

International Society for Computers
and Their Applications

21st International Conference on Computers and Their Applications

March 23-25, 2006
Seattle, Washington USA

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 978-1-60423-496-1

Some format issues inherent in the e-media version may also appear in this print version.

INTERNATIONAL SOCIETY FOR COMPUTERS AND THEIR APPLICATIONS

21st International Conference on Computers and Their Applications

March 23-25, 2006
Red Lion Hotel on Fifth Avenue, Seattle, Washington USA

TECHNICAL PAPER INDEX

ALGORITHMS

Aspects of Z Order with Possible Applications <i>Kirk Scott (University of Alaska Anchorage, USA)</i>	1
Design and Implementation of a Dependable Interpreter for Functional Programs <i>Y. Takigiku, Y. Oota and K. Kaneko (Tokyo University of Agriculture and Technology, Japan)</i>	7
Immune Algorithm Processor <i>Masaya Yoshikawa, Masahiro Fukui, and Hidekazu Terai (Ritsumeikan University, Japan)</i>	13
Decomposition of XML Path Expressions <i>Yan Liu and Gongzhu Hu (Central Michigan University, USA)</i>	19
Restricted Weighted Minimum Independent Domination on I_k-starlike Graphs <i>William Chung-Kung Yen (Shih Hsin University, Taiwan)</i>	25
Parallelizing Frequent Itemset Mining with FP-Trees <i>Peiyi Tang and Markus P. Turkia (University of Arkansas at Little Rock, USA)</i>	30
Achieving $O(n^3 / \log n)$ Time for All Pairs Shortest Paths by Using a Smaller Table <i>Yijie Han (University of Missouri at Kansas City, USA)</i>	36
Improved Algorithm for the Symmetry Number Problem on Trees <i>Yijie Han (University of Missouri at Kansas City, USA)</i>	38
A Framework for Clustering on Data Streams <i>Zhewei Jiang, Wen-Chi Hou, Chi-Fang Wang (Southern Illinois University, USA), Huaqing Wang (California State University, Bakersfield, USA), and Jie Chen (Southern Illinois University, USA)</i>	41
An Alternative Arrangement of Symmetric Datasets for Vertical Clustering Algorithms <i>Taufik Abidin and William Perrizo (North Dakota State University, USA)</i>	47
Robust Successive Clustering via Feature Similarity <i>Carl G. Looney (University of Nevada, Reno, USA)</i>	53

COMPUTER, NETWORK AND SYSTEMS ARCHITECTURE

Validation of the Potentials of Vertical Striping on Disks <i>Cheng Luo, Wen-Chi Hou, Chih-Fang Wang (Southern Illinois University, USA), and Huaqing Wang (California State University, Bakersfield, USA)</i>	57
Designing a Conditional Merge Component - From Streams to State Transitions <i>Walter Dosch (University of Lübeck, Germany) and Tõnu Tamme (University of Tartu, Estonia)</i>	64

A Bird's Eye View of Some Common Elements of Science of Design Applicable to the Design of Software Systems	
<i>Lokesh Shivaramaiah and Thomas Philip (Mississippi State University, USA)</i>	72
Effect of Architecture and Component Parameters on Application Performance and Reliability	
<i>Rehab A. El Kharboutly, Reda Ammar and Swapna S. Gokhale (University of Connecticut, USA)</i>	78
Traffic Monitoring for a Network Visualization Environment	
<i>Chia-Pin R Liu, Shaofeng Yang, Mahmoud A. Manzoul (Jackson State University, USA)</i>	84
Advanced Hybrid Branch Predictors for High-Performance CPUs	
<i>Venkata S. Yerasi and Wei-Ming Lin (The University of Texas at San Antonio, USA)</i>	90
Understanding the Behavior of Simultaneous Multithreaded and Multiprocessor Architectures	
<i>Nagi N. Mekhriel (Ryerson University, Canada)</i>	96
Moments of Memory Access Time for Systems With Hierarchical Memories	
<i>Kishori M. Konwar, Lester Lipsky, and Marwan S. Sleiman (University of Connecticut, USA)</i>	103

