

Arkansas Society for Computer  
and Information Technology (ASCIT)  
P.O. Box 4487  
Little Rock, AR 72214

First Class

Advance Program

**1990 ACM/IEEE SYMPOSIUM ON  
APPLIED COMPUTING**

**University of Arkansas Conference Center  
Fayetteville, Arkansas**

**April 5-6, 1990**



## Conference Chair

Hal Berghel  
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Univ. of Arkansas, Fayetteville  
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## Program Chair

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G. Whitson, Univ. Texas-Tyler  
J. Wiggins, U. Ark.-Fayetteville  
R. Wilkerson, U. Missouri-Rolla  
R. Zimmerman, U. Ark.-Fayetteville

## CONFERENCE INFORMATION

### LOCATION:

The 1990 ACM/IEEE Symposium on Applied Computing (SAC-90) will be held April 5-6, 1990 at the #2 University of Arkansas Conference Center in Fayetteville, Arkansas. The Conference Center is adjacent to the Fayetteville Hilton located at 70 North East Street in Fayetteville, Arkansas.

### RESERVATIONS

Room rates are \$49 per night for single occupancy and \$57 per night for double occupancy. Please mention the 1990 Symposium on Applied Computing when you make the reservations to ensure you receive the special conference fee. Reservations can be made by calling  
The Fayetteville Hilton, (501)442-5555.

### CONFERENCE TRAVEL AGENT

SAC-90 has an agreement with a local travel agent to provide transportation and hotel reservations for participants. If you are interested in this service, please contact Ms. Beverlee Dugger, Travel Fair, 2334 North College Ave., Fayetteville, AR 72703; (501) 442-8100; TELEX: 4954986.

### CONFERENCE COORDINATOR

The SAC-90 conference coordinator is Mr. Rick Stroud, #2 University Center, University of Arkansas, Fayetteville, AR 72701; (501) 575-3604. Please contact Rick with questions concerning conference registration. You may register for SAC-90 either by phone or mail. If you wish, you may charge your registration to your VISA or MASTERCARD credit cards by calling Rick at the number above.

### ADVANCE REGISTRATION

The registration fee includes a copy of the proceedings, two lunches, and a reception on Thursday evening. Reduced registration fees are available to members of the following professional societies: the Association for Computing Machinery (ACM); the Computer Society of the Institute for Electrical and Electronics Engineers (IEEE/CS); and the Arkansas Society for Computer and Information Technology (ASCIT). If you wish to take advantage of these discounts, please provide your membership number on the Registration Form. The fee schedules appear below.

Preregistration: Before March 15  
society members \$100  
society non-members \$125  
students \$35

General Registration: After March 15  
society members \$125  
society non-members \$150  
students \$45

registration form

Return to: **1990 SYMPOSIUM ON APPLIED COMPUTING**

#2 University of Arkansas Conference Center

Fayetteville, Arkansas 72701

APRIL 5-6, 1990

sponsored by: The Arkansas Society for Computer and Information Technology (ASCIT), the University of Arkansas Conference Center, the University of Arkansas Student Chapter of the Association for Computing Machinery

in cooperation with: The Association for Computing Machinery (ACM) and the Computer Society of the Institute for Electrical and Electronics Engineers (CS/IEEE)

institutional support: Blue Cross and Blue Shield of Arkansas, AMOCO, and the National Science Foundation (NSF)

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( ) enclosed is my registration in the amount of \_\_\_\_\_

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## PRELIMINARY CONFERENCE PROGRAM

Thursday, April 5, 1990

8:00-9:00 REGISTRATION

9:00-9:15 OPENING REMARKS

9:15-10:00 KEYNOTE ADDRESS

*Information Technology, Information Resources: The Haves, The Have Nots*

Donald D. Fisher

The University of Texas at Tyler

10:00-10:30 BREAK

10:30-12:00 PARALLEL SESSIONS

**TRACK I: Software Engineering**

*A Depth-First Approach To System Integration*

Alan Tsu-I Yaung

Northeast Louisiana University

*A Design Approach for a Distributed Test Automation System*

Steven Glicker

Frederick Hosch

University of Texas at Austin

*Correspondent Computing Software Implementation Fault Tolerance*

Pen-Nan Lee

Jeff Blankenship

University of Houston-University Park

*Defining Medical Software for Safety*

Patricia Schneider

Mary Lou A. Hines

University of Missouri-Kansas City

**TRACK II: Neural Nets**

*Neural Networks for Invariant Object Recognition*

A.D. Kulkarni

Al. C. Yap

P. Byars

University of Texas at Tyler

*Comparing Learning Accuracies of Neural Nets and Decision-Tree Classifier Systems*

