for Asynchronous Parallel Processing
Kenichi Miura, Fujitsu America, Inc.

SP20 Linear Algebra

Bellaire

9:30

Orthogonal Factorizations in LAPACK
Christian H. Bischof, Argonne National Laboratory

SP21 Compilation/Distributed Memory

Post Oak

9:30

Runtime Compilation for Distributed Memory Multicomputers
Janet Wu, Harry Berryman, and Joel Saltz, ICASE, NASA Langley Research Center and Yale University

9:30-10:00

SS1 Large-Scale Modeling in Petroleum Reservoir Engineering and Seismic Problems 1*

Galleria I-II

Reservoir Simulation on Distributed Memory Parallel Processors
John E. Killough, University of Houston

10:00-10:30

Coffee

* Special Sessions 1-4 were organized and chaired by Mary F. Wheeler, Department of Mathematical Sciences, Rice University.

CONFERENCE PROGRAM

10:30-11:00 Concurrent Session (Selected)

SP22 Performance Analysis Tanglewood

10:30
Performance Analysis of a 24 Code Sample on Cray X/Y-MP Systems at the Ohio Supercomputer Center
George Delic, Ohio Supercomputer Center

SP23 Optimization Bellaire

10:30
Direct Search Methods on Parallel Machines
J.E. Dennis, Jr., and Virginia Torczon, Rice University

SP24 Portable Programming Post Oak

10:30
Portable Parallel Programming: Cross Machine Comparisons for SIMPLE
Calvin Lin and Lawrence Snyder, University of Washington

10:30-11:00

SS2 Large-Scale Modeling in Petroleum Reservoir Engineering and Seismic Problems 2*

Galleria I-II
Practical Considerations for Linear Solvers in Reservoir Simulators on Parallel Machines
Alvis McDonald, J.A. Pita, Mobil Research and Development Corporation, and David Pace, Thinking Machines Corporation

11:00-12:00 Concurrent Sessions (Contributed)

CP16 Fast Fourier Transforms Tanglewood

11:00
A Symmetric FFT for MIMD Hypercubes
Richard B. Pelz, Rutgers University

11:20
A Parallel Reduced Transform Algorithm to Compute $P^N \times P^N$ 2D DFT with No Interprocessor Communication
Izidor Gertner, Martin Rofheart, and Richard Tolimieri, The Graduate School and University Center City University of New York

11:40
Study of an Adaptive Blocking for a Parallel Nested Dissection Algorithm
P. Charrier and J. Roman, University of Bordeaux I, France

CP17 Optimization 2 Bellaire

11:00
On the Performance of Algorithms for Large-Scale Bound Constrained Problems
Jorge J. Moré, Argonne National Laboratory

11:20
Parallel Stochastic Global Optimization
Scott Stark, University of Delaware

11:40
A New Algorithm for Parallel Simulated Annealing Optimization
Michael D. Upton, University of Washington and Seattle Silicon Corporation

CP18 Partial Differential Equations 4 Post Oak

11:00
Krylov Exponential Propagation in Computational Fluid Dynamics
Y. Saad, University of Minnesota, Minneapolis; E. Gallopoulos and B. Semeraro, University of Illinois, Urbana

11:20
Parallel Solution of the Few-Group Neutron Diffusion Equations
Hisham N. Sarsour, Paul J. Turinsky, Charles S. Henkel, North Carolina State University

11:40
On the Application of Supercomputers for History Matching Multiphase Oil Reservoir Models
Jianping Zhu, Mississippi State University and Yungmin Chen, State University of New York, Stony Brook

CP19 Iterative Linear Algebra 2 Galleria III

11:00
Projection Methods on a Distributed Memory MIMD Multiprocessor
Chandrika Kamath, Digital Equipment Corporation and S. Weeratunga, NASA Ames Research Center

11:20
Multilevel Preconditionings for 3D Problems of Massively Parallel Computers
A. Yu. Yeremin, USSR Academy of Sciences

11:40
Vector/Parallel Preconditioned s-Step Methods on the IBM 3090/600S/6VF
Michael Pernice, University of Utah and A.T. Chronopoulos, University of Minnesota, Minneapolis

CP20 Load Balancing Plaza I

11:00
On the Communication and Load Balancing Issues in Parallel CFD Applications
Vijay K. Naik, IBM Thomas J. Watson Research Center

11:20
A Comparison of Load Balancing Strategies for Particle Methods Running on MIMD Multiprocessors
Scott B. Baden, University of California, San Diego

