31st International Conference on Computer Applications in Industry and Engineering (CAINE 2018)

New Orleans, Louisiana, USA
8 – 10 October 2018

Editors:

Yan Shi
Takaaki Goto
Gongzhu Hu

ISBN: 978-1-5108-7125-0

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© (2018) 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: 978–1–943436–12–5 (Out of Print)
Reprint ISBN: 978-1-5108-7125-0

Printed by Curran Associates, Inc. (2018)

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**

Similarity Searches on Non-ordered Discrete Data for Emerging Computer Applications: Why and How
Qiang Zhu 1

Security and Networks **3**

Composition of Cyberattack Models
Katia P. Mayfield, Mikel D. Petty, John A. Bland, Tymaine S. Whitaker 3

Cybersecurity for Industrial Control Systems: Progress and Challenges
James Graham, Jeffrey Hieb, Patricia Ralston 9

Dynamic Load Balancing in Heterogeneous Computing Systems With Central-Server Node Model
Satish Penmatsa, Gurdeep Hura 14

Reliable Multicast Protocol Using Infiniband Remote Direct Memory Access
Shah Mansoor, J. Michael Meehan 20

Machine Learning Algorithms **26**

Estimation of Correlation between Multiple Parameters and Sleep Satisfaction Using Deep Neural Network for Pleasant Sleeping Support System
Seung-Il Cho, Muneki Yasuda, Minami Tsuchiya, Tomochika Harada, Atsushi Tanaka, Michio Yokoyama 26

A Three-Stage Object Detection Framework Using Compact Features and Deep CNN
Liang Peng, Hao Qian 31

Real-time Action Recognition with Deep Features and Dissimilarity-based Training of Specialized Module Networks
Marian K. Y. Boktor, Ahmad Al-Kabbany, Radwa Khalil, Said El-Khamy 38

A Seed Segmentation Contour Generator and Counter
Chaney Courtney, Mitchell Neilsen 45

Artificial Intelligence: Applications **53**

Automatic Red-Eye Detection in Consumer Photographs
Liang Peng, Hao Qian 53

Towards Modeling Gestures for Non-Emotional Conversational Interaction by Humanoid Robots
Aditi Singh, Arvind K. Bansal 59

Proximal Search of Image Segments in CBIR
Umer Rashid, Muhammad Afzal Bhatti, Mubashar Mushtaq 65

Route Search Method for Autonomous Mobile Robots Using Machine Learning
Mitsuo Wakatsuki, Seiya Okubo, Tetsuro Nishino 71

Computer Applications **77**

The Design and Development of a Web-based Ticket Management Solution using PhoneGap
Quan Yuan, Melody Snitker, Haesun Lee, Ilhyun Lee 77

Flexible Architecture for Analysis of Water Control Structures
Chendi Cao, Mitchell Neilsen 83

Measuring Method of Volume Condition for Music Listening Experiment Using Equal-Loudness-Level Contours
Tomoki Maeda, Teruhisa Hochin, Hiroki Nomiya 89

Practical Guide for the Implementation of Electronic Government Aligned with Peruvian Regulation
Mariuxi Bruzza, Manuel Tupia 97

Data Mining **104**
Influence Modeling, Volume Prediction and Sentiment Analysis of Short Texts on Twitter
Trung T Nguyen, Amartya Hatua, Asheshbabu Pothuraju, Andrew H Sung 104
GLCM based Skin Diseases Classification using Texture Features
Zafar Iqbal, Saqib Iqbal, Mubashar Mushtaq, Ghazanfar Farooq, Khalid Saleem 112
Data Mining Applications on Biomechanical Data
Patrick Rider, Qin Ding 118
Effect of Reality of Pictures in a Horror Game on Feelings of Fear
Kotoko Yamaguchi, Teruhisa Hochin, Hiroki Nomiya, Yukiko Nishizaki 124

Software, Tools and Applications **132**
Artificial Intelligence Techniques in Cancer Diagnosis- Approach to Healthcare
Jaskarn Singh, Narayan Debnath 132
Computer Based Career Guidance: An Ontology Use for Student Profiling
Mohammed Abdellah Alimam, Hamid Seghiouer, Mohammed Amine Alimam, Mohammad Cherkaoui, Nasereddin Hebah 138
Creating a Compiler Optimized Inlineable Implementation of Intel SVML SIMD Intrinsics
Promyk Zamojski, Raafat Elfouly 146
System Architecture of Mobile Application for Emergency Medical Situation and Continuous Monitoring
Rashmi Mandal Vijavyvergiya, Partha Ghosh, Lalmohan Dutta, Runa Ganguli, Narayan Debnath, Soumya Sen 152
F2BPM: A Framework to Evaluate the Quality of Conceptual Models of Business Processes
Narayan Debnath, Carlos Salgado, Mario Peralta, Daniel Riesco, Lorena Baigorria, Germán Montejano, Iihyun Lee, Haesun Lee 157

Software Engineering **163**
Architecture for Self-Sovereign Ditigal Identity
Kalman C. Toth, Alan Anderson-Priddy 163
Effective Practices for Refactoring a Legacy Java Application into a Microservice Architecture
Fabio M. Manzano, Mario A. T. Buratto, Amadeu Bonfante, George H. R. Costa, Thomas Phelan 169
Defect Classification and Analysis in a Small Company
Eric Abuta, Jeff Tian 175
Miner and Jeweler: Experience of Teaching an Online Mobile App Development Course
Ziping Liu, Xuesong Zhang 183

Machine Learning Applications **189**
Improvement of Similar Image Retrieval Considering Temporal Changes of Music Impression
Yuto Shinjo, Teruhisa Hochin, Hiroki Nomiya 189
Automated Classification System of Giant White Corn using Image Processing and Supervised Techniques
Gabriela Gónzales, Juan Gutiéerrez-Cáardenas 195
Estimation of Plasma Emission Transition Using Clustered Time Series Data
Shota Nakagawa, Teruhisa Hochin, Hiroki Nomiya, Hideya Nakanishi 201
A Trust Model for Bitcoin using Unsupervised Machine Learning
Ahmed Bugalwi, Assad Algarni, Kendall E. Nygard 207

Author Index