A.K. Rigler

D.C. St. Clair

University of Missouri-Rolla

*An Improved N-Dimensional Self-Organizing Neural Network Simulator*

Charles L. Wheatley  
Halliburton Company

*A Spreadsheet Method For Studying Neural Networks*

Donnal C. Walter  
Michael M. McMillan  
Arkansas Children's Hospital

**TRACK III: Database-1**

*The Functional Data Model and a Dataflow Style of Query Processing*

Forouzan Golshani  
Arizona State University

*DAVID: NASA's Heterogeneous Distributed Database Management System*

Bharat Bhasker  
Science Applications Research  
Shou-Hsuan Stephen Huang  
University of Houston  
Barry E. Jacobs  
Goddard Space Flight Center

*Incremental Clustering for Dynamic Document Databases*

Fazli Can  
Nicklas D. Drochak II  
Miami University

*Improvement of Concurrency Control Within Object-Oriented Database Systems*

Sumin Wang  
Arizona State University

**12:00-1:30 LUNCHEON**

**1:30-3:00 PARALLEL SESSIONS**

**TRACK I: Parallel Processing**

*A Backpropagation System For Hypercubes*

George Whitson  
Cathy Wu  
Greg Montllor  
Adisorn Ermongkonchai  
University of Texas at Tyler

*Parallelization of the Dynamic Programming Algorithm for the Matrix Chain*

*Product on a Hypercube*

Steve A. Strate  
Roger L. Wainwright  
University of Tulsa

*A Functional Program Describing A Simple Reservoir Model and Its Potential For Parallel Computation*

Rex L. Page  
Marian E. Sexton  
Roger L. Wainwright  
University of Tulsa

*Parallel Algorithms on a Mesh with Multiple Broadcasting*

Chung Hornng Lung  
Arizona State University

**TRACK II: Expert Systems-1**

*Automatic Knowledge Acquisition for Expert Systems*

Mark W. Wheeler  
HARRIS Government Communications Systems Div.  
M. Schneider  
Florida Institute of Technology

*A Knowledge-Based Assistant for Pesticide Identification*

Pat Schneider  
Steven K. Graham  
University of Missouri at Kansas City

*Building Critiquing Expert Systems In Prolog*

Mark Shifman  
University of Arkansas for Medical Sciences

*The Design Of An Object-Oriented Modular Expert System Shell*

Jin Cheon Na  
Blayne E. Mayfield  
K.M. George  
Oklahoma State University

**TRACK III: Logic and Symbolic Programming**

*Ternary Boolean Algebra Unification*

Ralph Wilkerson  
Dan Murphy  
Bill Pinet  
Jeff Jenness  
Dwayne Brazeal  
University of Missouri-Rolla

*Denotational Semantics-Directed Compilation Using Prolog*

Barrett R. Bryant  
Aiqin Pan  
University of Alabama at Birmingham

*A Logic Based Approach to the Recognition of Overlapping 2-D Geometrical Objects*