11:40
Load-Balancing and Performance of a Gridless Particle Simulation on MIMD, SIMD, and Vector Supercomputers
Steve Plimpton, Isaac Shokair, and John Wagner, Sandia National Laboratories

11:00-12:00

SS3 Large-Scale Modeling of Petroleum Reservoir Engineering and Seismic Problems 3*

Galleria I-II
11:00
Reservoir Simulation on a Massively Parallel SIMD Computer
Jeffrey M. Rutledge, Chevron Oil Field Research Company

11:30
A New Parallel Iterative Linear Solution Method for Large Scale Reservoir Simulation
John Wallis, Western Integrated Technologies

WEDNESDAY AFTERNOON, MARCH 27

12:00

Lunch

1:30/Galleria I-II
IP7

The Parallelization of an Oil Reservoir Simulator (tentative)

Diederik T. Van Daalen
General Research and Mathematics Department
Koninklijke/Shell Exploratie en Produktie Laboratorium, The Netherlands

2:30

Coffee

3:00-4:00

Concurrent Sessions (Contributed)

CP21 Block Linear Algebra Tanglewood

3:00
Implementing Efficient and Portable Dense Matrix Factorizations
Richard B. Lehoucq, IMSL, Inc.

3:20
How to Tune LAPACK
Edward Anderson, University of Tennessee, Knoxville

3:40
Parallel Block Matrix Factorizations on the Shared Memory Multiprocessor IBM 3090 VF/600J
Krister Dackland, Erik Elmroth, and Bo Kagstrom, University of Umea, Sweden

CP22 Data and Loop Transformations Bellaire

3:00
Data Optimization and Its Effect on Communication Costs in MIMD Fortran Code
Kathleen Knobe, Compass, Inc., Wakefield, MA and Joan D. Lukas, University of Massachusetts, Boston, and Compass, Inc.

3:20
A Fresh Look at Loop Transformations and Their Interaction
Jagannathan Ramanujam, Louisiana State University

3:40
Maximum Performance Code Restructuring for Hierarchical Memory RISC Computers
Hrabri Rajic and Sanjiv Shah, Kuck and Associates, Champaign, IL

CP23 Asynchronous Iteration Post Oak

3:00
Parallel Asynchronous Nonlinear Iteration and Domain Decomposition
A.K. Stagg and G.F. Carey, University of Texas, Austin

3:20
Asynchronous Iterative Techniques for Transputers
M.K. Bane and T.L. Freeman, University of Manchester, United Kingdom

3:40
An Asynchronous Relaxation Method for the Parallel Simulation of Learning of Recurrent Neural Networks with Terminal Attractors
Chwan-Hwa John Wu and Jyun-Hwei Tsai, Auburn University

CONFERENCE PROGRAM

CP24 Performance Evaluation Galleria III

3:00
Fine-Grained Measurements of Loop Performance on the CRAY Y-MP
David K. Bradley and John L. Larson, University of Illinois, Urbana

3:20
Performance Comparison of Several SIMD Machines
Rod Fatoohi, NASA Ames Research Center

3:40
Random-Access Bandwidth Requirements of Point Parallelism in Grid-Based Problems
William Celmster, BBN Advanced Computers Inc., Cambridge, MA

CP25 Software Plaza I

3:00
Vectorization and Parallelization of FISHPAK
Roland A. Sweet, University of Colorado, Denver

3:20
PCG/CM: A Package for the Iterative Solution of Large Sparse Linear Systems on the Connection Machine
Wayne Joubert, University of Texas, Austin; Peter Highnam, Schlumberger Laboratory for Computer Science and Graham Carey, University of Texas, Austin

3:40
LAPACK for Distributed Memory Architectures: Progress Report
Annamaria Benzoni, Jack Dongarra, Steve Moulton, Susan Ostrouchov, Bernard Tourancheau, and Robert van de Geijn, University of Tennessee, Knoxville

3:00-4:30

SS4 Large-Scale Modeling in Petroleum Reservoir Engineering and Seismic Problems 4*

Galleria I-II

3:00
Large-Scale Computing Problems in Seismic Imaging
Irshad R. Mufti, Mobil Research and Development Corporation

3:30
Application of Cray Vector/Parallel Processors in Enhanced Oil Recovery Simulation
Kamy Sephrnoori and Gary A. Pope, University of Texas, Austin

4:00
Multitasking of a Reservoir Simulator on the Cray XMP
Gary Li, BP Exploration, Inc.

