



ICSEA 2013

The Eighth International Conference on Software Engineering Advances

October 27 - November 1, 2013

Venice, Italy

ICSEA 2013 Editors

Luigi Lavazza, Università dell'Insubria - Varese, Italy

Roy Oberhauser, Aalen University, Germany

Adriana Martin, National University of Austral Patagonia (UNPA), Argentina

Jameleddine Hassine, KFUPM, KSA

Michael Gebhart, Gebhart Quality Analysis (QA) 82, Germany

Marko Jäntti, University of Eastern Finland, Finland

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© (2013) by International Academy, Research, and Industry Association (IARIA)
Please refer to the Copyright Information page.

Printed by Curran Associates, Inc. (2013)

International Academy, Research, and Industry Association (IARIA)
412 Derby Way
Wilmington, DE 19810

Phone: (408) 893-6407
Fax: (408) 527-6351

petre@iaria.org

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

TABLE OF CONTENTS

ICSEA 1: ADVANCES IN SOFTWARE TESTING I

Kongdroid: A Proposal for a Cloud Service for Stress Testing on Android Applications	1
<i>Leonardo Sodre, Felipe Ferraz, Gustavo Alexandre, Ana Carvalho</i>	
Functional Software Testing: A Systematic Mapping Study	11
<i>Gilmar Ferreira Arantes, Plinio de Sa Leitao-Junior, Auri Marcelo Rizzo Vincenzi, Fabio Nogueira de Lucena</i>	
A Multi-Objective Technique for Test Suite Reduction	18
<i>Alessandro Marchetto, Md. Mahfuzul Islam, Angelo Susi, Giuseppe Scanniello</i>	
Applying Mutation Testing to ATL Specifications: An Experimental Case Study	25
<i>Yasser Khan, Jameleddine Hassine</i>	

ICSEA 2: ADVANCES IN SOFTWARE TESTING II

The Use of Experimentation Packages for Evaluating the Quality of Mobile Software Products	31
<i>Auri Marcelo Rizzo Vincenzi, Gilcimar Divino de Deus, Joao Carlos da Silva, Plinio de Sa Leitao-Junior, Jose Carlos Maldonado, Marcio Eduardo Delamaro</i>	
How Exception Handling Constructions are Tested: An Initial Investigation with Open Source Software	38
<i>Auri Marcelo Rizzo Vincenzi, Joao Carlos da Silva, Plinio de Sa Leitao-Junior, Jose Carlos Maldonado, Marcio Eduardo Delamaro, Marcos Lordello Chaim, Escola de Artes</i>	
Towards Scalable Bug Localization using the Edit Distance of Call Traces	45
<i>Themistoklis Diamantopoulos, Andreas Symeonidis</i>	
Finding Common Subsequences in Recorded Test Cases	51
<i>Martin Filipisky, Miroslav Bures, Ivan Jelinek</i>	

ICSEA 3: ADVANCES IN SOFTWARE TESTING III

Architecture-Based Conformance Testing	55
<i>Elena Leroux, Flavio Oquendo, Qin Xiong</i>	
Combining Model-based Testing and Continuous Integration	65
<i>Martin Koskinen, Dragos Truscan, Tanwir Ahmad, Niklas Gronblom</i>	
Static Analysis Techniques and Tools: A Systematic Mapping Study	72
<i>Vinicius Rafael Lobo de Mendonca, Cassio Leonardo Rodrigues, Fabrizio Alphonsus A. de M. N. Soares, Auri Marcelo Rizzo Vincenzi</i>	
An Approach for Validation, Verification, and Model-based Testing of UML-based Realtime Systems	79
<i>Mehdi Nobakht, Dragos Truscan</i>	