NEURAL NETWORKS

Developing MIMO Controller by Neuro-traveling Particle Swarm Optimizer Approach	
<i>Chwen-Tzeng Su and Jui-Tsung Wong (National Yulin University of Science and Technology, Taiwan)</i>	110
Classification of Chemical Data Sets Using Neural Networks	
<i>S. E. Hudson (California State University, Bakersfield, USA)</i>	116
A Novel Multiagent Supervisory Loop based Control Algorithm for Fighter Aircraft Pitch Rate Tracking	
<i>Sukumar Kamalasadana (University of West Florida, USA) and Anurag Kumar Srivastava (Mississippi State University, USA)</i>	122
On Parameter Selection for an Adaptive Neural Network Fuzzy Inference Controller Using Evolutionary Tuning	
<i>Gordon K. Lee (San Diego State University, USA) and Edward Grant (North Carolina State University, USA)</i>	128

GRAPHICS, VIDEO AND IMAGE PROCESSING

The Multi-Purpose Watermarking for Color Halftone Image Based On Wavelet and Zernike Transform	
<i>Ching-Tang Hsieh, Kuan-Ting Yeh, Wan-Ting Kuo (TamKang University, Taiwan)</i>	133
Image Coding Using Wavelet Transform Techniques	
<i>Dianhui Xu, Robert Li, David Song (North Carolina A&T State University, USA)</i>	139
Reversible Integer-to-Integer Wavelet Transform for the H.264 Advanced Video Codec Standard	
<i>Manjari Mishra, Mohamed El-Sharkawy, Maher Rizkalla and Paul Salama (Purdue University, Indianapolis, USA)</i>	145
Efficient Parallel Rendering on Hypercube	
<i>John Jenq (Montclair State University, USA)</i>	152
An Application for Automatic Extraction of Objects from Digital Images	
<i>Dulal C. Kar and Dennis Ma (Texas A&M University-Corpus Christi, USA)</i>	158

Partial Object Recognition based on an Ellipse using Symmetry in Image Databases <i>June-Suh Cho (Hankuk University of Foreign Studies, Korea) and Joonsoo Choi (Kookmin University, Korea)</i>	163
Integrated Documentary Video Access for Education <i>Aijuan Dong and Honglin Li (North Dakota State University, USA)</i>	168
An Efficient Approach for the Restoration of Impulse Noise Corrupted Images <i>Wenbin Luo (St. Mary's University, USA)</i>	174

COMPUTER SIMULATION

Discrete Shells Origami <i>Rob Burgoon, Zoë J. Wood (California Polytechnic State University, USA) and Eitan Grinspun (Columbia University, USA)</i>	180
Numerical Wire Grid Modeling of Cavity Resonators to determine Quality Factors <i>Franz A. Pertl, Andrew D. Lowery, and James E. Smith (West Virginia University, USA)</i>	188
vHand: A Human Hand Simulation System <i>Beifang Yi, Frederick C. Harris, Jr., and Sergiu M. Dascalu (University of Nevada, Reno, USA)</i>	192
Computational Simulation of Heat Transfer Enhancement from Surfaces with Cavities <i>Geo Lee and Suresh Chandra (North Carolina A&T State University, USA)</i>	200

EXPERT AND CLASSIFIER SYSTEMS

Shoehicken: An Intelligent System for Recommending RSS/Atom Content <i>James Horsley, Michael Wooten, and Eman El-Sheikh (University of West Florida, USA)</i>	206
A New Measure of Text Relatedness Using a Novel Classifier-based Vector Approach <i>Chung-Hong Lee (National Kaohsiung University of Applied Sciences, Taiwan), Hsin-Chang Yang (Chang Jung University, Taiwan), and Feng-Chih Hsu (National Kaohsiung University of Applied Sciences, Taiwan)</i>	211
A New Gene Selection Technique Using Feature Selection Methodology <i>Noushin Ghaffari and Hisham Al-Mubaid (University of Houston - Clear Lake, USA)</i>	217
A General Framework for the Development of Automated Decision Support Systems <i>D. L. Hudson, M. E. Cohen (University of California, San Francisco, USA)</i>	223

