

19th International Conference on Computers and Their Applications 2004

**Seattle, Washington. WUC
18-20 March 2004**

Editors:

B. Gupta

ISBN: 978-1-61839-551-1

Printed from e-media with permission by:

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



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

Copyright© (2004) by the International Society for Computers and Their Applications
All rights reserved. Reproduction in any form without the written consent of ISCA is prohibited.

Original ISBN: 1-880843-50-1 (Out of Print)
Reprint ISBN: 978-1-61839-551-1

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact the International Society for Computers and Their Applications
at the address below.

International Society for Computers and Their Applications
975 Walnut Street, Suite 132
Cary, NC 27511-4216

Phone: (919) 467-5559
Fax: (919) 467-3430

isca@ipass.net

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

INTERNATIONAL SOCIETY FOR COMPUTERS AND THEIR APPLICATIONS

19th International Conference on Computers and Their Applications

March 18-20, 2004
Red Lion Hotel on Fifth Avenue, Seattle, Washington USA

TECHNICAL PAPER INDEX

IMAGE PROCESSING

A Real-time Quadtree Searchless Fractal Image Compression Device <i>Songpol Ongwattanakul, Xianwei Wu, David Jeff Jackson (The University of Alabama, USA)</i>	1
A New Searchless Two-Level IFS Fractal Image Encoding Method <i>Xianwei Wu, David Jeff Jackson, Hui-Chuan Chen (The University of Alabama, USA)</i>	6
Video Mosaics Based on Steepest Descent Algorithm <i>Ching-Tang Hsieh, Eugene Lai, Sung-Yi Chen (Tamkang University, Taiwan)</i>	11
Image Coding Based on One-step Wavelet Transform <i>Qiang Bo, Jeff A. Shafer, Waleed W. Smari, John G. Weber and Frank Scarpino (University of Dayton, USA)</i>	15
Adaptive Image Compression with Neural-Net Predictor Optimized by Quasi-Simulated Annealing <i>Satoshi Mizuta (Hirosaki University, Japan)</i>	21
Morphological Image Processing Using Custom Instructions on Distributed Nios Processors <i>Haichen Ren and David J. Jackson (The University of Alabama, USA)</i>	25
Angular Histograms for Shape Retrieval <i>Atul Sajjanhar (Deakin University, Australia), Guojun Lu, Dengsheng Zhang (Monash University, Australia)</i>	29
Image Retrieval Using Modified Generic Fourier Descriptors <i>Atul Sajjanhar (Deakin University, Australia), Guojun Lu, Dengsheng Zhang (Monash University, Australia)</i> ..	32
A Real-Time 2-D Pattern Recognition using Spatial Circular Cross-Correlation <i>Zoubir Hamici (Amman University, Jordan)</i>	36
Comparative Experiments on Clustering Validities <i>Crystal Z. Huang and Carl G. Looney (University of Nevada, Reno, USA)</i>	42
On Estimation Of 3D Hand Position Using Stereo Vision <i>M. B. Teruel, O. Kubushyna, R. El-khater, E. A. Yfantis (University of Nevada Las Vegas, USA) and R. Boyle (NASA Ames Research Center, USA)</i>	47
Contrast-detail Analysis of a CMOS-based Digital X-ray Imaging System <i>Qirong Zhang, Yuhua Li, Ben Steele (University of Oklahoma, USA), Wei R. Chen (University of Central Oklahoma, USA), Xizeng Wu (University of Alabama at Birmingham, USA), John Cheung, and Hong Liu (University of Oklahoma, USA)</i>	51

MODELING & SIMULATION

A Study of a Generalization of a Card Problem <i>Zhizhang Shen (Plymouth State University, USA) and Timothy Healy (Emporia State University, USA)</i>	55
Modeling Methods for Coastal Environmental Studies <i>Carl Steidley, Alexey Sadvski, Rafik Bachnak, Kelly Torres (Texas A&M University, USA)</i>	59
Scalability of Agent-Based Onion Routing Network <i>Ronggong Song and Larry Korba (National Research Council of Canada, Canada)</i>	65
Fire Emergency Building Evacuation: A Computer Simulation Model <i>Mohammed E. Haque and Shashikala Balasubramanian (Texas A&M University, USA)</i>	70
Efficient Parallel Simulation of Direct Methanol Fuel Cell Models <i>S. Rajasekaran, R. Ammar, K. Reifsnider, L. Achenie, A. Mohamed, G. Zhang, and M. Ahmed (University of Connecticut, USA)</i>	75
Virtual Ethnography: a Computer-Based Approach <i>Natalie Ardet (Freie Universität Berlin, Germany), Matthias Thome (Universität des Saarlandes, Germany)</i>	79

