

# **25th International Conference on Software Engineering and Data Engineering (SEDE 2016)**

Denver, Colorado, USA  
26-28 September 2016

## **Editors:**

**Frederick C. Harris Jr.**      **Yan Shi**  
**Sergiu Dascalu**

ISBN: 978-1-5108-2897-1

**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© (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: 978-1-943436-05-7 (Out of Print)  
Reprint ISBN: 978-1-5108-2897-1

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

<b>keynote</b>	<b>1</b>
Engineering Model-based Adaptive Software Systems <i>Marin Litoiu</i> .....	1
<b>Software Engineering I</b>	<b>3</b>
Quality Assurance of a Mobile Network Measurement Testbed Through Systematic Software Testing <i>Utkarsh Goel, James Espeland, Upulee Kanewala, Mike P. Wittie</i> .....	3
Privacy Engineering with PAWS: Injecting RESTful Privacy Web Services <i>Peter Bodorik, Dawn Jutla, Ajith Bryn</i> .....	11
Comparative Evaluation of NRDC Web Portal Using Automated Tools <i>Jose T. Painumkal, Sankeerth Ankam, Sergiu M. Dascalu, Frederick C., Jr. Harris</i> .....	17
A Framework to Assess the Effectiveness of Quality Assessment Model Developed Using Class Level Metrics <i>Lov Kumar, Aneesh Krishna, Santanu Kumar Rath, Swapan Bhattacharya</i> .....	23
<b>Data Engineering I</b>	<b>29</b>
Efficient Physical Register File Allocation with Thread Suspension for Simultaneous Multi-Threading Processors <i>Wenjun Wang, Wei-Ming Lin</i> .....	29
Floating-Point Data Compression Using Improved GFC Algorithm <i>Rui Wu, Sergiu M. Dascalu, Lee Barford, Frederick C., Jr. Harris</i> .....	35
Active XACML: An Active Rule-Based System for Security Policies <i>Ying Jin, William Chan</i> .....	41
Data Analysis Performance Comparison between Single-Mode and Multi-Mode <i>Sungchul Lee, Ju-Yeon Jo, Yoohwan Kim</i> .....	47
<b>Interdisciplinary Studies on Software and Data Engineering</b>	<b>53</b>
A First Look at Web Browsing Predictions using DNS Logs <i>Utkarsh Goel, Clint Cooper, Brittany Terese Fasy, Mike P. Wittie</i> .....	53
A Web Interface Usability Evaluation of a Public Collaborative Data Portal <i>Vinh Le, Terence Henriod, Eric Fritzingler, Frederick C., Jr. Harris, Sergiu M. Dascalu</i> .....	61
A High-throughput, Web-based Tool to Determine Protein Hydrogen Bond Number <i>Sunil Gupta, Jiaofei Zhong, Tyler Evans</i> .....	67
Rewind: A Transcription Method and Website <i>Chase Carthen, Vinh Le, Richard Kelley, Tomasz Kozubowski, Frederick C., Jr. Harris</i> .....	73
<b>Software Engineering II</b>	<b>79</b>
An Empirical Study on the Software Quality Evolution Trends of Open Source Software Projects <i>Lerina Aversano, Maria Tortorella</i> .....	79
Encryption on Course Management System Using Rijndael Algorithm <i>Francis Onodueze, Sharad Sharma</i> .....	85
Developers' Perspectives on Architecture Violations: A Survey <i>Ajay Bandi</i> .....	91

Design and Implementation of a Procedural Content Generation Web Application for Vertex Shaders <i>Juan C. Quiroz, Sergiu M. Dascalu</i> .....	97
<b>Data Engineering II</b>	<b>103</b>
The Area Code Tree for Approximate Nearest Neighbour Search in Dense Point Sets <i>Fatema Rahman, Wendy Osborn</i> .....	103
Continuous Region Query Processing in the mqr-tree <i>Wendy Osborn</i> .....	109
Analyzing Patterns of Scientific Collaboration using Centrality Measures and Modularity <i>Adeel Ahmed, Khalid Saleem, Mubashar Mushtaq</i> .....	115
A Bulk-Loading Algorithm for the BoND-Tree Index Scheme for Non-ordered Discrete Data Spaces <i>Dong-Yoon Choi, AKM Tauhidul Islam, Sakti Pramanik, Qiang Zhu</i> .....	123
<b>Software Engineering III</b>	<b>129</b>
Empirically Identifying the Challenges in Parallelizing Scientific Software Systems <i>Saleh Mohamed Alnaeli, Melissa Sarnowski, Calvin Meier, Mark Hall</i> .....	129
An Intelligent Tester: Automated Test Generation and Test Execution through Machine Learning and Natural Language Processing <i>Christopher Bischke, Yue Fung Choy, Ejiroghene Urhiae, John Dibenedetto</i> .....	135
Software Design: Towards a Meta-architecture to Support Decision Making in the Definition of Software Architecture <i>Luis Roqué Fourcade, Liliana Arakaki, Daniel Riesco, Germán Montejano, Narayan Debnath</i> .....	143
Improving Software Engineer Performance in a Cyber-defense Context <i>Narayan Debnath, Roberto Uzal, Daniel Riesco, Germán Montejano, Walter Agüero, Claudio Baieli, Ilhyun Lee, Haesun Lee</i> .....	149
<b>Data Engineering III</b>	<b>155</b>
Pakistan Genetic Disease Database <i>Adeel Ahmed, Khalid Saleem, Mubashar Mushtaq</i> .....	155
Traffic Collision Analysis in Edmonton, Alberta, Canada: A CASE STUDY <i>Mohamad El-Hajj, Lee Josh Humeniuk, Winston Kouch, Stephen Adeniji</i> .....	161
Using Offender Information to Predict Candidates for Parole <i>James Clarke, Curtis Everitt, Derrick Gold, Mohamad El-Hajj</i> .....	169
Generic Error Identification in Data Sets <i>Nadia El Bekri, Elisabeth Peinsipp-Byma</i> .....	177
<b>Author Index</b>	<b>183</b>