SPECIAL SESSION on TECHNOLOGY and RURAL HEALTH

Using Computer Technology to Enhance Chronic Illness Management <i>Clarann Weinert (Montana State University, USA)</i>	229
Distance Learning and Simulation Technologies to Support Bioterrorism Preparedness Education <i>Rameshsharma Ramloll, Jaishree Beedasy, Beth H. Stamm, Neill Piland, Barbara Cunningham, Anne Kirkwood, Phil Massad, Russ Spearman, Arvind Patel, Rick Tivis, Cyndy Kelchner (Idaho State University, USA)</i>	235
Technology-based Interventions for Promoting Rural Health: Building Community Readiness <i>Sharon Cumbie, Jennifer Earls and Rex Gantenbein (University of Wyoming, USA)</i>	242

SPECIAL SESSION on SOFTWARE SYSTEMS: DESIGN, DEVELOPMENT, MANAGEMENT AND ANALYSIS

Crown Vision: Metrics Visualization for Project Management

Sergiu Dascalu (University of Nevada-Reno, USA), Norm Brown (National Institute for Systems Test and Productivity, USA), Sohei Okamoto, Sermsak Buntha and Namit Chawla (University of Nevada-Reno, USA) 246

Object-Oriented Design and Implementation of the OE-Scheduler in Real Time Environments

Ilhyun Lee, Cherry K. Owen, and Haesun K. Lee (University of Texas Permian Basin, USA) 254

Software Correctness

M. Burgin (University of California, Los Angeles, USA) and N. Debnath (Winona State University, USA) 259

Workflow Modeling and Simulation using a Extension of UML Activity Diagram

D. Riesco, G. Montejano and Robert Uzal (Universidad Nacional de San Luis, Argentina), Manuel Perez Cota and J. Baltasar García Perez-Schofield (Universidad de Vigo, España), and Narayan Debnath (Winona State University, USA) 265

DISTRIBUTED SYSTEMS

A Generalized Broadcasting Schema for the Mesh Structures

Zhizhang Shen (Plymouth State University, USA) 270

An Extended Framework of Safe Stabilization

Alina Bejan, Sukumar Ghosh, Shrisha Rao (University of Iowa, USA) 276

A High-Performance Recovery Algorithm for Distributed Systems

B. Gupta, Y. Yang, S. Rahimi, and A. Vemuri (Southern Illinois University, USA) 283

Low-Overhead Roll-Forward Checkpointing and Failure Recovery for Distributed Systems

B. Gupta, S. Rahimi, R. A. Rias, and R. Bhupathi (Southern Illinois University, USA) 289

Cohorts for Group Mutual Exclusion

Fouad B. Chedid (Notre Dame University, Lebanon) 295

A Load Balancing Technique for Some Coarse-Grained Multicomputer Algorithms

Thierry Garcia and David Semé (Université de Picardie Jules Verne, France)..... 301

Highly Constrained Tasks Scheduling on Multiprocessing Systems

Abdelmageed Elsadek Abdelrazek (College of Business Administration, Saudi Arabia) 307

Load Balancing Experiments in openMOSIX

J. Michael Meehan and Adam Wynne (Western Washington University, USA) 314

COMPUTING PRACTICE AND APPLICATIONS

Object-Oriented Finite Element Programming Using F2003

J. H. Nie, H. T. Hsieh, Y. T. Chen, L. J. Sun (University of Nevada, Las Vegas, USA), David A. Hopkins (Army Research Laboratory, USA), and Randy Clarksean (University of Nevada, Las Vegas, USA) 320

WIQS: Web Integration Query System

Brian Harrington, Robert Brazile, and Kathleen Swigger (University of North Texas, USA) 326

Multi-channel Software-Oriented Pulse Width Modulation (SPWM)

Marwan Sleiman (University of Connecticut, USA) 332

Dynamic Authentication Using Keystroke Biometrics <i>Jeffrey L. Hieb and James H. Graham (University of Louisville, USA)</i>	337
SLA Strategy and Integration Technology in Security Operation Center <i>Shin-Jer Yang (Soochow University, Taiwan), Hsiang-Yin Kuo (National Tsing-Hua University, Taiwan) and Yung-Chun Chen (National Taiwan University of Science and Technology, Taiwan)</i>	343
Applying a Multi-level Security Mechanism to a Network Address Translation Scheduler <i>Arthur McDonald, Haklin Kimm (East Stroudsburg University of Pennsylvania, USA), Haesun Lee and Ilhyun Lee (University of Texas of the Permian Basin, USA)</i>	350
A Meta-Interpreter in Prolog for Extended Logic Programs <i>James D. Jones (Angelo State University, USA)</i>	356

DATA MINING

Clustering Microarray Data based on Density and Shared Nearest Neighbor Measure <i>Ranapratap Syamala, Taufik Abidin, and William Perrizo (North Dakota State University, USA)</i>	360
Vertical K-Median Clustering <i>Amal Perera, William Perrizo (North Dakota State University, USA)</i>	366
Extracting Interestingness Dimensions for Search Time in Visual Cluttered Scenes <i>Deok Hee Nam (Wilberforce University, USA), Harpreet Singh (Wayne State University, USA) and Tom Meitzler (US Army Tank-automotive and Armaments Command Research Development and Engineering Center, USA)</i>	372
A Unified Theory of Data Mining Based on Unipartite and Bipartite Graphs <i>William Perrizo (North Dakota State University, USA)</i>	378

DATA COMMUNICATIONS

Network Optimization in Wireless Sensor Networks <i>Min Song, Prabhu V Krishnan (Old Dominion University, USA)</i>	383
Localization in Wireless Sensor Grids <i>Chen Zhang and Ted Herman (University of Iowa, USA)</i>	388
Time Based Node Localization in Multi Hop Wireless Sensor Networks <i>Henrik Schioler, Martin B. Hansen, and Hans P. Schwefel (Aalborg University, Denmark)</i>	394
Measuring Cell-Phone GPS Accuracy <i>Bruce Beyeler and David C. Pheanis (Arizona State University, USA)</i>	401

BIOINFORMATICS

An Efficient Algorithm for Globally Aligning DNA Sequences <i>Muzammil A. Khan (NUST Institute of Information Technology, Pakistan), H. Farooq Ahmad (Communication Technologies, Japan), Ashrad Ali (NUST Institute of Information Technology, Pakistan), Hiroki Suguri (Communication Technologies, Japan), Faran Javed Chawla, M. Atif (NUST Institute of Information Technology, Pakistan) and H. Ghulam Mujtaba (Govt. Teacher Training College, Pakistan)</i>	407
Distributed Mining of Multiple String Commonalities <i>Michael Mann and James Hearne (Western Washington University, USA)</i>	413
An Application of Grid Computing to Pharmacophore Discovery Using Inductive Logic Programming <i>Nathan P. Johnson and James H. Graham (University of Louisville, USA)</i>	418

DATABASES

Grid File for Efficient Data Cube Storage

Cheng Luo, Wen-Chi Hou, Chih-Fang Wang (Southern Illinois University, USA), Huaqing Wang (California State University, Bakersfield, USA), and Xiaoguang Yu (Southern Illinois University, USA) 424

Aggregate Function Computation and Iceberg Querying in Vertical Database

Yue Cui and William Perrizo (North Dakota State University, USA) 430

Static Allocation in Distributed Object Oriented Databases Using Simulated Annealing Algorithms

J. M. Graham and M. L. Williams (Norfolk State University, USA) 436

Statistic Preserving Steganography using Database Tables

George Hamer (South Dakota State University, USA) and William Perrizo (North Dakota State University, USA) 441