ICSEA 4: ADVANCES IN FUNDAMENTALS FOR SOFTWARE DEVELOPMENT I

Toward a Definition of π-DSL for Modelling Business Agents	86
<i>Charif Mahmoudi, Fabrice Mourlin</i>	
Relationships Between Risks in an IT Project Development Portfolio	94
<i>Rob Kusters, Jort Postema, Jos Trienekens</i>	
A Proposal of Requirements Specification Process for Adaptive Systems Based on Fuzzy Logic and NFR-Framework	100
<i>Joao Dionisio Paraiba, Luiz Eduardo Galvao Martins</i>	
Requirements Elicitation Guide for Embedded Systems: An Industry Challenge	106
<i>Luiz Eduardo Galvao Martins, Jaime Cazuhiro Ossada, Anderson Belgamo, Barbara Stefani Ranieri</i>	
Separation of Concerns and Code Enhancement: Aspect-oriented Programming Versus Customization Approach Followed in Open Source Software	112
<i>Sidra Sultana, Fahim Arif</i>	

ICSEA 5: ADVANCES IN FUNDAMENTALS FOR SOFTWARE DEVELOPMENT II

Design and Innovation in Game Development: Observations in 7 Small Organizations	118
<i>Erno Vanhala, Jussi Kasurinen, Kari Smolander</i>	

An Automatic Petri-net generator for Modeling Multi-agent Systems	128
<i>Meriem Taibi, Malika Ioualalen, Riad Abdmehziem</i>	
Data From Configuration Management Tools As Sources For Software Process Mining	134
<i>Jana Samalikova, Rob Kusters, Jos Trienekens, Ton Weijters</i>	
Refactoring of Simulink Diagrams via Composition of Transformation Steps	140
<i>Quang Minh Tran, Benjamin Wilmes, Christian Dziobek</i>	
Experiences on Mobile Cross-Platform Application Development Using PhoneGap	146
<i>Jussi Ronkainen, Juho Eskeli, Timo Urhema, Kaisa Koskela-Huotari</i>	

ICSEA 6: ADVANCES IN FUNDAMENTALS FOR SOFTWARE DEVELOPMENT III

A Real-Time Design Pattern for Actuators in Advanced Driver Assistance Systems	152
<i>Hela Marouane, Achraf Makni, Claude Duvallet, Bruno Sadeg, Rafik Bouaziz</i>	
Metrics for Measuring Quality of Real-time Design Patterns	162
<i>Saoussen Rekhis, Hela Marouane, Rafik Bouaziz, Claude Duvallet, Bruno Sadeg</i>	
Using a New UML Profile for Modeling Software Tests	169
<i>Andrew Costa, Carlos Lucena, Ricardo Venieris, Gustavo Carvalho</i>	
An Ontology-based System to Support Distributed Software Development	178
<i>Rodrigo G. C. Rocha, Ryan Azevedo, Catarina Costa, Marcos Duarte, Joao Paulo Fechine, Fred Freitas, Silvio Meira, Eduardo Tavares, Daniel Figueredo</i>	
Comparative Influence Evaluation of Middleware Features on Choreography DSL	184
<i>Nebojsa Tausan, Jari Lehto, Pasi Kuvaja, Jouni Markkula, Markku Oivo</i>	

ICSEA 7: ADVANCES IN FUNDAMENTALS FOR SOFTWARE DEVELOPMENT IV

Data Lifecycle Verification Method for Requirements Specifications Using a Model Checking Technique	194
<i>Yoshitaka Aoki, Saeko Matsuura</i>	
Service Relationships Management for Maintenance and Evolution of Service Networks	201
<i>Aneta Kabzeva, Joachim Gotze, Thomas Lottermann, Paul Muller</i>	
Architectural Elements of Ubiquitous Systems: A Systematic Review	208
<i>Carlos Machado, Eduardo Silva, Thais Batista, Jair Leite, Elisa Yumi Nakagawa</i>	
Architectural Decisions in the Development of Multi-Layer Applications	214
<i>Jose Garcia-Alonso, Javier Berrocal Olmeda, Juan Manuel Murillo</i>	
CREATE: A Co-Modeling Approach for Scenario-based Requirements and Component based Architectures	220
<i>Bjorn Schindler, Marcel Ibe, Martin Vogel, Andreas Rausch</i>	

