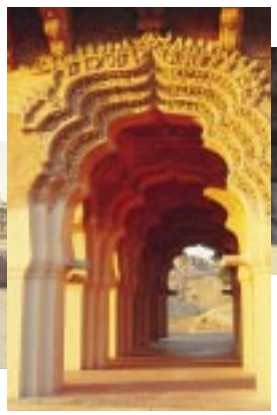
7th International Conference on High Performance Computing




December 17-20, 2000

Bangalore, India

www.hipc.org

Advance Program

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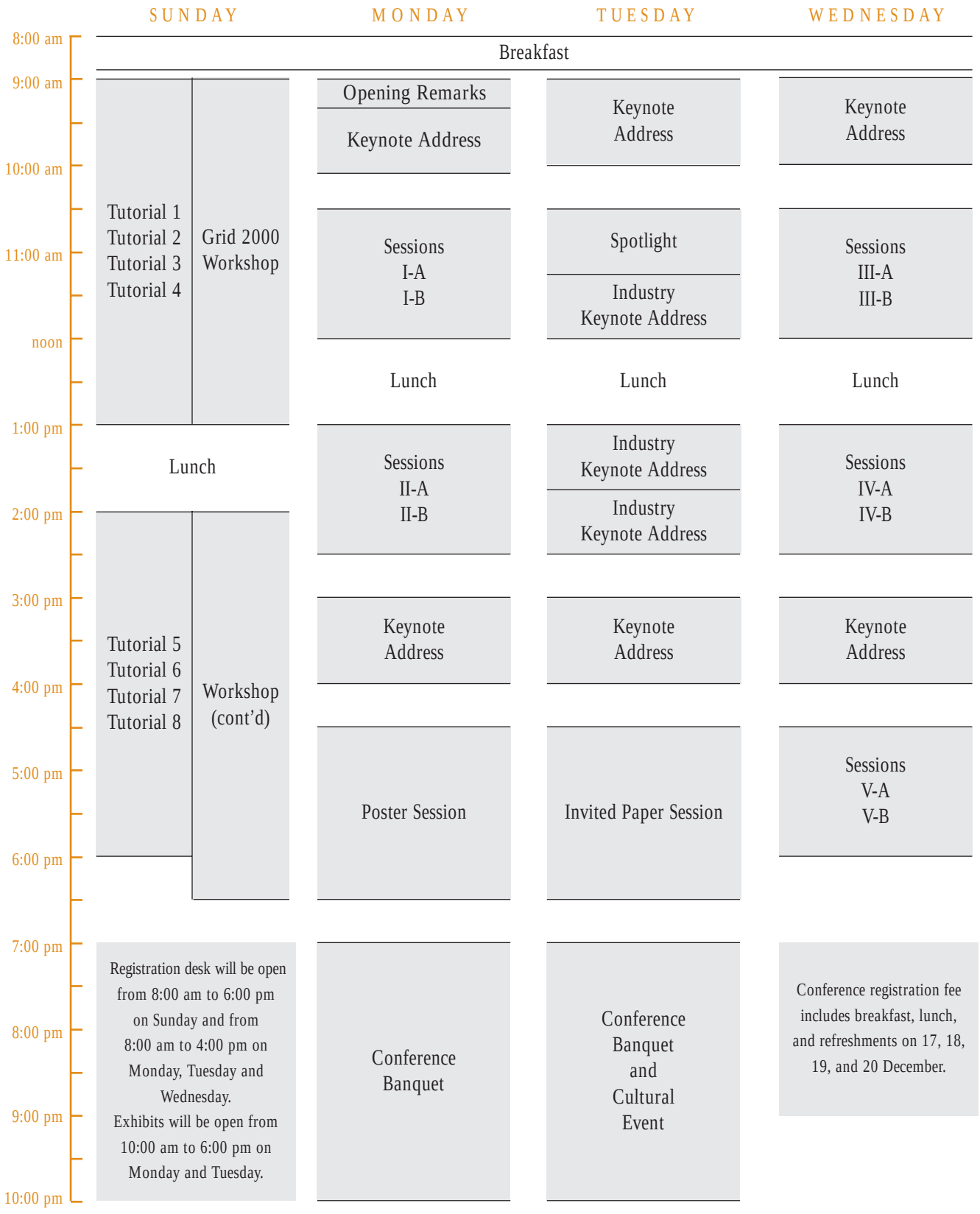
Gautam Das, Microsoft Research and Mohammad Zaki, Rennsalaer Polytechnic Institute
Large-Scale Data Mining

Partha Dasgupta and Sethuraman Panchanathan, Arizona State University
Applied Parallel Processing

Shikaresh Majumdar, Carleton University and Gabriel Kotsis, University of Vienna, Austria
High Performance Middleware

Hee Yong Youn, Information and Communication University, South Korea
Cluster Computing and its Applications

SCHEDULE


SUNDAY
MONDAY
TUESDAY
WEDNESDAY
8:00 am
9:00 am
10:00 am
11:00 am
noon
1:00 pm
2:00 pm
3:00 pm
4:00 pm
5:00 pm
6:00 pm
7:00 pm
8:00 pm
9:00 pm
10:00 pm
Breakfast
Tutorial 1
Tutorial 2
Tutorial 3
Tutorial 4
Grid 2000 Workshop
Lunch
Tutorial 5
Tutorial 6
Tutorial 7
Tutorial 8
Workshop (cont'd)
Registration desk will be open from 8:00 am to 6:00 pm on Sunday and from 8:00 am to 4:00 pm on Monday, Tuesday and Wednesday.
Exhibits will be open from 10:00 am to 6:00 pm on Monday and Tuesday.
Opening Remarks
Keynote Address
Sessions I-A I-B
Lunch
Sessions II-A II-B
Keynote Address
Poster Session
Conference Banquet
Keynote Address
Spotlight
Industry Keynote Address
Lunch
Industry Keynote Address
Industry Keynote Address
Keynote Address
Invited Paper Session
Conference Banquet and Cultural Event
Keynote Address
Sessions III-A III-B
Lunch
Sessions IV-A IV-B
Keynote Address
Sessions V-A V-B
Conference registration fee includes breakfast, lunch, and refreshments on 17, 18, 19, and 20 December.