David Roach  
Hal Berghel  
Yihsin Cheng  
University of Arkansas, Fayetteville

## PANEL SESSION

### *Non-Standard Logics for Expert Systems*

Richard Rankin, Moderator  
University of Arkansas, Fayetteville

## 3:30-5:00 PARALLEL SESSIONS

### TRACK I: Graphs and Networks

#### *Structural Properties of the Graph of Augmented Sparse Approximate Inverses*

J.D.F. Cosgrove  
Cameron University  
J.C. Diaz  
University of Tulsa

#### *Graph Processing By Which To Evacuate A Mine*

Tom M. Hughes  
Kentucky State University

#### *A Statistical Mechanics Approach to the Directed Steiner Problem on Networks*

Lawrence J. Osborne  
Southwest Missouri State University

#### *An Application Algorithm For The Via Minimization Problem In Channel Routing*

Haklin Kim  
University of Tennessee

### TRACK II: Expert Systems-2

#### *An Expert Decision Support System For Auditor Going Concern Evaluation*

Carolyn R. Harris  
William T. Harris Jr.  
Lamar University

#### *An Expert System Solution To A Constraint Satisfaction Problem in Academic Administration*

Gary McDonald  
Merry McDonald  
Northwest Missouri State University

#### *Expert Systems as Overlapping Logical Theories*

David Roach  
Hal Berghel  
University of Arkansas, Fayetteville

#### *A Rule Based Expert System for Check Routing and Cash Letter Management*

John Chamberlin  
Arkansas Systems, Inc.  
Donna Mooney  
Angelina Caraway  
John Talburt  
University of Arkansas at Little Rock

## TRACK III: Database-2

#### *A Conceptual View of Temporal Databases*

Edward J. Coburn  
Emporia State University/Kansas State Univ.

#### *Reload In A Main Memory Database System: MARS*

Le Gruenwald  
Southern Methodist University

#### *Query Optimization in the ADDS Multidatabase System*

Tom C. Reyes  
Wen F. Lee

Pete L. Olson  
George F. Thomas  
Glenn R. Thompson  
Bing Vassaur

#### *AMOCO Production Company*

#### *Deductive Databases-----Where to Now?*

Mengchi Liu  
John Cleary  
University of Calgary

## PANEL SESSION

#### *Software Reliability: Theory, Practice and Controversy*

Frederick T. Sheldon, Moderator  
General Dynamics

## 5:00-6:00 SOCIAL HOUR

## 6:00-7:30 CONFERENCE RECEPTION

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Friday, April 6, 1990

8:00-9:00 REGISTRATION

9:00-10:00 INVITED ADDRESS

Speaker to be announced

10:00-10:30 BREAK

10:30-12:00 PARALLEL SESSIONS

**TRACK I: Information Retrieval and Office Automation**

*Assignment of Term Descriptors to Clusters*

Sanjiv K. Bhatia

Jitender S. Deogun

University of Nebraska-Lincoln

Vijay V. Raghavan

Univ. of Southwest Louisiana

*Using Active Messages To Implement Office Procedures*

Y.D. Liu

K.W. Wong

E.A. Unger

Kansas State University

*Logic of Knowledge and Belief in the Design of Integrity Kernels for Office Systems*

S. Ramanna

J.F. Peters

E.A. Unger

Kansas State University

*A Database Model for User Interface Management Systems*

Gary T. Anderson

University of Arkansas at Little Rock

Lever Wang

UIMS, Inc.

**TRACK II: Computational Linguistics and Natural Language Processing**

*A Semantic Interpreter for a Transportable Command Language Interface*

Lisa E. Moore

Micheal B. O'Neal

Grambling University

*Generalization of Solutions Sets For Unconstrained Crossword Puzzles*

G.H. Harris

Griffith University, Australia

*On The Bayesian Estimation And Computation Of The Number Of Solutions To Crossword Puzzles*

G.H. Harris

J.J.H. Forster

Griffith University, Australi

*Approximate String Matching and the Automation of Word Games*

Hal Berghel

David Roach

University of Arkansas, Fayetteville

John R. Talburt

University of Arkansas at Little Rock

**TRACK III: Parallel Processing and Distributed Systems**

*Connection Machine Implementation of an Approximate Inverse Preconditioning with Minimum Residual Iteration*

J.C. Diaz

Tung Mansfield

University of Tulsa

*CONDUCTOR: A Reliable Model for Distributed Communicating Processes*

James F. Peters

Sheela Ramanna

Kansas State University

*Sender Vs. Receiver Initiated Load Balancing: A Distributed System*

*Implementation Study*

Andrew Ross

Bruce McMillin

University of Missouri at Rolla

*Monitoring Distributed Embedded Systems*

Ray Ford

University of Kansas

**TRACK IV: Database and Operating Systems**

*Message Routing Algorithms for Static Task Scheduling*

Ming-fang Wang

University of Central Arkansas

*FRED: A Frame-Based Methodology for Representing the Entity-Relationship Diagrams*