ICSEA 8: ADVANCES IN FUNDAMENTALS FOR SOFTWARE DEVELOPMENT V

Reasoning about UML/OCL Models using Constraint Logic Programming and MDA	228
<i>Beatriz Perez, Ivan Porres</i>	
Weaving Crosscutting Concerns into Inter-process Communications (IPC) in AspectJ	234
<i>Ali Raza, Stephen W. Clyde</i>	
Systematic Modeling of Workflows in Trace-Based Software Debugging and Optimization	241
<i>Salman Rafiq, Adriaan Schmidt</i>	
A Pattern-based Approach towards Expressive Specifications for Property Concepts	249
<i>Geert Delanote, Jeroen Boydens, Eric Steegmans</i>	
Applying Questionnaire to Assess the Lessons Learned Process in Software Project Management: A Case Study at GAIA	258
<i>Marco Ikuro Hisatomi, Anderson de Souza Goes, Rodolfo Miranda de Barros</i>	

ICSEA 9: SOFTWARE DEPLOYMENT AND MAINTENANCE I

Refactoring to Static Roles	265
<i>Fernando Barbosa, Ademar Aguiar</i>	
Linking E-Mails and Source Code Using BM25F	271
<i>Raffaele Branda, Anna Tolve, Licio Mazzeo, Giuseppe Scanniello</i>	
IR based Traceability Link Recovery Method Mining	278
<i>Takeyuki Ueda, Shinpei Ogata, Haruhiko Kaiya, Kenji Kaijiri</i>	
Towards Identifying the Factors for Project Management Success in Global Software Development: Initial Results	285
<i>Mahmood Niazi, Sajjad Mahmood, Mohammad Alshayeb, Abdul Majid Qureshi, Kanaan Faisal, Narciso Cerpa</i>	

ICSEA 10: SOFTWARE DEPLOYMENT AND MAINTENANCE II

A DSL for Multi-Scale and Autonomic Software Deployment	291
<i>Raja Boujbel, Sebastien Leriche, Jean-Paul Arcangeli</i>	
Characterization of Techniques and Tools of Visualization Applied to Software Comprehension: A Systematic Mapping	297
<i>Marllos Paiva Prado, Auri Marcelo Rizzo Vincenzi, Fabrizio Alphonsus A. de M. N. Soares, Felipe Cesar, Guilherme Pereira de Paula, Hugo Alexandre Dantas do Nascimento, Joao Carlos Silva, Juliano Lopes de Oliveira, Lucas Carvalho Lima, Thiago Fernandes</i>	
Managing IT Service Releases in a Systematic Way: A Case Study Approach	304
<i>Marko Jantti, Antti Suhonen, Mika Kurenniemi</i>	

ICSEA 11: AGILE SOFTWARE TECHNIQUES I

Pivots and Architectural Decisions: Two Sides of the Same Medal? What Architecture Research and Lean Startup can learn from Each Other	310
<i>Jan Salvador van der Ven, Jan Bosch</i>	
Moonlighting Scrum: An Agile Method for Distributed Teams with Part-Time Developers Working during Non-Overlapping Hours	318
<i>Davide Taibi, Philipp Diebold, Constanza Lampasona</i>	
An Agile Maturity Model for Software Development Organizations	324
<i>Felipe Soares, Silvio Meira</i>	
Using the Analytical Hierarchy Process as a Ranking Tool for User Story Prioritization Techniques	329
<i>Sultan Alshehri, Luigi Benedicenti</i>	

ICSEA 12: AGILE SOFTWARE TECHNIQUES II

Expert Estimation and Historical Data: An Empirical Study	336
<i>Gabriela Robiolo, Silvana Santos, Bibiana Rossi</i>	
Agile-User Experience Design: an Agile and User-Centered Process?	346
<i>Lou Schwartz</i>	
Distributed Agile Software Development Challenges and Mitigation Techniques: A Case Study	352
<i>Abdullah Saad Alqahtani, John David Moore, David Harrison, Bruce Wood</i>	
Agile-User Experience Design: With or Without a Usability Expert in the Team?	359
<i>Lou Schwartz</i>	

