

29th International Conference on Computer Applications in Industry and Engineering (CAINE 2016)

Denver, Colorado, USA
26-28 September 2016

Editors:

Gongzhu Hu

Takaaki Goto

ISBN: 978-1-5108-2896-4

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© (2016) 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: 978-1-943436-04-0 (Out of Print)
Reprint ISBN: 978-1-5108-2896-4

Printed by Curran Associates, Inc. (2016)

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

International Society for Computers and Their Applications
64 White Oak Court
Winona, MN 55987
USA

Phone: (507) 458-4517

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: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

Table of Contents

Keynote	1
Implementing a Wireless Geophysical Sensor Network <i>Tracy Camp</i>	1
Bioinformatics & Healthcare	3
Experimental Study of the Effect of Different Scanning Patterns for Blood Smear Analysis <i>Khaled El Bannan, Mostafa M. A. Mohamed, Behrouz H. Far, Christopher Naugler</i>	3
A New Scatter Plot Stress Evaluation Method Using Photo-Plethysmography <i>Minami Tsuchiya, Michio Yokoyama</i>	9
Complex Data Analysis in Biomedical Applications <i>Donna L. Hudson, Maurice E. Cohen, Samuel E. Hudson</i>	17
Extending Watershed Segmentation Algorithms for High-Throughput Phenotyping <i>Mitchell L. Neilsen, Shravan D. Gangadhara, Trevor Rife</i>	23
Software Engineering & Information Systems	29
A Hierarchical Precedence Concurrency Control Protocol for High Data Contention Database Environments <i>Weidong Xiong, Mohammed Hamdi, Feng Yu, Wen-Chi Hou</i>	29
RAID on a Heterogeneous Disk Array <i>András Fekete, Elizabeth Varki</i>	37
Modify Bayesian Network Structure with Inconsistent Constraints <i>Yi Sun, Yun Peng</i>	43
IEEE754 Floating Point Bound Intervals for static analysis of JavaScript Programs <i>Astrid Younang, Lunjin Lu</i>	49
Control Systems & Distributed Systems	55
Minimizing Averaged Error For Dynamic Matrix Control <i>Samer Mansour, Jalal Karam</i>	55
Digital Control of PWM Systems for LED Application Using One-Cycle Averaging <i>Mohammed S. Al-Numay</i>	59
An Emergency Message Propagation System Using Roadside Units and Vehicle-To-Vehicle Communication <i>Besat Zardosht, Steven S. Beauchemin, Michael A. Bauer</i>	65
Levenberg-Marquadt Algorithm tuned Gradient Descent-based Model Reference Adaptive Control Scheme <i>Ka C Cheok, Ana Farhat, Sangeetha Prakasam, Narendra Kintali</i>	73
Adaptive Cost Optimization and Fair Resource Allocation in Computational Grid Systems <i>Satish Penmatsa, Gurdeep S. Hura</i>	79
Computer Security	85
Verifying SCADA Security in Industrial Control Systems <i>Mehdi Sabraoui, Jeff Hieb, James Graham</i>	85
An Information Security Framework for Services of M-Government from Peruvian Local Governments <i>Manuel Tupia, Mariuxi Bruzza</i>	91

A Prototype Development of a Declarative Approach for Computer System Security <i>Yun Bai, Edward Caprin, Yan Zhang</i>	99
Weightage Based Clustering for Energy Efficient Mobile Data Offloading <i>Parag Kumar Guha Thakurta, Spandan Chowdhury, Arun Pandey, Swapan Bhattacharya, Subhansu Bandyopadhyay</i>	105
Computers in Education	111
A Scientific Approach to Chinese Characters: Rationale, Ontology and Application <i>Antoine Bossard, Keiichi Kaneko</i>	111
Visualization for Database Algorithms <i>Ying Jin, Vijetha Ramu</i>	117
Undergraduate Research and Experiments in Robotics-Based Accomplishments for STEM Education <i>Seung-Yun Kim, Reza Mirdamadi, Osman Guzide</i>	123
Co-Curricular Activities for Soft Skills and Underserved Minority Student Success <i>Meline Kevorkian, Greg Simco</i>	129
Computer Networks	133
A Cyber-Robust Connected Control System: Experimental Validation <i>Charles Kim, Ravindranath Jaglal</i>	133
Cybersecurity Testbed Experimentation of a Resilient Control System for Power Substations <i>Charles Kim, Karen Green, Andre Duarte Palhares</i>	139
Methods to Improve Capacity in Grid Networks <i>Amalya Mihnea, Mihaela Cardei</i>	145
Combining Host and Network-based Intrusion Detection System to Mitigate Insider Threat <i>Ajay K Katangur, Somashekar Akkaladevi, Dulal Kar</i>	151
A Comparative Evaluation of Trust Models in P2P Networks <i>Wei Li</i>	159
Human-Computer Interface & Image/Signal Processing	165
A Unified Approach for Arabic Language Dialect Detection <i>Rania R. Ziedan, Michael N. Michael, Abdulwahab K. Alsammak, Mona F.M. Mursi, Adel S. Elmaghraby</i>	165
Development of Breast Abnormality Detection System with Colors Based on the Wavelet Decomposition Technique <i>Maha Ali, Magdi B. M. Amien</i>	171
A Study of Scientific Application Interfaces and a Proposed GUI for Brain Signal Processing <i>Catherine Stringfellow, Tina Johnson, Richard Simpson, Michael Grayson, Michael Ellerkamp, Ali Khalid, Uri Easter, Cavaughn Browne</i>	179
An HCI Study on I/O Devices using Hand-Eye Coordinated Tasks <i>Rojin Aliehyaei, Angkul Kongmunvattana</i>	185
Data Mining	191
Parallel K-Means Clustering with Triangle Inequality <i>Rachel Krohn, Christer Karlsson</i>	191
Knowledge Discovery Using Unsupervised Learning Techniques: A Case Study on Canadian Crime and Income Data <i>Neil Hanak, Mitchell Koens, Kevin Saforo, Mohamad El-Hajj</i>	197
A Graph-based Patent Evolution Model using Summarization and Patent Relationships <i>Lun-Chi Chen, Yu-Chiu Chen, Jyun-Yao Huang, I-En Liao</i>	203
Infrastructure and Comparative Analysis of Stock Price Forecasting Techniques <i>Antonio M.H. Punzo, Ower M. Rosier, George Dimitoglou</i>	211
Sentiment Analysis of Tweets on 2016 US Presidential Election Candidates <i>Gongzhu Hu, Snehitha Kodali, Anusha Padamati</i>	219

Computer Architecture, Mobile, Scientific Computing	227
Parallelizing Genetic Algorithms with GPGPU	
<i>John Weiss</i>	227
Discussion of RAMCloud Storage Based on NUMA Architecture	
<i>Jian Zhang, Mei Wang, Huanmei Wu</i>	233
NUMA Memory Arrangement by Using BW-SA	
<i>Jian Zhang, Mei Wang, Huanmei Wu</i>	239
Improvement and Implementation of Interactive Graph Cut Algorithm	
<i>Zhiyi Fang, Wenzeng Huang, Yukang Tian, Cheng Ding</i>	245
Access Control Model of Enterprise Instant Messaging System Based on RSA	
<i>Xiaoyun Liu, Zhiyi Fang, Xinda You, Xiaoyue Liu</i>	251
Author Index	255