4:30 PM

Conference Adjourns

SOFTWARE AND BOOK EXHIBITS

Please be sure to visit the computer and book exhibits located in Woodway Exhibit Hall. The hours for book purchases and computer demonstrations will be as follows:

Monday, March 25 9:30 am - 5:00 pm
Tuesday, March 26 9:30 am - 5:00 pm
Wednesday, March 27 9:30 am - 11:00 am

Publishers

American Mathematical Society
Providence, RI

Cambridge University Press
New York, NY

Software Exhibits

Wolfram Research, Inc.

Product: Mathematica: A System for Doing Mathematics by Computer

Mathematica is both an interactive calculation tool and a programming language. Its numerical capabilities include arbitrary precision arithmetic and matrix manipulation and it can manipulate formulae directly in algebraic form. Mathematica can also generate two-dimensional plots, contour plots and shaded-color three-dimensional pictures. Mathematica runs on Apollo, Ardent, DEC, Data General, Hewlett-Packard, MIPS, 386-based MS-DOS, Mackintosh, NeXT, RISC System/6000, Silicon Graphics, Sony, Stellar, and Sun computers.

NAG, Inc.

The Numerical Algorithms Group, developers of the NAG Fortran Library, will display information on the mathematical and scientific subroutines contained in their libraries for parallel machines. Included will be information on the new NAG C Library and version 3 of the NAG Graphics Library.

Also on display, VecPar 77. VecPar77 provides the Fortran programmer with an interactive tool suite for optimizing programs in parallel environments. As an interactive tool, the user can obtain greater parallel performance gains than using an optimizing compiler alone.

UPCOMING CONFERENCES

May 6-8, 1991

Fifth Conference on Domain Decomposition Methods for Partial Differential Equations
Omni Hotel
Norfolk, VA

July 8-12, 1991

Second International Conference on Industrial and Applied Mathematics (ICIAM 91)
Sheraton Washington Hotel
Washington, D.C.

September 11-14, 1991

Fourth SIAM Conference on Applied Linear Algebra
Radisson Metrodome Hotel
Minneapolis, MN

GET-TOGETHERS

SIAM Welcoming Reception

Sunday, March 24, 1991 7:00 pm-9:00 pm
Plaza #1
Cash Bar - assorted mini hors d'oeuvres

At Poster Session 1

Monday, March 25, 1991 5:30 pm-7:00 pm
Woodway II

Come and join your colleagues to participate in the exchange of ideas with the presenters and others who have interest in their work. During the session, complimentary beer, chips and dips will be served.

Poster presenters will be able to set up their display materials starting at 12:00 noon in the Woodway II room.

At Poster Session 2

Tuesday, March 26, 1991 5:30 pm-7:00 pm
Woodway II

Once again you are invited to join your colleagues to participate in the exchange of ideas generated by the poster presentations.

There will be a cash bar during the session. Chips and dips will be available.

November 4-8, 1991

Second SIAM Conference on Geometric Design
Sheraton Tempe Mission Palms Hotel
Tempe, AZ

December 2-4, 1991

Fourth International Conference on Numerical Combustion
Tradewinds Hotel
St. Petersburg, FL

January 27-29, 1992

Third ACM-SIAM Symposium on Discrete Algorithms (SODA)
Clarion Hotel
Orlando, FL

TRANSPORTATION

By Air

Continental Airlines has been chosen as the official carrier for this conference. You can fly to Houston and save on travel from March 22-29, 1991 inclusive.

In a special arrangement with SIAM, Continental Airlines is offering you the services of their toll-free convention reservation desk, along with a complement of discounts.

- 5% off any fare for which you qualify, including First Class and Ultra Saver fares. THE DISCOUNTS CAN RANGE FROM 40%-70% OFF NORMAL COACH FARES!

OR... for those of you who do not qualify for the above discounts

- Continental Airlines will offer minimum of 40% off regular coach fares. Those passengers originating in Canada will be offered a 35% discount off full coach fares. Both of these rates require a 7 day advance purchase.

To make reservations for one of the above discounted fares:

- Call Continental Airlines Convention Desk, at 1-800-468-7022 seven days a week 6:00 AM to 12:00 Midnight Eastern Time. Be sure to mention the SIAM Easy Access Code: EZ #3P34. Continental Airlines will arrange to mail your tickets to your home or office.
- Those of you using a corporate or university travel agent, you may still purchase your ticket through your local agent, just be sure to mention to your agent the above discounts. Your local agent can call the Continental Airlines Convention Desk to make your reservation. Make sure that the agent uses the SIAM Easy Access Code: EZ#3P34

PUBLIC TRANSPORTATION

From the Airport

The Galleria Complex offers easy access to and from Houston's Intercontinental and Hobby Airports. The Post Oak Airport Terminal is located three blocks from the Galleria Complex. Free shuttle transportation is provided to and from the hotels from the terminal.