ICSEA 13: AGILE SOFTWARE TECHNIQUES III

Opportunities for Agile Documentation Using Natural Language Generation (IDEA)	N/A
<i>Hakan Burden, Rogardt Heldal, Peter Ljunglof</i>	
Do Agile Principles and Practices Support the Well-being at Work of Agile Team Members?	364
<i>Marja Kansala, Seppo Ilmari Tuomivaara</i>	
The Scrum Product Owner – Customer Collaboration & Prioritizing Requirements: Empirical Research in a Sample of Irish Industry	368
<i>Trish O'Connell</i>	
Benefits and Limitations of Using the MPS.BR Model with Agile Methodologies: A Survey Based on a Systematic Literature Review	373
<i>Robson Amorim de Souza, Fernando Selleri Silva, Felipe Santana Furtado Soares, Silvio Romero de Lemos Meira</i>	

ICSEA 14: SOFTWARE PERFORMANCE

Low-Overhead Profiling based on Stationary and Ergodic Assumptions	380
<i>Stoyan Garbatov, Joao Cachopo</i>	
A Tracking and Visualizing System of Memory Usage along to C Source Programs	387
<i>Kyoko Iwasawa, Takuhiro Okamura</i>	
Run-Time Monitoring of Timing Constraints: A Survey of Methods and Tools	391
<i>Nima Asadi, Mehrdad Saadatmand, Mikael Sjodin</i>	
The Impact of Intra-core and Inter-core Task Communication on Architectural Analysis of Multicore Embedded Systems	402
<i>Juraj Feljan, Jan Carlson</i>	

ICSEA 15: BUSINESS TECHNOLOGY

Cooperative Optimal Route Planning of Accumulator-bank Servicing Robots	408
<i>Ágnes Werner-Stark, Tibor Dulai, Katalin M. Hangos</i>	
Business Architecture for a SME: A Case Study of a Manufacturing Firm in Mexico	414
<i>Alicia Valdez, Carlos Vega, Elias Olivares, Juan Perez</i>	
Confirming Design Guidelines for Evolvable Business Processes Based on the Concept of Entropy	420
<i>Peter De Bruyn, Dieter Van Nuffel, Philip Huysmans, Herwig Mannaert</i>	
Towards Ontology-Driven Approach for Data Warehouse Analysis - Case Study: Healthcare Domain	426
<i>Lama El Sarraj, Bernard Espinasse, Therese Libourel, Sophie Rodier</i>	
Light-PubSubHubbub: A Lightweight Adaptation of the PubSubHubbub Protocol	432
<i>Porfirio Dantas, Jorge Pereira, Everton Cavalcante, Gustavo Alves, Thais Batista</i>	

ICSEA 16: SOFTWARE ENGINEERING TECHNIQUES, METRICS, AND FORMALISMS I

Semantic Symbols Extraction Model for Emergency Hazard Map	439
<i>Lijian Sun, Jie Zhao, Lihong Shi, Zheng Gong, Yi Zhu, Agen Qiu</i>	
Interactive Hyperbolic Tree for Industrial size Software Product line Architecture	445
<i>Abeer Khalid, Salma Imtiaz</i>	
Creating a ITIL-based Software Incident Categorization Model for Measurement: A Case Study	450
<i>Sanna Heikkinen, Antti Suhonen, Mika Kurenniemi, Marko Jäntti</i>	
Implementation of the ITIL-Based Service Level Management Process to Improve an Organization's Efficiency: A Case Study	457
<i>Antti Suhonen, Sanna Heikkinen, Mika Kurenniemi, Marko Jantti</i>	
Measuring the Functional Size of Real-Time and Embedded Software: A Comparison of Function Point Analysis and COSMIC	465
<i>Luigi Lavazza, Sandro Morasca</i>	

ICSEA 17: SOFTWARE ENGINEERING TECHNIQUES, METRICS, AND FORMALISMS II

MCREf: A Metric to Evaluate Complexity of Functional Requirements	471
<i>Carlos Roberto Paviotti, Luiz Eduardo Galvao Martins</i>	
Hierarchical Multi-Views Software Architecture	478
<i>Ahmad Kheir, Mourad Oussalah, Hala Naja</i>	
Study to Secure Reliability of Measurement Data through Application of Game Theory (POSTER)	N/A
<i>Ko Sang-Bok</i>	
Object Oriented Petri Nets in Software Development and Deployment	484
<i>Radek Koci, Vladimir Janousek</i>	
A Measurement-based Approach to Software Development Process Tailoring in R&D Organization	490
<i>Apinporn Methawachananont, Pawarat Nontasil</i>	

ICSEA 18: SOFTWARE ENGINEERING TECHNIQUES, METRICS, AND FORMALISMS III

Towards Probabilistic Models to Predict Availability, Accessibility and Successability of Web Services	497
<i>Abbas Tahir, Sandro Morasca, Davide Tosi</i>	
Measuring Design Quality of Service-Oriented Architectures Based on Web Services	503
<i>Michael Gebhart</i>	
Towards Automatic Performance Modelling Using the GENERICA Component Model	509
<i>Nabila Salmi, Malika Ioualalen, Mehdi Sliem</i>	
Ensuring Consistency of Dynamic Reconfiguration of Component-Based Systems	516
<i>Hamza Zerguine, Nabila Salmi, Malika Ioualalen</i>	
An Investigation on Quality Models and Quality Attributes for Embedded Systems	522
<i>Lucas Bueno Ruas Oliveira, Milena Guessi, Daniel Feitosa, Christian Manteuffel, Matthias Galster, Flavio Oquendo, Elisa Yumi Nakagawa</i>	

ICSEA 19: SPECIALIZED SOFTWARE ADVANCED APPLICATIONS

Counter Rocket, Artillery and Mortar System with Laser Simulation Software	528
<i>Maria Epp, Hendrik Rothe</i>	

Towards Cloud-based Collaborative Software Development: A Developer-Centric Concept for Managing Privacy, Security, and Trust	532
<i>Roy Oberhauser</i>	
Two-Dimensional Models' Processing Using Principles of Knowledge-Based Architecture	538
<i>Andrejs Bajovs, Oksana Nikiforova</i>	
Towards a Smart City Security Model: Exploring Smart Cities Elements Based on Nowadays Solutions	545
<i>Felipe Ferraz, Carlos Sampaio, Carlos Ferraz, Gustavo Alexandre, Ana Carvalho</i>	
Camera Trajectory Evaluation in Computer Graphics Based on Logarithmic Interpolation	550
<i>Mikael Fridenfalk</i>	

ICSEA 20: SOFTWARE ECONOMICS, ADOPTION, AND EDUCATION

Metaphors Applied to Interaction Design in Group Learning	557
<i>Anderson Cavalcante Gonçalves, Deller James Ferreira</i>	
ProDec: A Serious Game for Software Project Management Training	564
<i>Alejandro Calderon, Mercedes Ruiz</i>	
Open Source Legality Compliance of Software Architecture	570
<i>Alexander Lokhman, Antti Luoto, Imed Hammouda, Tommi Mikkonen</i>	
Can Business Process Management Benefit from Service Journey Modelling Language?	578
<i>Eunji Lee, Amela Karahasanovic</i>	

ICSEA 21: ADVANCED DESIGN TOOLS FOR DEVELOPING SOFTWARE

A Method of Generation of Scenarios using Differential Scenario	582
<i>Eiji Shiota, Atsushi Ohnishi</i>	
Towards a UML Meta Model Extension for Aspect-Oriented Modeling	590
<i>Meriem Chibani, Brahim Belattar, Abdelhabib Bourouis</i>	
A Case Study of Requirements Management: Toward Transparency in Requirements Management Tools	596
<i>Markus Kelanti, Jarkko Hyysalo, Antti Valimaki, Pasi Kuvaja, Markku Oivo</i>	
Two-Hemisphere Model Based Approach to Modelling of Object Interaction	604
<i>Oksana Nikiforova, Ludmila Kozacenko, Dace Ahilcenoka</i>	

ICSEA 22: WEB ACCESSIBILITY

A Device For Electromechanical Braille Reading Digital Texts	611
<i>Cicília Leite, Davi Magalhaes, Pedro Neto, Suellem Queiroz, Yaskara Fernandes</i>	
Australia's National Transition Strategy: First Stage Implementation Report	615
<i>Justin Brown, Scott Hollier, Vivienne Conway</i>	
Web Accessibility for Older Users: A Southern Argentinean View	620
<i>Viviana Ester Saldano, Adriana Elba Martin, Gabriela Gaetan, Diego Sebastian Vilde</i>	
Author Index	