OVERVIEW

KEYNOTE SPEAKERS

James R Goodman
University of Wisconsin, Madison
"2001: A Space, Power, and Performance Odyssey"

William Gropp
Argonne National Laboratory
"Whither MPI: Lessons From and Future of MPI"

Robert Hollebeek
University of Pennsylvania
"Data from Far and Wide: Finding IT, Managing IT, Using IT"

Bob Rau
Hewlett Packard Labs
"Embedded Computing: New Challenges for Computer Architecture"

Daniel Reed
University of Illinois, Urbana-Champaign
"Market Driven High-Performance Computing"

Hans P. Zima
University of Vienna
"Programming and Execution Models for Processor-in-Memory Arrays"

INDUSTRY KEYNOTE SPEAKERS

Anant Agrawal
Vice President, Sun Microsystems
(Topic to be announced)

Frank Baetke
Hewlett Packard, Germany
"HP's High Performance Computing Strategy"

Datta Subramanya
Head - Telecom Business, Digital India
"Achieving Scalability on the Internet"

BANQUET SPEAKERS

Nikil Jayant
Georgia Research Alliance Eminent Scholar

N.R. Narayana Murthy
Chairman, Infosys

CONTRIBUTED PAPERS

There will be 46 contributed papers from 12 countries, chosen from 127 papers submitted in response to the call for papers. Contributed papers will be presented in 10 sessions.

INVITED PAPERS

Leading computer architects will share their visions for future processors through invited papers to be presented in a plenary session titled "Future General-Purpose and Embedded Processors".

Organizers
Sriram Vajapeyam
Indian Institute of Science

Mateo Valero
Technical University of Catalonia

Speakers
Trevor N. Mudge
University of Michigan, Ann Arbor

Bob Rau
Hewlett-Packard Labs

James E. Smith
University of Wisconsin, Madison

Gurindar S. Sohi
University of Wisconsin, Madison

TUTORIALS

Opportunities and Challenges in Computational Biology
Srinivas Aluru, Iowa State University

Basics of Web Mining
Raghu Krishnapuram, IBM Solutions Research Centre

Real Time Voice over IP
Anurag Kumar, Indian Institute of Science, Bangalore

Security aspects on the Internet - with emphasis on Cryptography
H.K. Narahari, Digital Equipment (India) Ltd

Network-Based Computing: Current Trends, Challenges, and the Future
Dhabaleswar K. Panda, The Ohio State University

Weaving the Semantic Web: Mining Hypertext and Semistructured Databases
Soumen Chakrabarti, Indian Institute of Technology, Bombay

Java VM Infrastructure for High-Performance Server-Side Java
Suresh Srinivas, SGI

Mobility Management in Dynamic Networks
Subir Das, Anthony McAuley, and Archan Misra, Telcordia Technologies

WORKSHOP

Grid 2000, the International Workshop on Grid Computing will be held on December 17. There will be 17 papers from 15 countries.

Keynote Speaker
Wolfgang Gentzsch
Chairman & Chief Technology Officer,
Gridware Inc., USA/Germany
"DOT-COMing the GRID"

POSTER/PRESENTATION SESSION

In addition to parallel sessions of contributed papers, a plenary poster/presentation session emphasizing novel applications of high performance computing will be held on Tuesday, 19 December. It will offer a brief presentation time for each poster followed by a walk-up and talk setting.

For details, contact:
Sartaj Sahni
Department of Computer and Information Science
CSE 301, University of Florida
Gainsville, FL 32611, USA
Email: sahni@cise.ufl.edu

EXHIBITS & ORGANIZATION/ COMPANY PRESENTATIONS

Academic institutions, R&D labs, and Companies are encouraged to use stalls available at the meeting to display exhibits and/or to make informal poster presentations about their research projects, products/product roadmaps, research and development opportunities, etc. Each participant organization/ company will be provided a spotlight time in a plenary session for highlighting their stall.

EXHIBIT CHAIR

R. Govindarajan
Supercomputer Education and Research Centre
Computer Science and Automation
Indian Institute of Science
Bangalore - 560 012, INDIA
Tel: +91 (80) 309 2794 or +91 (80) 334 6654
Fax: +91 (80) 334 6648
Internet: govind@serc.iisc.ernet.in

SUNDAY, DEC. 17

WORKSHOP

The 2000 International Workshop on Grid Computing (GRID 2000)
http://www.gridcomputing.org

GRID 2000 Sponsors and Supporting Organisations:
· Association for Computing Machinery (ACM) SIGARCH
· IEEE Task Force on Cluster Computing
· EuroTools SIG on Metacomputing
· European Grid Forum (eGRID)
· Centre for Development of Advanced Computing
· Gridware Inc.
· Microsoft Research

Workshop Co-Chairs:
Rajkumar Buyya, Monash University
Mark Baker, University of Portsmouth

9:00 am - 9:10 am

OPENING REMARKS

Rajkumar Buyya
Mark Baker

9:10 am - 10:30 am

SESSION I

Keynote and Invited Paper Session
Co-chairs: Rajkumar Buyya and Mark Baker

KEYNOTE ADDRESS

"DOT-COMing the GRID"
Wolfgang Gentzsch, Chairman & Chief Technology Officer, Gridware Inc.

INVITED PAPER PRESENTATION

"Design issues of Network Enabled Server Systems for the Grid"
Satoshi Matsuoka, Tokyo Institute of Technology, Japan, Mitsuhisa Sato, Real World Parallel Computing, Hidemoto Nakada, Tokyo Institute of Technology, and Satoshi Sekiguchi, Electrotechnical Laboratory

11:00 am - 1:00 pm

SESSION II

Grid Resource Management
Chair: Domenico Laforenza
CNUCE - Institute of the Italian National Research Council

Architectural Models for Resource Management in the Grid
Rajkumar Buyya, Monash University, Steve Chapin, Syracuse University, and David DiNucci, elepar.com

An Open Market-Based Framework for Distributed Computing over the Internet
Spyros Lalis and Alexandros Karipidis, University of Crete and FORTH

MeSch - An Approach to Resource Management in a Distributed Environment
Gerd Quecke and Wolfgang Ziegler, GMD - German National Research Centre for Information Technology

Resource Management Method for Cooperative Web Computing on Computational Grid
Hye-Seon Maeng, Tack-Don Han, and Shin-Dug Kim, Yonsei University

Architecture for a Grid Operating System
Klaus Krauter and Muthucumaru Maheswaran, University of Manitoba

Data Management in an International Data Grid Project
Wolfgang Hoschek, CERN - European Organization for Nuclear Research and University of Linz, Javier Jaen-Martinez, CERN, Asad Samar, CERN and California Institute of Technology, Heinz Stockinger, and Kurt Stockinger, CERN and University of Vienna

SUNDAY, DEC. 17

2.00 pm - 4.00 pm

SESSION III

Grid Middleware and Problem Solving Environments

Chair: Muthucumaru Maheswaran
University of Manitoba

XtremWeb: Building an Experimental Platform for Global Computing
Cecile Germain, Vincent Neri, Gille Fedak and Franck Cappello, Universite Paris-Sud