Houston is served by two airports: Hobby Airport and Intercontinental Airport. Access from both airports to the Westin Galleria can be made at the baggage claim/ground transportation areas where shuttle service to the Post Oak airport terminal is as follows:

Intercontinental Airport

From the Intercontinental Airport to the Post Oak Terminal, Airport Express runs every 30 minutes, from 5:00 am - 11:00 pm., daily. Fare is \$8.50 each way and the trip takes about 45 minutes to an hour.

Taxi is \$30.00 each way when you specifically request the "Zone Fare". Approximate travel time is 45 minutes.

Hobby Airport

From Hobby Airport to the Post Oak Terminal, take the Hobby Airport Limo service which leaves every 30 minutes from 7:30 am - 11:30 pm daily. Fare is \$5.00 and the trip can take 45 minutes to an hour.

CAR RENTAL

BUDGET-RENT-A CAR has been selected as the official car rental agency for this conference. The following rates will apply between March 17 through April 4, 1991.

Type of Car	Daily Rate	Weekly Rate
Economy	\$29	\$145
Intermediate	\$35	\$175
Standard	\$37	\$185

Reservations

We encourage you to make an advance reservation, as on-site availability cannot be guaranteed. Make reservations by calling 1-800-772-3773. When making reservations, be sure to give the SIAM Rate Code: VNR2PP. You should also mention that you are attending the SIAM Conference on Parallel Processing March 25-27, 1991 in Houston, in order to receive the indicated rates.

- Cars may be picked up at either Hobby or the Intercontinental Airport at the Budget Car Rental desk located in the baggage claim area.
- Cars must be picked up and dropped off at the same location.
- You must be 21 years of age and have a valid U.S. or international driver's license.
- You will be given unlimited free mileage.
- You must have one of the following credit cards to rent a car: AMEX, MasterCard, VISA or Diners Club.
- The prices quoted do not include refueling services, tax, optional collision damage waiver, and personal accident insurance.

HOTEL INFORMATION

Westin Galleria and Westin Oaks Hotels
5060 West Alabama Drive
Houston, TX 77056
(713) 960-8100

SIAM is holding a block of rooms at the Westin Galleria and Westin Oaks Hotels on a first come first served basis at the specially discounted rates of \$85.00 single and \$105.00 double. Please note that all rates are subject to an occupancy/sales tax of 14%. These rooms will be held for our exclusive use until March 8, 1991, after which reservations will depend on availability. A deposit in the amount of one night's room rate is required to confirm reservations. We urge you to make your reservations as soon as possible. You may do so by telephoning (713) 960-8100 or by using the Hotel Reservation Form on the inside back page of this program (domestic mail only). When making reservations, you must identify yourself as an attendee at the SIAM Conference on Parallel Processing in order to obtain the discounted rate.

Late Arrival Policy: If you plan to arrive after 6:00 PM you must inform the Westin of your plans and guarantee reservation with a credit card or check in the amount of one night's room rate.

Check In: Check-in time is 3:00 PM, check-out time is 1:00 PM. If you need to change or cancel your reservation, please be certain to do so 48 hours prior to the date of your arrival to avoid being penalized.

Facilities: The Westin Galleria Hotel is equipped with two heated outdoor pools and a jogging track. Guests of the Westin Galleria may utilize the University Club, a fully-equipped and professionally staffed private health and recreation facility. The University Club offers indoor tennis, squash, racquetball, swimming, saunas, whirlpool, massage therapy and the latest in exercise equipment. For guests of the Westin, a daily fee of \$10.00 is charged.

Restaurants and shopping: The Westin Galleria is connected to the Galleria Complex, a shopping mall. The Galleria Complex, modeled after the famed Galleria Vittorio Emanuele in Milan, Italy, is the most often visited attraction in Houston. You can shop at some of the world's most glamorous stores. You can see a show or browse through an art gallery. You can even skate on a sparkling ice rink located in the center of the complex. The restaurants located in the Galleria Mall and Westin Hotels cover the spectrum of food types and prices. Anything from a quick taco to a lavish French dinner can be found at the Galleria.