Hossein Saiedian

Theodore J. Strasser III

University of Nebraska at Omaha

*IAM: An RDBMS Implementation Architecture for Microcomputers*

Ray Hashemi

University of Arkansas at Little Rock

## 1:30-3:00 PARALLEL SESSIONS

### TRACK I: Networking

#### *A Common Software Interface for Microcomputers*

Peter C. Isaacson

Terry A. Scott

University of Northern Colorado

#### *Prioritized Protocols for Multi-Bus Local Area Networks*

Xin-Jia Ma

Narayan Subramanian

University of Missouri-Kansas City

#### *Decentralized Multi-Point Routing In Wide Area Networks*

Narayan Subramanian

Sherry Liu

University of Missouri-Kansas City

### TRACK II: Object Oriented Systems

#### *Object-Oriented Database Support for Hierarchical Performance Modeling of Real-time, Distributed Software Systems*

Reda A. Ammar

Ping Zhang

University of Connecticut

#### *Description of A New Approach To Object Inheritance*

H.M. Al-Haddad

K.M. George

M.H. Samadzadeh

Oklahoma State University

#### *Management of Spatial Data: Basic Issues and Some Solutions*

Eliseo Clementini

Paolino Di Felice

Universita dell' Aquila, Italy

### TRACK III: Simulation

#### *"DEERCARE", A Deer Population And Hunting Simulation Model*

Claude C. Barnett

Walla Walla College

David J. Stewart

Charles J. Amlaner, Jr.

University of Arkansas, Fayetteville

#### *The Introduction of Simulation Modeling to Wildlife Management in Arkansas*

Charles J. Amlaner, Jr.

David J. Stewart

University of Arkansas, Fayetteville

Claude C. Barnett

Walla Walla College

#### *A Graphically-Oriented Method for Representing Matrices in Simulations*

Claude C. Barnett

Walla Walla College

David J. Stewart

University of Arkansas, Fayetteville

## 3:30-5:00 PARALLEL SESSIONS

### TRACK I: Graphics

#### *User Friendly Front End for a MPS PC Program*

Jong-I Perng

Elizabeth A. Unger

Kansas State University

#### *PC Based Software for Real Time Decoding and Partial Encoding IFS Codes*

Vipul R. Doshi

University of Arkansas at Little Rock

Stephen R. McNeill

University of South Carolina

#### *Automatic Vectorization of Scanned Engineering Drawings*

Ali Manesh

Joseph Wrobel

Jianhua Gao

University of Arkansas, Fayetteville

#### *A Distributed Group Tool for Issue Analysis*

Stephen Hayne

Titus Purdin

University of Arizona

### TRACK II: Algorithms and File Management

#### *A Fast Pascal Program For The Product Of Large Sparse Matrices On Personal Computers*

Antonio Agnifili

Universita dell'Aquila/Fondazione Limmat Zurigo

Paolino Di Felice

Universita dell' L'Aquila, Italy

#### *Compressing Tries for Storing Dictionaries*

Titus Purdin

University of Arizona

#### *A Faster Algorithm for Finding Weighted Distance Tiles*

W.D. Hoskins

J.A. Hoskins

University of Manitoba

*Data Compression With Huffman Coding: An Efficient Dynamic Implementation*

Faisal Saeed

H. Lu

G.E. Hedrick

Oklahoma State University

**TRACK III: Queues and Architecture**

*The Generalized MIG/IN-Queue As A Model For Time-Sharing Systems*

Aby Tehranipour

University of Vermont

Lester Lipsky

University of Nebraska

*A Highly Reliable Pyramid Tree Network Architecture*

Mohammad Mohsin

Bidyut Gupta

Southern Illinois University at Carbondale

*The Conditional- and Residual Waiting Time Distributions of the MIG/I Queue*

Appie Van De Liefvoort

University of Missouri-Kansas City

*Evolution of Architectural Design Representations*

Richard E. Courtney

David A. Gustafson

Kansas State University