A Grid Computing Environment for Enabling Large Scale Quantum Mechanical Simulations
Jack J. Dongarra and Padma Raghavan, University of Tennessee

A Web-based Metacomputing Problem Solving Environment for Complex Applications
Ranieri Baraglia, Domenico Laforenza, CNUCE - Institute of the Italian National Research Council, and Antonio Lagana, University of Perugia

FOCALE: Towards a Grid View of Large-Scale Computation Components
G. Scotto di Apollonia, C. Gransart, and J.M. Geib, University of Science and Technology of Lillee

Web Enabled Client-server Model for Development Environment of Distributed Image Processing
Haresh S. Bhatt, V.H. Patel, Space Applications Centre, Ahmedabad, and A.K. Aggarwal, Gujarat University

An Advanced User Interface Approach for Complex Parameter Study Process Specification on the Information Power Grid
Maurice Yarrow, Karen McCann, Rupak Biswas, and Rob F. Van der Wijngaart, NASA Ames Research Center

4:20 pm - 5:15 pm

SESSION IV

Grid Test-Beds and Resource Discovery

Chair: Wolfgang Gentzsch
GRIDware Inc.

Mini-Grids: Effective Test-beds for Grid Application
John Brooke, Martyn Foster, Stephen Pickles, Keith Taylor, and Terry Hewitt, University of Manchester

Configuration Method of Multiple Clusters for the Computational Grid
Pil-Sup Shin, Won-Kee Hong, and Shin-Dug Kim, Yonsei University

A Parameter-based Approach to Resource Discovery in Grid Computing Systems
Muthucumaru Maheswaran and Klaus Krauter, University of Manitoba

5:15 pm - 6:30 pm

SESSION V

Application Level Scheduling on the Grid

Chair: Rajkumar Buyya
Monash University

Evaluation of Job-Scheduling Strategies for Grid Computing
Volker Hamscher, Uwe Schwiegelshohn, University of Dortmund, Achim Streit, University of Paderborn, and Ramin Yahyapour, University of Dortmund

Experiments with Migration of Message-Passing Tasks
K. Iskra, Z. Hendrikse, G. van Albada, B. Overeinder, P. Sloot, University of Amsterdam, and J.Gehring, Paderborn Centre for Parallel Computing

Adaptive Scheduling for Master-Worker Applications on the Computational Grid
Elisa Heymann, Miquel A. Senar, Emilio Luque, Autonomous University of Barcelona, and Miron Livny, University of Wisconsin-Madison

An Agent Based Dynamic Load Balancing System
Ashok Rajagopalan and Salim Hariri, University of Arizona

SUNDAY, DEC. 17

9:00 am - 1:00 pm

TUTORIAL 1

Opportunities and Challenges in Computational Biology

Srinivas Aluru
Iowa State University

Audience: This tutorial is intended for computer professionals, software developers, researchers, educators and graduate students interested in conducting research or developing software systems in computational biology.

Course Description: Computational biology is fast emerging as a major thrust area for academic research and industrial application in the 21st century. With the aid of computer science, molecular biology is on its course for future discoveries unrivaled in significance such as the treatment of diseases by altering the genetic code and the design of proteins to facilitate better administration of drugs. The goal of this tutorial is to provide a comprehensive introduction to the field of computational biology to audience with computing background, interested in participating in research and/or commercial applications of this field. The tutorial will introduce the audience to the major subareas in computational biology including sequence alignments, mapping, fragment assembly, protein folding and evolutionary trees. Fundamental data structures and techniques useful in sequence processing will be introduced. Current progress on genome-scale projects will be discussed and information on resources available on the internet including genomic and protein databases and software tools will be provided. Potential applications of high performance computing to computational biology will be highlighted. For researchers and graduate students, several important open problems will be discussed. For the software professional, opportunities for development of software systems and problem solving environments will be discussed. No background in biology is assumed.

Lecturer: Srinivas Aluru is a faculty member in the Dept. of Electrical and Computer Engg. and the Lawrence H. Baker Center for Bioinformatics and Biological Statistics at Iowa State University. He also serves as a faculty on the interdisciplinary Bioinformatics and Computational Biology graduate program at Iowa State University. Prof. Aluru received his B. Tech degree in Computer Science from the Indian Institute of Technology, Madras, India, in 1989 and his M.S. and Ph.D. degrees in Computer Science from Iowa State University, USA, in 1991 and 1994, respectively. He worked as an Assistant Professor in the Dept. of Computer Science at New Mexico State University from 1996 to 1999 and as a Visiting Assistant Professor in the School of Computer and Information Science at Syracuse University from 1994 to 1996. His research interests include parallel algorithms and applications, computational biology and scientific computing. His research has been funded by the National Science Foundation, US Army and US Department of Energy. He is a recipient of the NSF CAREER Award.

9:00 am - 1:00 pm

TUTORIAL 2

Basics of Web Mining

Raghu Krishnapuram
IBM Solutions Research Centre

Audience: This introductory tutorial is meant for researchers and graduate students interested in Web mining, document classification and pattern analysis. Some basic background in probability and statistics, linear algebra, and optimization techniques would be helpful. An effort will be made to make the tutorial accessible to computer professionals.

Course Description: The proliferation of information on the World Wide Web has made personalization of this information space a necessity. Web personalization/mining has two components: (1) tailoring the content delivered to the user from a Web site; and (2) exploring the available Web objects such as URLs, Web pages, and snippets, and categorizing them. Mining typical user profiles from access logs is an important component of Web personalization. Similarly, clustering Web documents into groups of related items is required in many applications of Web mining. The algorithms for Web personalization and mining need to be scalable, robust (so that they can deal with outlier data), incremental (since all data may not be available at one time), and fuzzy (since categories are rarely crisp in practice). Moreover, certain types of Web objects (such as URLs) cannot be represented by numerical features, and therefore suitable similariy measures need to be defined. This tutorial will review various approaches that deal with the above-mentioned aspects of Web mining.

Lecturer: Raghu Krishnapuram ("http://www.mines. edu/fs_home/rkrishna/") received his Ph.D. degree from Carnegie Mellon University in 1987. He has held academic positions at the University of Missouri, Columbia, and at the Colorado School of Mines, Golden, Colorado. Currently he is a research staff member at IBM India Research Lab. In 1993, Dr. Krishnapuram was at the European Laboratory for Intelligent Techniques Engineering, Aachen, Germany, as a Humboldt Fellow. He is an associate editor of the IEEE Transactions on Fuzzy Systems, and an area editor for the journal Fuzzy Sets and Systems. He is a co-author of the book"Fuzzy Models and Algorithms for Pattern Recognition and Image Processing," Kluwer Press, 1999. Dr. Krishnapuram's research encompasses many aspects of Web mining, content-based image retrieval, fuzzy set theory, pattern recognition, and computer vision.

SUNDAY, DEC. 17

9:00 am - 1:00 pm

TUTORIAL 3

Real Time Voice over IP

Anurag Kumar
Indian Institute of Science

Audience: This tutorial is targeted at networking professionals and engineering students (final year BE or beyond), who have a good understanding of Internet networking concepts.

Course Description: Motivation for packet telephony; quick overview of speech coding and voice activity detection standards; variable bit rate (VBR) speech; hangover; on-off model for VBR speech; desired quality of service (QoS) for such speech; transporting packetised VBR voice in a packet network, associated problems, and their mitigation; packet recovery techniques (FEC and packet repetition); fixed and variable packet delays; effects of delay jitter; playout delay; loss concealment; sequence numbering; reconstruction of synchronous speech from asynchronous packet arrivals; use of time stamps; adaptive playout techniques; implementation issues; QoS techniques: traffic shaping, resource reservation; associated concepts and techniques and their application to packet telephony; packet telephony protocols and standards RTP, UDP, H.323, MGCP, SIP, RSVP.

Lecturer: Anurag Kumar obtained his B. Tech. degree in Electrical Engineering, in 1977, from the Indian Institute of Technology at Kanpur, and the Ph.D. degree in 1981 from Cornell University. He was then with Bell Laboratories, Holmdel, N.J., for over 6 years. Since 1988 he has been with the Indian Institute of Science (IISc), Bangalore, in the Dept. of Electrical Communication Engineering, where he is now a Professor. He is also the Coordinator at IISc of the Education and Research Network Project (ERNET). His area of research is Communication Networking; specifically, modelling, analysis, control and optimization problems arising in communication networks and distributed systems. Recently, he has been conducting analytical and experimental research in traffic modelling, traffic engineering, and quality of service techniques in the context of the Internet. He is a Fellow of the Indian National Academy of Engineering.

9:00 am - 1:00 pm

TUTORIAL 4

Security aspects on the Internet - with emphasis on Cryptography

H.K. Narahari
Digital Equipment (India) Ltd.

Audience: This tutorial is intended for computer professionals, researchers, educators, and graduate students interested in the security aspects of doing business on the Internet.

Course Description: Internet revolution has dramatically changed the way business is done adding to the problems of Security. Large corporations or small business houses, in order to survive on the net, have to provide easy information access to their customers. This throws up a variety of problems related to identification, authentication and differentiation between bonafide and malafide customers. In a multiply connected world, ensuring confidentiality and integrity of data is a major problem area. Processes and systems have to be chosen carefully as a trade-off between end-user simplicity and security.

Cryptography or the science of coded messages provides some answers and tools which can help alleviate the problems related to data security. This tutorial gives a brief introduction to this branch of science tracing the development and highlighting the numerous options that are available.

Topics covered include : 1) Security issues involved in doing business over the Internet, 2) Options available through h/w and s/w, 3) Cryptography as a tool; Overview of encryption and decryption; Highlights of various encryption methodologies DES & RSA, 4) Implementation on the net etc., 5) Threats scenarios Passive and active use of parallel computing to hack/ break systems, and 6) Status as of now and future.

Lecturer: H.K Narahari is at present the Business Operations Manager at Digital Equipment (India) Ltd. He received his D.M.I.T degree in 1975 from the Madras Institute Of Technology, the ME degree in 1977 from the Indian Institute of Science at Bangalore, and the Ph.D. degree in 1986 from the same institute. Dr. Narahari has worked extensively on the application of Computational Fluid Dynamics tools to Aerospace problems and has several papers and reports to his credit. His current research interests include High Performance Computing, Parallel algorithms, Performance optimization and Cryptographic implementations.

SUNDAY, DEC. 17

2:00 pm - 6:00 pm

TUTORIAL 5

Network-Based Computing (NBC): Current Trend, Challenges, and the Future

Dhabaleswar K. Panda
The Ohio State University

Audience: This tutorial is intended for scientists, engineers, researchers, professors, and students working on the design and development of next generation NBC systems; and managers and IT professionals responsible for setting-up NBC systems and facilities.

Course Description: The current decade is seeing rapid growths along three major directions: 1) low-cost and commodity workstations/PCs, 2) commodity networking technologies, and 3) web technology. This trend is leading us to a new "Network-Based Computing" (NBC) paradigm. This tutorial will provide an in-depth look at this emerging trend. Driving NBC applications from different areas (such as databases, multimedia, tele-medicine, visualization, collaborative computing, meta-computing, electronic commerce, and virtual reality) will be presented. Three categories of NBC system architecture will be introduced. Basic research issues (such as networking, fast communication, programming environments, security, QoS, and interfacing) in designing NBC systems will be investigated. Suitability of current networking technologies (Gigabit Ethernet, ATM, and Myrinet) for designing scalable NBC systems will be analyzed. Challenges in designing future NBC systems with the availability of terabit networks, large clusters/SMP systems, and Internet II will be discussed.

Lecturer: Dhabaleswar K. Panda is an Associate Professor of Computer Science at the Ohio State University. He obtained his B.Tech from IIT, Kanpur; M.E. from IISc, Bangalore; and Ph.D. from the University of Southern California. His research interests include parallel computer architecture, network-based computing, and interprocessor communication. He has published over 80 papers in major journals and international conferences. Dr. Panda has served on Program Committees and Organizing Committees of several conferences. Currently, he is serving as a General Co-chair for the 2001 ICPP conference, an Associate Editor of the IEEE TPDS journal, an IEEE Distinguished Visitor Speaker, and an IEEE Chapters Tutorials Program Speaker. Dr. Panda is a recipient of the NSF CAREER Award, the OSU Lumley Research Award, and an Ameritech Faculty Fellow Award. Dr. Panda is listed as a distinguished scientist in "Who'sWho in America" and in "American Men & Women of Science".

2:00 pm - 6:00 pm

TUTORIAL 6

Weaving the Semantic Web: Mining Hypertext and Semistructured Databases

Soumen Chakrabarti
Indian Institute of Technology, Bombay

Audience: This tutorial is targetted towards researchers and graduate students interested in databases, data mining, and hypertext. Some background in elementary probability and relational data models will be helpful. Efforts will be made to make the tutorial accessible to computer professionals.

Course Description: With over a billion pages covering most areas of human endeavor, the World-wide Web is a fertile ground for data mining research to make a difference to the effectiveness of information search. Today, Web surfers access the Web through two dominant interfaces: clicking on hyperlinks and searching via keyword queries. This process is often tentative and unsatisfactory. Better support is needed for expressing one's information need and dealing with a search result in more structured ways than what is available now. Data mining and machine learning have significant roles to play towards this end. In this tutorial, we will survey recent advances in learning and mining problems related to hypertext, in general and the Web, in particular. We will review the continuum of supervised to semi-supervised to unsupervised learning problems, highlight the specific challenges which distinguish data mining in the hypertext domain from data mining in the context of data warehouses, and summarize the key areas of recent and ongoing research.

Lecturer: Soumen Chakrabarti ("http://www.cse.iitb.ernet.in/~soumen/") received his B.Tech in Computer Science from the Indian Institute of Technology, Kharagpur, and his M.S. and Ph.D. in Computer Science from the University of California, Berkeley. He was a Research Staff Member at IBM Almaden Research Center. He is currently an Assistant Professor in the Department of Computer Science and Engineering at the Indian Institute of Technology, Bombay. His research interests include hypertext information retrieval, web analysis and data mining. He designed the Focused Crawler ("http://www.cs.berkeley.edu/ ~soumen/focus") and the Clever ("http://www.almaden.ibm.com/cs/k53/clever.html") search engine, filing several patents in the process. His work on focused crawling got the Best Paper award at the International World Wide Web Conference. He has served on Program Committees of several conferences.

SUNDAY, DEC. 17

2:00 pm - 6:00 pm

TUTORIAL 7

Java VM Infrastructure for High-Performance Server-Side Java

Suresh Srinivas
SGI

Audience: This tutorial is intended for developers of high-performance Java software on the Server Side. Implementors of Java will also find it useful. It is primarily geared towards people who already are very fluent in Java and wish to understand what goes on under the hood. This is not an introductory tutorial and is not suitable for individuals learning Java as their first programming language.

Course Description: This tutorial will discuss the underlying infrastructure inside Java Virtual Machines such as Garbage Collection mechanisms, performance issues for multithreaded applications, compilation models for Java, and developing multi-language Java applications. It will focus on these mechanisms from the point of view of developing and deploying Java on the server-side. It will be structured into 4 parts for a 1/2 day (4 hr) tutorial.

Part 1: Compilation Models for Java (1 hr) Interpretation, Just-In-Time compilation and native Ahead-Of-Time compilation.
Part 2: Multilanguage Java Programming (1 hr) Options available for developing multi-language Java applications, Java Native Interface, Performance issues for Multilanguage Java applications.
Part 3: Multithreading in Java (1 hr) Mapping of Java threads to OS threads, Scaling of threads, Synchronization/Locking.
Part 4: Garbage Collection issues (1 hr) What to expect from your Garbage Collector? Some discussion on GC mechanisms in current production JVM's (Classic JVM, HotSpot/IBM JVM, gcj).

Lecturer: Suresh Srinivas, is engineering manager of the Java Compiler Group at Silicon Graphics. He received his Ph.D. from Indiana University, specializing in parallel computing while working in the Extreme Computing Group. He joined the SGI Compiler and Tools Group and worked on performance tools, Java MIPS JIT compiler, and other Java VM porting and tuning issues. He is passionate about computer languages and their implementation, and has worked on a variety of language systems, such as Java, C++, pC++, Scheme, and Emacs/elisp. He currently teaches an advanced Java course at UC Berkeley Extension titled "Advanced Java: Language, Internals, and Techniques".

2:00 pm - 6:00 pm

TUTORIAL 8

Mobility Management in Dynamic Networks

Subir Das, Anthony McAuley, and Archan Misra, Telcordia Technologies

Audience: The tutorial is intended for networking researchers, designers, engineers, educators and graduate students who are interested in getting insights into future dynamic networks. Those working outside this area can get a high level overview of this rapidly changing field. It is also intended for network providers who are building future 3rd and 4th generation wireless IP networks.

Course Description: To provide heterogeneity and flexibility, future dynamic networks will not only use IP for routing, but also for user-network signaling. For example, 3rd generation wireless networks will use IP for functions such as configuration, registration, service negotiation and mobility management. Support for mobile operations, the key strength of a wireless network, requires the network to not only track the current location of nodes, but also provide continuous connectivity while roaming. Different mobility schemes have different characteristics in terms of latency, security, flexibility, number of addresses, and robustness. An overall solution requires deep understanding of existing state-of-the-art solutions, as well as their merits and de-merits. Clearly well-known solutions, such as Mobile IP and SIP, will play a key part in any overall IP mobility solution. For dynamic networks, however, there are several issues that need further investigation.

While the first part of this tutorial gives a brief overview of IP in dynamic networks, configuration and registration protocols and routing for dynamic networks, the second part provides an in-depth description of mobility management schemes for various types of networks and shows how several representative applications and network characteristics dictate the correct choice of mobility management scheme.

Lecturer: Subir Das is a Research Scientist in the Wireless IP networking research department, Telcordia Technologies, Morristown, NJ. He received his Ph.D. in Computer Engineering from E & ECE Department, IIT, Kharagpur. From 1997-99, Dr. Das was a faculty member in the same Department. His current research interests include mobility management in 3G wireless access systems, wireless multimedia, security in next generation networks, auto-configuration of adhoc, mobile networks. Anthony Mcauley received his Ph.D. from Hull University, England in 1985. He worked as a research fellow in Caltech form 1985-1987. Since 1987 he has been at Telcorida Technologies and is currently a Director in the Wireless IP Networking Research group. His current research projects include protocols for complete network auto-configuration and architectures and protocols for 3rd generation IP wireless and home networking systems. Archan Misra is a Research Scientist in the Wireless IP OSS department in the Applied Research division of Telcordia Technologies. He received his Ph.D. in Electrical Engineering from the University of Maryland at College Park. Archan's primary interests are in the design and provisioning of methodologies/architectures for supporting QoS guarantees on the Internet and in the development of mobility management solutions for IP and telecommunications networks.

MONDAY, DEC. 18

9:00 am - 9:10 am

OPENING REMARKS

Viktor K. Prasanna
Sriram Vajapeyam
Mateo Valero

9:10 am - 10:10 am

KEYNOTE ADDRESS

"Market Driven High-Performance Computing"
Dan Reed
University of Illinois, Urbana-Champaign

10:30 am - noon

SESSION I-A

Systems Software
Chair: Wei Hsu
University of Minnesota

Charon Message-Passing Toolkit for Scientific Computations
Rob F. Van der Wijngaart, NASA Ames Research Center

Dynamic Slicing of Concurrent Programs
D. Goswami and R. Mall, Indian Institute of Technology, Kharagpur

An Efficient Run-Time Scheme for Exploiting Parallelism on Multiprocessor Systems
Tsung-Chuan Huang, National Sun Yat-sen University, Po-Hsueh Hsu, Cheng Shiu Institute of Technology, Chi-Fan Wu, National Sun Yat-sen University

Characterization and Enhancement of Static Mapping Heuristics for Heterogeneous Systems
Praveen Holenarsipur, Vladimir Yarmolenko, Jose Duato, Dhabaleswar K Panda, P Sadayappan, The Ohio State University

10:30 am - noon

SESSION I-B

Algorithms
Chair: Assaf Schuster
Israel Institute of Technology, Technion

Optimal Segmented Scan and Simulation of Reconfigurable Architectures on Fixed Connection Networks
Alan A. Bertossi and Alessandro Mei, University of Trento

Reducing False Causality in Causal Message Ordering
Pranav Gambhire and Ajay Kshemkalyani, University of Illinois at Chicago

The Working-set Based Adaptive Protocol for Software Distributed Shared Memory
Sung-Woo Lee and Kee-Young Yoo, Kyungpook University

Evaluation of the Optimal Causal Message Ordering Algorithm
Pranav Gambhire and Ajay Kshemkalyani, University of Illinois at Chicago

Register Efficient Merge-sorting
Abhiram Ranade, Sonal Sancheti, Raghavendra Udupa, Indian Institute of Technology, Bombay

MONDAY, DEC. 18

1:00 pm - 2:30 pm

SESSION II-A

High-Performance Middleware

Co-Chairs: Shikaresh Majumdar, Carleton University and Gabriel Kotsis University of Vienna

Applying Patterns to Improve the Performance of Fault Tolerant CORBA
Balachandran Natrajan, Washington University, Anirudha Gokhale, Bell Laboratories, Shalini Yajnik, Bell Laboratories/Lucent Technologies, Douglas C. Schmidt, University of California, Irvine

Design, Implementation and Performance Evaluation of a High Performance CORBA Group Membership Protocol
Shivakant Mishra and Xiao Lin, University of Wyoming

Analyzing the Behavior of Event Dispatching Systems Through Simulation
G. Bricconi, CEFRIEL, E. Di Nitto, A. Fuggetta, Politecnico di Milano, E. Tracanella, CEFRIEL

ParAgent: a Domain-Specific Automatic Parallelization Tool
S. Mitra, S.C. Kothari, J. Cho, and A. Krishnamurthy, Iowa State University

Practical Experience with Approaches to Java Compilation
Todd Smith and Suresh Srinivas, Silicon Graphics Inc.

1:00 pm - 2:30 pm

SESSION II-B

Applications

Chair: C.P. Ravikumar
Indian Institute of Technology, Delhi

Performance Prediction and Analysis of Parallel Out-of-Core Matrix Factorization
Eddy Caron, Dominique Lazure, and Gil Utard, Universite de Picardie Jules Verne

Integration of Task and Data Parallelism: A Coordination-based Approach
M. Díaz, B. Rubio, E. Soler, J.M. Troya, University of Malaga

Parallel and Distributed Computational Fluid Dynamics: Experimental Results and Challenges
M.J. Djomehri, R. Biswas, R.F. Van der Wijngaart, M. Yarrow, NASA Ames Research Center

Parallel Congruent Regions on a Mesh-connected Computer
Chang-Sung Jeong, Sung-Up Cho and Sun-Mi Kim, Korea University

Can Scatter Communication Take Advantage of Multidestination Message Passing?
Mohammad Banikazemi and Dhabaleswar K. Panda, The Ohio State University

3:00 pm - 4:00 pm

KEYNOTE ADDRESS

"Data from Far and Wide: Finding IT, Managing IT, Using IT"

Robert Hollebeek
University of Pennsylvania

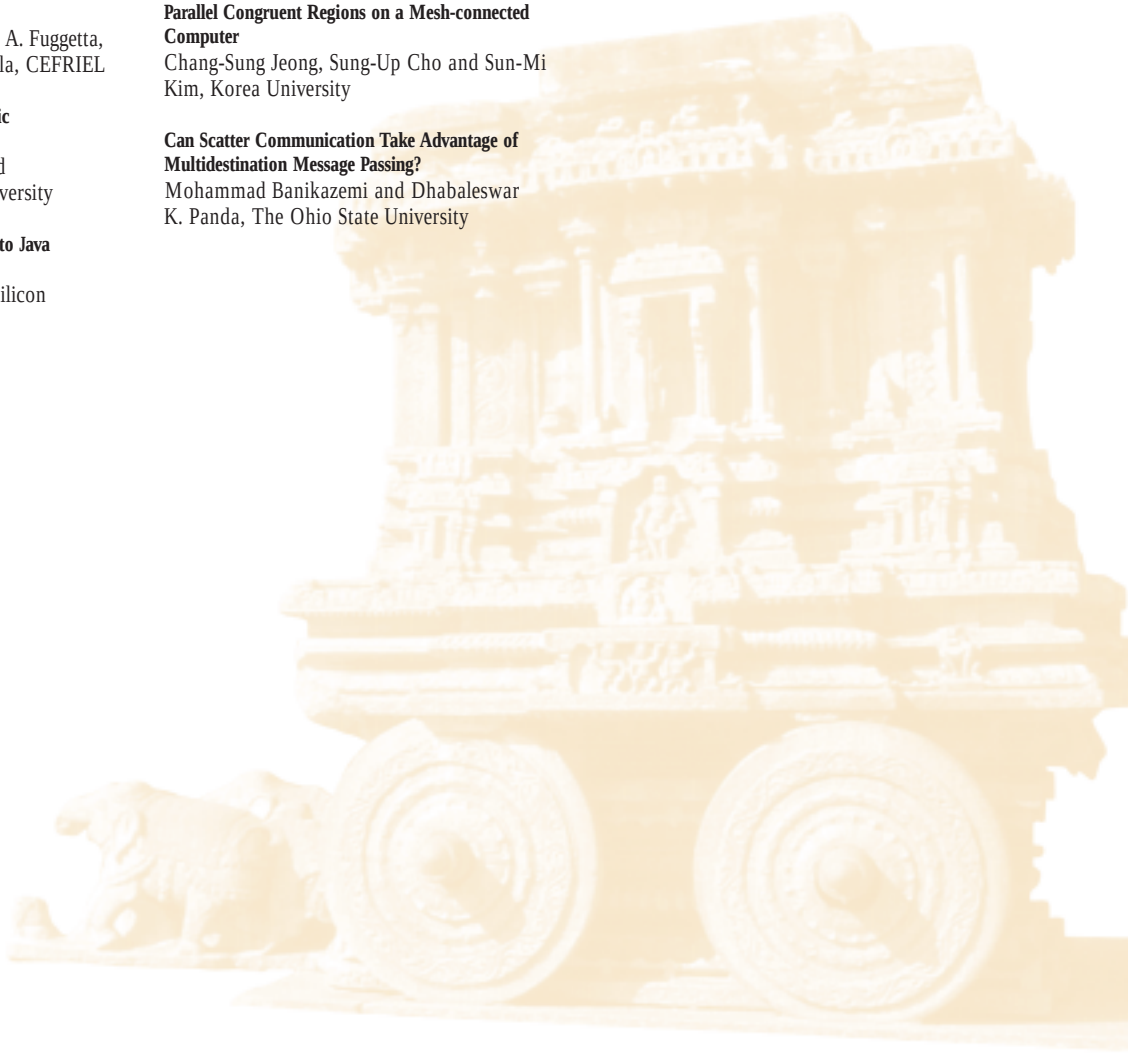
4:30 pm - 6:30 pm

POSTER SESSION

7:00 pm - 10:00 pm

BANQUET

BANQUET SPEAKER
Nikil Jayant
Georgia Research Alliance Eminent Scholar



TUESDAY, DEC. 19

9:00 am - 10:00 am

KEYNOTE ADDRESS
"Whither MPI: Lessons From and Future of MPI"
William Gropp
Argonne National Laboratory

10:30 am - 11:15 am

SPOTLIGHT: EXHIBITS AND ORGANIZATION/COMPANY PRESENTATIONS

11:15 am - noon

INDUSTRY KEYNOTE ADDRESS
"Achieving Scalability on the Internet"
Datta Subramanya
Digital India

1:00 pm - 1:45 pm

INDUSTRY KEYNOTE ADDRESS
"HP's High Performance Computing Strategy"
Frank Baetke
Hewlett Packard, Germany

1:45 pm - 2:30 pm

INDUSTRY KEYNOTE ADDRESS
(Topic to be Announced)
Anant Agrawal
VP, SUN Microsystems

3:00 pm - 4:00 pm

KEYNOTE ADDRESS
"Embedded Computing: New Challenges for Computer Architecture"
Bob Rau
HP Labs

4:30 pm - 6:30 pm

FUTURE PROCESSORS: INVITED SESSION
Co-Chairs: Sriram Vajapeyam, Indian Institute of Science, and Mateo Valero, Technical University of Catalonia
Invitees: Trevor Mudge, University of Michigan, Ann Arbor, Bob Rau, HP Labs, James E. Smith, University of Wisconsin, Madison, Gurindar S. Sohi, University of Wisconsin, Madison

7:00pm - 10:00pm

CULTURAL PROGRAM AND BANQUET

BANQUET SPEAKER
N.R. Narayana Murthy
Chairman, Infosys Ltd., India

WEDNESDAY, DEC. 20

9:00 am - 10:00 am

KEYNOTE ADDRESS

"2001: A Space, Power, and Performance Odyssey"
James R. Goodman
University of Wisconsin, Madison

10:30 am - noon

SESSION III-A

Cluster Computing and its Applications
Chair: Hee Yong Yuon
Information and Communications University, Korea

A Fast Tree-Based Barrier Synchronization on Switch-Based Irregular Networks
Sangman Moh, Chansu Yu, Dongsoo Han, Information and Communications University, Ben Lee, Oregon State University, and Dongman Lee, Information and Communications University

Experiments with the Chime Parallel Processing System
Anjaneya R. Chagam, Intel Corporation, Partha Dasgupta, Arizona State University, Rajkumar Khandelwal, Shashi P. Reddy, Intel Corporation and Shantanu Sardesai, Microsoft Corporation

Meta-Data Management System for High-Performance Large-Scale Scientific Data Access
Wei-keng Liao, Xaiohui Shen, and Alok Choudhary, Nothwestern University

Parallel Sorting Algorithms with Sampling Techniques on Clusters with Processors Running at different Speeds
Christophe Cerin, Universite de Picardie Jules Verne and Jean-Luc Gaudiot, University of Southern California

Evaluation of an Adaptive Scheduling Strategy for Master-Worker Applications on Clusters of Workstations
E. Heymann, M.A. Senar, E. Luque, Universitat Autonoma de Barcelona and M. Livny, University of Wisconsin-Madison

10:30 am - noon

SESSION III-B

Architecture
Chair: Eduard Ayguade
Technical University of Catalonia

Multi-Dimensional Selection Techniques for Minimizing Memory Bandwidth in High-Thoughput Embedded Systems
Thierry J-F. Omnes, IMEC-DESICS, Thierry Franzetti, INP-ENSEEIHT, Francky Catthoor, IMEC-DESICS

Energy-Aware Instruction Scheduling
A. Parikh, M. Kandemir, N. Vijaykrishnan, and M.J. Irwin, The Pennsylvania State University

On Message-Dependent Deadlocks in Multiprocessor/Multicomputer Systems
Yong Ho Song and Timothy Mark Pinkston, University of Southern California

Memory Consistency and Process Coordination for SPARC Multiprocessors
Lisa Higham and Jalal Kawash, The University of Calgary

A New Variable Placement Algorithm for Embedded Processors
Sunil Atri, J. Ramanujam, Louisiana State University, Mahmut Kandemir, The Pennsylvania State University

WEDNESDAY, DEC. 20

1:00 pm - 2:30 pm

SESSION IV-A

Applied Parallel Processing
Chair: Partha Dasgupta
Arizona State University

Improving Parallelism in Asynchronous Reading of an Entire Database
Subhash Bhalla, The University of Aizu, Fukushima

A Parallel Framework for Explicit FEM
Milind A. Bhandarkar, Laxmikant V. Kale, University of Illinois at Urbana-Champaign

Performance Tuning of an Unstructured Mesh Application
W.D. Gropp, D.K. Kaushik, Argonne National Laboratory, D.E. Keyes, Old Dominion University, B.F. Smith, Argonne National Laboratory

Process Interconnection Structures in Dynamically Changing Topologies
Eugene Gendelman, Lubomir F. Bic, Michael B. Dillencourt, University of California, Irvine

Conservative Circuit Simulation on Multiprocessor Machines
Azzedine Boukerche, University of North Texas, Denton

1:00 pm - 2:30 pm

SESSION IV-B

Networks
Chair: C.S. Raghavendra
University of Southern California

Exact Evaluation of Multi-Traffic for Wireless PCS Networks with Multi-Channel
Wuyi Yue, Konan University, Yutaka Matsumoto, I.T.S., Inc.

Distributed Quality of Service Routing
Donna Ghosh, Venkatesh Sarangan and Raj Acharya, State University of New York at Buffalo

Partitioning PCS Wireless Networks for Distributed Simulation
Azzedine Boukerche, Alessandro Fabbri, University of North Texas, Denton

Providing Differentiated Reliable Connections for Real Time Communication in Multihop Networks
Madhavarapu Jnana Pradeep and C. Siva Ram Murthy, Indian Institute of Technology, Madras

Multicast Synchronization Protocol for Multiple Distributed Multimedia Streams
Abderrahim Benslimane, Universite de Technologie de Belfort-Montbeliard

3:00 pm - 4:00 pm

KEYNOTE ADDRESS

"Programming and Execution Models for Processor-in-Memory Arrays"
Hans P. Zima
University of Vienna

4:30 pm - 6:00 pm

SESSION V-A

Wireless and Mobile Communciation Systems
Chair: Azzedine Boukerche
University of North Texas, Denton

Improving Mobile Computing Performance by Using an Adaptive Distribution Framework
F. Le Mouel, M.T. Segarra, F. Andre, IRISA Research Institute

Optimal Algorithms for Routing in LEO Satellite Networks with ISL
A.F. Hassan, M.M. Riad and M.M. Elsokkary, Ciero University

Data Organization and Retrieval on Parallel Air Channels: Performance and Energy Issues
J. Juran, A. Hurson, N. Vijaykrishnan, S. Boonsiriwattanakul, The Pennsylvania State University

A Weight-Based Distributed Clustering Algorithm for Mobile Ad-hoc Networks
Mainak Chatterjee, Sajal K. Das, Damla Turgut, University of Texas at Arlington

Maximizing Throughput via Resource Allocation Subject to QoS Constraints
Jocelyn Chow, Nortel Networks

4:30 pm - 6:00 pm

SESSION V-B

Large-Scale Data Mining
Chair: Gautam Das
Microsoft Research

A Scalable Approach to Balanced, High-Dimensional Clustering of Market Baskets
Alexander Strehl and Joydeep Ghosh, University of Texas at Austin

Dynamic Integration of Decision Committees
Alexey Tsymbal, University of Jyvaskyla

Incremental Mining of Constrained Associations
Shiby Thomas, Oracle Corporation and Sharma Chakravarthy, University of Texas, Arlington

Scalable, Distributed and Dynamic Mining of Association Rules
V.S. Ananthanarayana, D.K. Subramanian and M. Narasimha Murty, Indian Institute of Science, Bangalore

LOCAL INFORMATION

Conference Site:
Taj Residency Hotel
41/3 Mahatma Gandhi Road
Bangalore 560 001, India

Tel: +91-80-558-4444
Fax: +91-80-558-4748

For online hotel bookings and more information please visit our website: http://www.hipc.org/hipc2000/local.html

About Bangalore:
Bangalore is the capital of the state of Karnataka and the fifth largest city in India. This cosmopolitan city, home to the Indian Institute of Science, many IT, aerospace and high technology industries, is often called the Silicon valley of India. Situated at an altitude of approximately 1000 meters above sea level, Bangalore enjoys a pleasant climate throughout the year. The city's prominent architectural landmarks include the Vidhana Soudha (Legislative building), the Palace of the former Maharaja of Mysore and the 19th century Fort of Tipu Sultan. Many historic and archeological sites, wildlife sanctuaries, nature resorts, and places of spiritual interest are within easy reach of Bangalore.

Sightseeing Tour:
A one-day sightseeing tour around Bangalore is planned for Thursday, 21 December. Please check the HiPC website for details.

Travel Checklist

Visa:
All non-Indian-citizens are required to have an Indian visa to enter the country. Please allow yourself sufficient time (say 2-3 weeks) to procure an appropriate visa from your nearest Indian consulate. Please check the conference website for information about Indian consulates.

Flight Reservations:
Flights to India tend to fill up well ahead of the December holiday season. We recommend that you make your flight reservations about 3-4 months in advance, to be on the safe side.

Vaccinations (shots):
Many first-time travellers to India prefer to get preventive vaccinations.

Foreign Exchange:
While international credit cards are widely accepted in commercial establishments in India, several places rely on cash transactions in the local currency (Indian Rupee). We suggest that you carry some Indian currency when entering India or buy Indian currency at the airport when you arrive. The current exchange rate is about Rs. 45/- per US dollar. Once in India, you can buy additional Indian currency from local branches of Citibank, Thomas Cook, etc. However, it is typically difficult to convert Indian currency back into foreign currency because of exchange regulations.

Hotel Reservations:
Please make your hotel reservations ahead of time so that you get your choice of accommodation. Check the conference website for information about a range of accomdations.

Time and Weather:
The Indian Standard Time(IST) is 5 1/2 hours ahead of the Greenwich Mean Time(GMT) and is 13 1/2 hours ahead of the U. S. Pacific Standard Time(PST). In December/January the weather is mildly tropical with temperatures averaging about 22 degrees Celsius (approx. 70 degrees Fahrenheit) during the day and about 14 degrees Celsius (approx. 55 degrees Fahrenheit) during the night.

For detailed local information, please visit the HiPC website at http://www.hipc.org/hipc2000. Check out the local info and accomodation sections.

Images

Cover Page Background
Muru-desh-war Temple Tower, Muru-desh-war Town. (450km west of Bangalore, on the Arabian Sea coast)

Cover Page (left to right)
- *Friezes, outer wall of the 12th Century Chenna-keshava Temple, Belur. (225km west of Bangalore)*
- *Vi-dhaa-na Soudha (House of Legislature), Bangalore.*
- *Vijaya-Vitthala Temple Ruins, Vijaya-nagar Empire (14th to 16th Century), Hampi. (A World Heritage Site located 350km north-northwest of Bangalore)*
- *Kamala Mahal (Lotus Palace), Zenana enclosure of Hampi city. 16th Century Indo-Saracenic Architecture, different from the typical Hindu temple architecture.*
- *Friezes, outer wall of the 16th Century Vijaya-Vitthala Temple, Hampi.*

Page 1
Stone Chariot, 16th Century Vijaya-Vitthala Temple, Hampi.

Page 2
Friezes, outer wall of the 12th Century Chenna-Keshava Temple, Belur.

Page 5
Chenna-Keshava Temple, Belur. 12th Century.

Page 6
Watch Tower Ruins, Hampi City. 14th-16th Century Vijaya-nagar Empire.

Page 9
The Demon Mahi-shaa-sura, 12th Century Chaa-mun-desh-wari Temple enclosure, Mysore. (150km southwest of Bangalore)

Page 13
Stone Chariot, 16th Century Vijaya-Vitthala Temple, Hampi.

Page 14
Kar-naa-taka High Court, Bangalore.

Page 16
Temple Tower, still-functional 16th Century Viroo-paa-ksha Temple, Hampi.

High Performance Computing 2000
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