Parking: The Westin Galleria does have valet parking at \$9.00 per day. There is also the Galleria Parking complex that is complimentary to hotel guests and mall shoppers, and is connected to the hotel.

Telephone Messages: The telephone number at the Westin Galleria Hotel is 1-713-960-8100. The Westin Galleria will either connect the caller with the SIAM registration desk or forward a message to your hotel room.

REGISTRATION INFORMATION

Please complete the Advance Registration Form on the inside back cover and return it in the envelope provided. We urge attendees to register in advance to take advantage of the lower registration fee. Advance registration must be received by March 18, 1991.

The registration desk will be open as listed below.

Saturday, March 23 5:00 pm-8:00 pm
Sunday, March 24 8:00 am-3:30 pm
 7:00 pm-9:00 pm
Monday, March 25 7:30 am-4:30 pm
Tuesday, March 26 8:00 am-4:30 pm
Wednesday March 27 8:00 am-2:00 pm

PROCEEDINGS

The proceedings will be published in early 1992. A copy is included in your registration fee and will be sent to you upon publication.

NOTICE

There will be no prorated fees. No refunds will be issued once the conference has started.

If SIAM does not receive your Advance Registration Form by March 18, 1991 you will be asked to give us a check or a credit card number at the conference. We will not process either until we have ascertained that your registration form has gone astray. In the event that we receive your form after March 18, 1991, we will destroy your check or credit card slip.

CREDIT CARDS

SIAM accepts VISA, MasterCard and American Express for the payment of registration fees and special functions. When you complete the Advance Registration Form, please be certain to indicate the type of credit card, the number, and the expiration date.

SIAM CORPORATE MEMBERS

Non-member attendees who are employed by the following institutions are entitled to the SIAM member rate.

Aerospace Corporation
 Amoco Production Company
 AT&T Bell Laboratories
 Bell Communications Research
 Boeing Company
 BP America
 E.I. du Pont de Nemours & Company
 Eastman Kodak Company
 Exxon Research and Engineering Company
 General Motors Corporation
 GTE Laboratories, Inc.
 Hollandse Signaalapparaten B.V.
 IBM Corporation
 ICASE
 IMSL, Inc.
 Lockheed Corporation
 MacNeal-Schwendler Corporation
 Martin Marietta Energy Systems
 Mathematical Sciences Research Institute
 NEC Research Institute, Inc.
 Supercomputing Research Center,
 a division of Institute for Defense Analyses
 Texaco, Inc.
 United Technologies Corporation

REGISTRATION FEES:

		SIAG/SC	SIAM Member	Non-Member	Student
Tutorial *	Advance	\$115	\$115	\$135	\$55
	On-Site	\$135	\$135	\$155	\$75
Conference **	Advance	\$145	\$150	\$180	\$50
	On-Site	\$175	\$180	\$220	\$50

*Lunch is included in the cost of registration for tutorial attendees.

**A copy of the proceedings is included in the cost of registration for conference attendees.

New

SIAM Journal on Optimization

A quarterly journal for:

- Aeronautical, chemical, civil, electrical, environmental, and mechanical engineers engaged in optimal design.
- Modelers concerned with optimal parameter selection such as chemists, geophysicists, physicists, and statisticians.
- Mathematical scientists concerned with the existence of solutions and with the design and analysis of continuous and discrete algorithms.
- Software and algorithm developers in computer science, mathematics, and operations research.

The editors are inviting submissions on algorithms, applications, and existence and uniqueness theory of:

- Linear and Quadratic Programming ■ Mixed Integer Programming
- Large Scale Optimization ■ Nonsmooth Optimization
- Stochastic Optimization ■ Convex Analysis ■ Combinatorial Optimization

SIAM Member Rates

\$40.00/year (domestic) \$43.00/year (foreign)

Non-member Rates

\$150.00/year (domestic) \$175.00/year (foreign)

Prices are in U.S. dollars.

A list of Editorial Board members is available upon request.

To contribute a paper to *SIAM Journal on Optimization*, send submissions to:

SIAM Publications, Attn. John E. Dennis, Jr.,
 Box 7541, Philadelphia, PA 19101 U.S.A.