COMPUTING PRACTICE AND APPLICATION

An Application of Knowledge Discovery Techniques on Stock Market <i>Yihua Philip Sheng, Wen-Chi Hou (Southern Illinois University, USA), Zhong Chen (Shanghai Jiao Tong University, China)</i>	83
A Flexible Integration Model for Web-based E-Commerce Transactions <i>Chima Adiele and Sylvanus A. Ehikioya (University of Manitoba, Canada)</i>	87
RPM: A Remote PC Power Management Tool <i>Thao Phuong Nguyen and Du Zhang (California State University, USA)</i>	92
A Tool for Text Summarization <i>Ateendra Sudarshak Balasingham and Du Zhang (California State University, USA)</i>	96
A Platform for Studying and Facilitating Two-Handed Interaction <i>Tong Du (VirtualScopics, LLC, USA) and Michael Wainer (Southern Illinois University, USA)</i>	100
Real Time Fabric Fault Detection <i>A. Abdel-raouf, R. Ammar, H. Sholl (University of Connecticut, USA), S. Nassar (Electronic Research Institute, Egypt)</i>	105

SOFTWARE ENGINEERING & CASE

Metamodel Code Generation for a Model Driven Architecture <i>Stefan Mitterdorfer, Egon Teiniker, Christian Kreiner (Graz University of Technology, and Salomon Automation GmbH, Austria), Zsolt Kovács (Salomon Automation GmbH, Austria), and Reinhold Weiss (Graz University of Technology, Austria)</i>	109
A Test Case Generator for Three-variable Functions: Object-Oriented Design and Implementation <i>Narayan Debnath, Joshua Wilson and Joseph Cropper (Winona State University, USA), Mark Burgin (University of California, USA), Hamid Abachi (Monash University, Australia)</i>	113

Measuring Software Maintenance <i>M. Burgin (University of California, Los Angeles, USA) and N. Debnath (Winona State University, USA)</i> ..	118
Qualitative Evaluation of Information Systems Using Kiviat Graphs <i>Cyril S. Ku (William Paterson University, USA)</i>	122
Reasoning in Collaboration Diagrams by Description Logics <i>Hiroyuki Nakanishi, Takao Miura (Hosei University, Japan), Isamu Shioya (Sanno University, Japan)</i>	127
A Deterministic-Heuristic Load Balancing Methodology for MPIAB <i>Meha Sabharwal, Shahram Rahimi, Raheel Ahmad, Ajay Narayanan (Southern Illinois University, USA)</i> .	131
Software Design Method for Agent Systems from Scenarios <i>Kazunori Matsumoto (National Institute of Technology, Japan) and Shinichi Honiden (National Institute of Informatics, Japan)</i>	136

ARTIFICIAL INTELLIGENCE

Reasoning with Negation and Sets <i>James D. Jones (University of Arkansas at Little Rock, USA)</i>	142
A Theory of Probabilistic Decision Making for Intelligent Systems <i>Kazunori Matsumoto and Kenichi Torii (Kanagawa Institute of Technology, Japan)</i>	145
Consequential Intelligent Agent Systems <i>D. L. Hudson (University of California, San Francisco, USA), M. E. Cohen (University of California, San Francisco, USA and California State University, Fresno, USA)</i>	151

ALGORITHMS

Updating Z Ordered Representations of Data Sets <i>Kirk Scott (University of Alaska Anchorage, USA)</i>	155
A Task Graph Set for Evaluation of Reconfigurable Hardware Scheduling Algorithms <i>Sin Ming Loo (Boise State University, USA) and J. D. Winningham (University of Alabama in Huntsville, USA)</i>	159
Parallel Thinning on Rmesh <i>John Jenq (Montclair State University, USA), Wingning Li (University of Arkansas, USA)</i>	164
Alleviation of the Impact of the Apex Nodes on Routing in the Pyramid Structures <i>Zhizhang Shen (Plymouth State University, USA)</i>	168
Convergence Properties of Genetic Algorithms <i>Hong Kyu Lee (Korea University of Technology, Korea) and Gordon K. Lee (San Diego State University, USA)</i>	172
Learning Object Oriented Programming by Creating Visualizations <i>Paul Juell (North Dakota State University, USA), Vijayakumar Shanmugasundaram (Concordia College, USA)</i>	177

INFORMATION SYSTEMS

Decision Tree Induction for Dynamic, High-Dimensional Data Using P-Trees <i>Anne Denton and William Perrizo (North Dakota State University, USA)</i>	184
Building Agent Community for Web Service Integration <i>Cheng-Hsiung Hung and Jason Jen-Yen Chen (National Central University, Taiwan)</i>	188

Annotating Linguistic Data with ImageSpace for the Preservation of Endangered Languages <i>Shiyong Lu, Rong Huang, and Farshad Fotouhi (Wayne State University, USA)</i>	193
A Light-weight Distributed Web Search Engine: Distributed Web Crawling Part <i>Yihua Philip Sheng (Southern Illinois University, USA), Zhong Chen (Shanghai Jiao Tong University, China), Shahram Rahimi, Srinivas Mandalapu (Southern Illinois University, USA)</i>	197

SOFTWARE RELIABILITY

Fault-Tolerance Implementation on P2P Data Mining <i>Rex E. Gantenbein, Jung Yeop Kim (University of Wyoming, USA), Chang Oan Sung (Indiana University Southeast, USA), Charlie Y. Shim (South Dakota State University, USA)</i>	201
Reliable High-Speed Communication Module for Linux Cluster File System Using M-VIA <i>Sung Shin and ChanGon Yoo (South Dakota State University, USA) and Chih-Cheng Hung (Southern Polytechnic State University, USA)</i>	205
Ickpt: An Efficient Incremental Checkpointing Using Page Writing Fault - Focusing on the Implementation in Linux Kernel <i>Sangjo Yi, Junyoung Heo, Yookun Cho (Seoul National University, Korea), Jiman Hong (Kwangwoon University, Korea), Jongmoo Choi (Dankook University, Korea) and Gangil Jeon (Korea Polytechnic University, Korea)</i>	209
A Methodology for Developing an Adjustable Security Design Metric by Mapping Software Testing into Security Testing <i>Charlie Y. Shim (South Dakota State University, USA), Chang Oan Sung (Indiana University Southeast, USA), Jung Y. Kim (University of Wyoming, USA) and Jinoo Park (SemoLogic, Inc., USA)</i>	213
Reliable Transformation between Java RMI and CORBA Programs <i>Haklin Kim (East Stroudsburg University of Pennsylvania, USA)</i>	216
Pre-fetching and Pre-releasing Based LRU for Efficient/Reliable Cache Management <i>Younghun Ko, Hyunseung Choo, and Jaehyoun Kim (Sungkyunkwan University, Korea)</i>	220
Dynamic Cache Partition Strategy for Reliable Buffer Cache Management <i>Jaesun Jin, Hyunseung Choo, and Jaehyoun Kim (Sungkyunkwan University, Korea)</i>	224
Reliable Ontology Enhanced Medical Information Retrieval <i>Injoo Jeong, Louis Green (East-West University, USA), Yeongkwun Kim (Western Illinois University, USA), and Martha W. Evens (Illinois Institute of Technology, USA)</i>	229

COMPUTER ARCHITECTURE & VLSI

Artificial Neural Network-Based Human Target Detection Using Noninvasive Penetrating Radar Data <i>John M. Weiss, Chad Hartsel (South Dakota School of Mines and Technology, USA), Bernt Askildsen, Scott Thompson (RealTronics Corporation of the Black Hills, USA)</i>	233
Application of Process Control for Improving Performance of FMS Systems Using X-Tree Multibus Advanced Parallel Computer Systems <i>Hamid R. Abachi (Monash University, Australia), M.A. Abdollahian (Monash University and RMIT University, Australia), Narayan C. Debnath (Winona State University, USA)</i>	237
History Abstractions of a Sequential Memory Component <i>Walter Dosch and Annette Stümpel (University of Lübeck, Germany)</i>	241

An FPGA-Based Area Efficient Tri-port Registerfile Design for RISC-Style Processor Implementations <i>David Jeff Jackson, William A. Stapleton, Kenneth G. Ricks, David Minor (The University of Alabama, USA)</i>	248
--	-----

The Instruction Execution Mechanism for Responsive Multithreaded Processor <i>Tstomu Itou, Nobuyuki Yamasaki (Keio University, Japan)</i>	252
---	-----

Optically Interconnected Intelligent RAM Multiprocessor: Gigascale Opto-IRAM <i>Chung-Seok (Andy) Seo, Abhijit Chatterjee and Timothy J. Drabik (Georgia Inst. of Technology, USA)</i>	256
--	-----

SPA: A Scalable Per-Address Branch Predictor <i>Angkul Kongmunvattana and Ekkasit Tiamkaew (University of Nevada Reno, USA)</i>	261
---	-----

COMPUTER VISION, ROBOTICS, & MULTIMEDIA

An Intelligent Automated Surveillance System for Parked Vehicles <i>Josh Hight and Chenyi Hu (University of Central Arkansas, USA)</i>	266
--	-----

Functionally Distributed Control Architecture for Robot Systems <i>Tetsuya Taira, Nobuyuki Yamasaki (Keio University, Japan)</i>	270
--	-----

Capacity Analysis of Scheduled Video Delivery Service <i>Wei Shu and Min-You Wu (The University of New Mexico, USA)</i>	274
---	-----

DATABASE

Efficient Ranking of Keyword Queries Using P-trees <i>Fei Pan, Imad Rahal, Yue Cui, William Perrizo (North Dakota State University, USA)</i>	278
--	-----

Component Specification to test Component-based Software <i>Supaporn Kansomkeat, Wanchai Rivepiboon (Chulalongkorn University, Thailand)</i>	282
--	-----

Data Sharing over the Internet and Web under ADO.NET <i>David Zhang and Gongzhu Hu (Central Michigan University, USA)</i>	286
---	-----

Multi-dimensional Nearest Neighbor Search with Non-Uniform Data Sets <i>Yongsong Shi, Wen-Chi Hou, and Chih-Fang Wang (Southern Illinois University, USA)</i>	290
---	-----

Object-Oriented Implementation of a Rule-Based System for XML Query Optimizer <i>Dunren Che (Southern Illinois University, USA)</i>	294
---	-----

Performance Analysis of Two-Phase Locking: Data Contention vs. Resource Contention <i>Yu Wang, Wen-Chi Hou, Chih-Fang Wang, Dunren Che (Southern Illinois University, USA)</i>	298
--	-----

OPERATING & DISTRIBUTED SYSTEMS

Garbage Collection Schemes for Shared Memory Multiprocessors <i>Khayri A. Ali (Oct. University for Modern Science and Arts, Egypt), Fatma A. Omara (Cairo University, Egypt), and Osama A. Elshakankiry (Minufiya University, Egypt)</i>	302
--	-----

Locating Services for Intelligent Mobile Agents <i>Lei Song and Xining Li (University of Guelph, Canada)</i>	308
--	-----

Nearly Dynamic Task Model Scheduling with Aperiodic Tasks <i>Haesun K. Lee, Ilhyun Lee (University of Texas of the Permian Basin, USA)</i>	313
--	-----

Design Automation Method for Software Development in Complex Embedded Systems <i>Ying Qiao, Luqi, Lynn Zhang (Naval Postgraduate School, USA)</i>	317
---	-----

A Distributed Multiagent Architecture Representing a Virtual Marketplace <i>Sherif Elfayoumy, Stanley Jefson, and Sanjay Ahuja (University of North Florida, USA)</i>	321
Comparative Evaluation of Fair-Share CPU Scheduling Algorithms Under Multiprogrammed Workloads <i>Angkul Kongmunvattana and Clifton A. Frazier (University of Nevada Reno, USA)</i>	325

COMPUTER NETWORKS

Mechanism Design for Proxy Placement on Overlay Networks <i>Min-You Wu and Wei Shu (The University of New Mexico, USA)</i>	330
A UML-Based Approach for Testing Web Applications <i>Manish Nilawar, Sergiu Dascalu (University of Nevada, Reno, USA)</i>	334
ImageSpace: an Image Ontology Creation and Annotation Tool for the Semantic Web <i>Rong Huang, Shiyong Lu, and Farshad Fotouhi (Wayne State University, USA)</i>	340
A Dynamic Intermobile Host Bridging Protocol <i>Elsa Valeroso Poh (Eastern Michigan University, USA) and Jody Grassel (University of North Dakota, USA)</i>	344
Optimal Trees for the Parametric Fixed Charge Shortest Paths Problem <i>Fred J. Rispoli (Dowling College, USA) and Steven Cosares (Hofstra University, USA)</i>	348

DATA COMMUNICATION

An Efficient Multicast Routing Scheme For Cellular Networks <i>Y. Cao, N. Mogharreban (Southern Illinois University, USA), Z. Liu (Southeast Missouri State University, USA), and B. Gupta (Southern Illinois University, USA)</i>	352
Location Discovery in Ad Hoc Sensor Networks <i>Seungjin Park and Anshu Bhatia (Michigan Technological University, USA)</i>	358
An Efficient Dynamic Clustering Protocol for MANET <i>V. Doraiswamy, R. Jandhyala, and B. Gupta (Southern Illinois University, USA)</i>	362
An Object-Oriented Approach to Support Faster Retrieve and Manipulation of Spatial Data <i>M. S. Hossain (Chittagong University, Bangladesh), M. Alamgir and M. S. Hossain (International Islamic University, Bangladesh)</i>	368
Cachecast Networks and its Proxy Placement <i>Min-You Wu, Yan Zhu, and Wei Shu (The University of New Mexico, USA)</i>	374
Assessment of Compression Effects on Digital Microscopic Images of Tumor Samples <i>Yushan Li, Yuriy Gusev, Zoltan Laszik, Son Do, Daniel Brackett, Yongshen Ni, John Y. Cheung (University of Oklahoma, USA)</i>	378
A Real-Time Ad Hoc Packet Matching Technique for Hardware-Based Network Intrusion Detection Systems <i>Wei-Ming Lin, Ramu Madhavaram, Parimal Patel, Fred Hudson (The University of Texas at San Antonio, USA)</i>	382