

22nd International Conference on Computer Applications in Industry and Engineering 2009

(CAINE-2009)

**San Francisco, California, USA
4-6 November 2009**

Editors:

D. Che

ISBN: 978-1-61567-666-8

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© (2009) by the International Society for Computers and Their Applications
All rights reserved.

Printed by Curran Associates, Inc. (2009)

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

22nd International Conference on Computers and Their Applications In Industry and Engineering (CAINE-2009)

**November 4 - 6, 2009
Hilton San Francisco Fisherman's Wharf
San Francisco, California USA**

TECHNICAL PAPER INDEX

SOFTWARE SECURITY

Visualization of Network Security Traffic using Hexagonal Self-Organizing Maps <i>Chet Langin, Dunren Che, Michael Wainer, and Shahram Rahimi (Southern Illinois University, USA)</i>	1
Pandemic Virus Spreading Simulator <i>Adina Morariu, Honoriu Vălean, and Camelia Avram (Technical University of Cluj-Napoca, Romania)</i>	7
Self-Protection against Attacks in an Autonomic Computing Environment <i>Guangzhi Qu, Osamah A. Rawashdeh (Oakland University, USA) and Salim Hariri (The University of Arizona, USA)</i>	13
A Space-Efficient Approach to Consistency Check of Firewall Rules <i>Wei Li (Nova Southeastern University, USA)</i>	19
Quality of Security Service in a Virtual Private Network <i>Yan Bai (University of Washington Tacoma, USA), Angkul Kongmunvattana and Soujanya Kantubukta (Columbus State University, USA)</i>	25

IMAGE PROCESSING

Adaptive Fuzzy Inference for Edge Detection Using Compander Functions and Linear Fitness Function Transformations <i>Gordon K. Lee (San Diego State University, USA) and Edward Grant (North Carolina State University, USA)</i>	30
3D Scans of AS-Built Street Scenes in Taipei <i>Naai-Jung Shih, Chia-Yu Lee, Shih-Wei Jhan, Yong-Fong Jhao, and Guan-Syun Wang (National Taiwan University of Science and Technology, Taiwan)</i>	36
Wavelet Based Regularized Deconvolution for Digital Images <i>Pradeep Kumar, Devinder Pathania, Sandeep Kumar Singla (Guru Nanak Dev Engg College, India) and Jatinder Singh Tathgir, G.H.G. Khalsa College, Gurusar, India)</i>	42

MODELING AND SIMULATION

Job Planning and Simulation in a Digital Factory Environment <i>Helge Hemmer (University of Wuppertal, Germany), Thorsten Kisner (AHT Group AG, Germany), Sebastian Meiser and Wolfgang Kühn (University of Wuppertal, Germany)</i>	48
Performance Analysis and Parallelization of Simulink Models <i>Joshua D. Tyson, Ryan A. Kellar, Johnathan S. Corley, Kenneth G. Ricks, and David J. Jackson (University of Alabama, USA)</i>	54
Speedup Techniques for Simulink Model Execution <i>Ryan A. Kellar, Joshua D. Tyson, Johnathan S. Corley, Kenneth G. Ricks, and David J. Jackson (The University of Alabama, USA)</i>	62
D-RNA: Towards a DDoS Resistant Network Architecture using Social Network Analysis <i>Mohammad Iftekhar Husain and Ramalingam Sridhar (University at Buffalo, SUNY, USA)</i>	69
Optimum Simulation of 2-Dimensional Torus Networks <i>Chang-Shyh Peng (California Lutheran University, USA) and Daisy F. Sang (Cal Poly Pomona, USA)</i>	75

APPLICATIONS

Modeling of Hot Rolling Industrial Process Using Fuzzy Logic <i>Alaa Sheta (Electronics Research Institute, Egypt), E. Öznergiz (Istanbul Technical University, Turkey), M. A. Abdelrahman (Tennessee Technological University, USA), and R. Babuška (Delft University of Technology, The Netherlands)</i>	81
Modeling An Adaptable Memory Controller <i>Gary Thorpe and Nagi Mekhie (Ryerson University, Canada)</i>	87
Multi-Level Power Management Policy for Multi-Core Chips <i>Wael Kdouh (Southern Methodist University, USA) and Hesham El-Rewini (University of North Dakota, USA).....</i>	93
Fault Tolerance in Parallelizing Three-Dimensional Particle-In-Cell Plasma Simulation <i>Abdelmageed Elsadek Abdelrazek (College of Business Administration, Saudi Arabia)</i>	102
Business Process Optimization by Workflow Analysis <i>Ahmad H. Shraideh and Hervé G. Camus (Ecole Centrale de Lille, France), and Pascal G. M Yim (PICOM, France)</i>	108
Floorplan Optimization for Hierarchical VLSI Design <i>Chia-Pin R. Liu (Jackson State University, USA)</i>	114
2.5GHz Low Power CMOS Cross-Coupled VCO with High Linearity and Wide Tuning Range <i>Lu Wang and Prasanta Ghosh (Syracuse University, USA)</i>	120
Design of a Hierarchical Principal Component Analysis System for Field Intrusion Detection <i>Aleksey Y. Ashikhmin, James H. Graham, Ahmed H. Desoky, and Benjamin Arazi (University of Louisville, USA)</i>	125
FPGA-Based MPEG-4 Video Encoder SOPC Design with Performance Acceleration of Motion Estimation Block <i>Seemantini Majgaonkar and Omar Elkeelany (Tennessee Technological University, USA)</i>	133
Traffic Engineering in Static Routing Using Multiple Static Route Configuration Scheme <i>Hartinder Singh Johal (Lovely Professional University, India)</i>	139

SOFTWARE ENGINEERING

Using Ponder as a Standard Security Specification Language in Heterogeneous Networks <i>Raouf Alomainy and Wei Li (University of Alabama in Huntsville, USA)</i>	145
A Framework for Structured Search of Distributed Research Resources <i>Anthony W. Wallace and Rex E. Ganterbein (University of Wyoming, USA)</i>	151
Comparison of JSON and XML Data Interchange Formats: A Case Study <i>Nurzhan Nurseitov, Michael Paulson, Randall Reynolds and Clemente Izurieta (Montana State University, USA)</i>	157
Sentiment Analysis of Surveys using both Numeric Ratings and Text Comments <i>Gongzhu Hu (Central Michigan University, USA)</i>	163
Proposal of Predictive Coding Using Error Convergence-type Neuron Network System <i>Shunsuke Kobayakawa and Hirokazu Yokoi (Kyushu Institute of Technology, Japan)</i>	169
Digital PreProcessing of Speech for Feature Identification <i>Reva Freedman, Adam Scovel and Lichuan Liu (Northern Illinois University, USA)</i>	175
Software Estimating, Flexibility and Principled Negotiation <i>Kalman C. Toth (Portland State University, USA)</i>	180
A Model for Learning Words in a Language by Crawling the Web <i>Jeffrey J. Thomson (Sygys.com, USA) and Rex E. Ganterbein (University of Wyoming, USA)</i>	183
Parallel Quasi-Newton Optimization using Graphics Processing Units <i>Kreshna Gopal, Liuxia Wang and Steven Washington (Sentrana, Inc., USA)</i>	189
Isolation as a Threat Reduction Strategy for Super-Systems <i>Robert G. Eyer, Ramesh K. Karne and Alexander L. Wijesinha (Towson University, USA)</i>	195

SPECIAL SESSION on SOFTWARE and APPLICATIONS

Mechanically Generating and Executing Test Cases - Preliminary Design and Implementation of a Tool <i>MM F. Bari and Narayan C. Debnath (Winona State University, USA), Ilhyun Lee and Haesun K. Lee (University of Texas of the Permian Basin, USA)</i>	201
Constant Splitting of Instructions Applied to Embedded Systems for Code Compression <i>MM F. Bari and Narayan C. Debnath (Winona State University, USA)</i>	207
Clustering Customer Transactions: A Rough Set Based Approach <i>Arunava Saha, Darsana Das, Dipanjan Karmakar, Dilip Dubey, Anirban Sarkar (National Institute of Technology-Durgapur, India) and Narayan C. Debnath (Winona State University, USA)</i>	213
On Formalizing UML 2.0 Activities: Stream and Exception Parameters <i>Sabine Boufenara, Faiza Belala (Mentouri University of Constantine, Algeria) and Narayan C. Debnath (Winona State University, USA)</i>	219

BIOINFORMATICS

In Silico White Blood Cell: A Synthetic Model of Leukocyte Rolling, Activation, and Adhesion During Inflammation	.....	225
<i>Jonathan Tang and C. Anthony Hunt (University of California, San Francisco, USA)</i>		
Build a Promoter Motif Database for System Biology Research	.....	231
<i>Carlos Cortes and Yi Lu (Prairie View A&M University, USA)</i>		
Computational Methods for Personal Healthcare	.....	237
<i>Donna L. Hudson and Maurice E. Cohen (University of California, San Francisco, USA)</i>		
An Integrated DNA Support System for Crime Investigations: DNA Tracers	.....	243
<i>Noor Maizura Mohamad Noor and Razif bin Baital@Latif (University Malaysia Terengganu, Malaysia)</i>		

COMMUNICATION NETWORKS

Double Secrecy: An Enhanced Cryptographic Approach for SCADA System Security	.....	249
<i>Waleed H. El-said and James H. Graham (University of Louisville, USA)</i>		
Data Broadcast Scheduling with Multiple Channels	.....	254
<i>Ziping Liu (Southeast Missouri State University, USA) and Bidyut Gupta (Southern Illinois University Carbondale, USA)</i>		
Multi-channel Multiplexed Stand-alone Audio Data Acquisition System: The effect of settling time on acquisition accuracy	.....	260
<i>Mohammed Abdallah and Omar Elkeelany (Tennessee Technological University, USA)</i>		
Communication Reduction Techniques for Application-Specific Traffic in Mesh Networks	.....	266
<i>David Surma (Indiana University South Bend, USA)</i>		

EDUCATION

Creating a Virtual Science Center - Virtual DUSEL (vDUSEL)	.....	272
<i>Stephen Krebsbach, Steve Graham (Dakota State University, USA), Judy Vondruska and George Hamer (South Dakota State University, USA)</i>		
Predicting Likelihood of Undergraduate Students graduating with Honors	.....	278
<i>Jonathan M. Graham, Janice Smith and Cheryl Hinds (Norfolk State University, USA)</i>		
Visualization Tools for Understanding a Complex Code from a Real Application	.....	284
<i>Fernanda Campos, Estban Cortazar, Yadran Eterovic, Leonardo Ramirez, Cristian Tejos, and Pablo Irarrazaval (Universidad Catolica de Chile, Chile)</i>		