To subscribe to *SIAM Journal on Optimization*, please contact:

SIAM Customer Service, 3600 University
 City Science Center, Philadelphia, PA 19104

Contents / February 1991 / Volume 1, Number 1

Variable Metric Method for Minimization

William C. Davidson

A New Variational Result for Quasi-Newton Formulae

Roger Fletcher

On the Performance of Karmarkar's Algorithm Over a Sequence of Iterations

Kurt M. Anstreicher

Composite Nonsmooth Programming with Gâteaux Differentiability

V. Jeyakumar

Local and Superlinear Convergence for Partially Known Quasi-Newton Methods

John R. Engels and Héctor J. Martínez

Minimization of Locally Lipschitzian Functions

Jong-Shi Pang, Shih-Ping Han, and Narayan Rangaraj

A Polynomial-Time Predictor-Corrector Algorithm for a Class of Linear Complementarity Problems

Jiu Ding and Tien-Yien Li

A New Proof of Superlinear Convergence for Broyden's Method in Hilbert Space

C. T. Kelley and Ekkehard W. Sachs

On the Solution of Large

Quadratic Programming Problems with Bound Constraints

Jorge J. Moré and Gerardo Toraldo

Convergence of Iterates of an Inexact Matrix Splitting Algorithm for the Symmetric Monotone Linear Complementarity Problem

O. L. Mangasarian

On the Convergence of the Multidirectional Search Algorithm

Virginia Torczon

siam®

HOTEL RESERVATION FORM

SIAM CONFERENCE ON PARALLEL PROCESSING

MARCH 25-27, 1991

WESTIN GALLERIA AND WESTIN OAKS HOTELS
HOUSTON, TX

PLEASE SEND ME A CONFIRMATION NOTICE

Specially discounted rooms are being held for our exclusive use until March 8, 1991. After that date reservations will depend on availability. Your reservation is not confirmed until acknowledged in writing by the hotel or verified by phone. When making reservations by phone, be certain to identify yourself as an attendee at the SIAM Conference on Parallel Processing. Telephone: 1-713-960-8100

Name _____ Phone _____

Address _____
First Last

City _____ State _____ Zip _____

Please reserve ☐ Single \$85 ☐ Double \$105 Arrival Date _____

Arrival Time _____ Departure Date _____

I will share a room with _____

I am a ☐ Smoker ☐ Non-smoker

I need a double room with ☐ one double bed ☐ two double beds

To make reservation you must include deposit in the amount of first night's room rate.

I choose to pay by: * ☐ AMEX ☐ VISA ☐ MC ☐ Check

Credit Card Number _____ Expiration Date _____ Deposit \$ _____ (Late Arrivals Only)

Signature _____

* Please enclose this form in an envelope and mail to:

Reservations: Westin Galleria Hotel, 5060 West Alabama, Houston, TX 77506

ADVANCE REGISTRATION FORM

SIAM CONFERENCE ON PARALLEL PROCESSING

March 25-27, 1991

Westin Galleria and Westin Oaks Hotels, Houston, TX

Advance registration form must be received at the SIAM office by March 18, 1991. If paying by check, please make check payable to SIAM.

REGISTRATION FEES:

		SIAG/ SC **	SIAM Member	Non- Member	Student
Tutorial	Advance	\$115	\$115	\$135	\$55
	On-Site	\$135	\$135	\$155	\$75
Conference*	Advance	\$145	\$150	\$180	\$50
	On-Site	\$175	\$180	\$220	\$50

Registration Fee:

Tutorial	\$ _____	\$ _____	\$ _____	\$ _____
Conference	\$ _____	\$ _____	\$ _____	\$ _____
Total	\$ _____	\$ _____	\$ _____	\$ _____

* Conference fee includes a copy of the proceedings to be published in early 1992.

** Members of SIAM Activity Group on Supercomputing

Please Print

Name _____
First Last

Organization _____

Department _____

Address _____

City _____ State _____ Zip _____

Telephone Number _____

Local Address in Houston _____

I wish to pay by ☐ AMEX ☐ VISA ☐ MC ☐ Check

Credit Card Number _____

Expiration Date _____

Signature _____

Detach form and enclose with payment in the envelope provided (domestic mail only), or mail to: SIAM, 3600 University City, Science Center, Philadelphia, PA 19104-2688. Telephone: (215) 382-9800
FAX: (215) 386-7999; E-Mail: siamconfs@wharton.upenn.edu

To: **RESERVATIONS**
Westin Galleria and Westin Oaks Hotels
5060 West Alabama
Houston, TX 77056

SIAM
6th Floor
3600 University City Science Center
Philadelphia, PA 19104-2688
U.S.A.

Nonprofit Org.
U. S. Postage
PAID
Permit No. 2609
Phila. PA

POSTMASTER PLEASE DELIVER TO: