

# **2010 IEEE 34th Annual Computer Software and Applications Conference Workshops**

**(COMPSACW 2010)**

**Seoul, South Korea  
19 – 23 July 2010**



**IEEE Catalog Number: CFP1067K-PRT  
ISBN: 978-1-4244-8089-0**

# 2010 34th Annual IEEE Computer Software and Applications Conference Workshops

## COMPSACW 2010

### Table of Contents

|  |              |
|--|--------------|
| Message from the Workshops Chair.....  | xiii         |
| <b>ESAS 2010 - The Fifth IEEE International Workshop<br/>on Engineering Semantic Agent Systems.....</b>                          | <b>xiv</b>   |
| <b>QUORS 2010 - Fourth IEEE International Workshop<br/>on Quality Oriented Reuse of Software.....</b>                            | <b>xviii</b> |
| <b>BINDIS 2010 - The Third International Workshop<br/>on Barriers towards Internet-Driven Information<br/>Services.....</b>      | <b>XX</b>    |
| <b>STPSA 2010 - The Fifth IEEE International Workshop<br/>on Security, Trust, and Privacy for Software<br/>Applications.....</b> | <b>xxiii</b> |
| <b>IWSC 2010 - Seventh IEEE International Workshop<br/>on Software Cybernetics.....</b>  | <b>xxiv</b>  |
| <b>SAPSE 2010 - The Second IEEE International<br/>Workshop on Security Aspects of Process<br/>and Services Engineering.....</b>  | <b>xxvi</b>  |
| <b>REFS 2010 - Fourth IEEE International Workshop<br/>on Requirements Engineering for Services.....</b>                          | <b>xxvii</b> |
| <b>CFSE 2010 - The Second IEEE International Workshop<br/>on Computer Forensics in Software Engineering.....</b>                 | <b>xxx</b>   |
| <b>ME 2010 - The Second IEEE International Workshop<br/>on Middleware Engineering.....</b>                                       | <b>xxxi</b>  |
| <b>STA 2010 - The Second IEEE International Workshop<br/>on Software Test Automation.....</b>                                    | <b>xxxii</b> |

## ESAS 2010: The Fifth IEEE Workshop on Engineering Semantic Agent Systems Session 1

|   |   |
|---|---|
| Semantic Image Retrieval Model for Sharing Experiences in Social Networks ..... | 1 |
| <i>Asli Apaydin, Duygu Çelik, and Atilla Elçi</i>                               |   |
| Ontology-Based QoS Queuing Model for Selection of Web Services Servers .....    | 7 |
| <i>Duygu Çelik and Atilla Elçi</i>  |   |

## ESAS 2010: The Fifth IEEE Workshop on Engineering Semantic Agent Systems Session 2

|  |    |
|--|----|
| Modeling Cyber-Physical Systems with Semantic Agents ..... | 13 |
| <i>Jing Lin, Sahra Sedigh, and Ann Miller</i>              |    |

## QUORS 2010: The Fourth IEEE International Workshop on Quality Oriented Reuse of Software Session 1: Service-Based Reuse

|   |    |
|---|----|
| Towards Reusing ESB Services in Different ESB Architectures ..... | 25 |
| <i>Indika Kumara and Chandana Gamage</i>                          |    |
| Negotiating Service Requirements among Strategic Actors .....     | 31 |
| <i>Tuoye Xu, Tong Li, Lin Liu, and Barrett R. Bryant</i>          |    |
| Aspect-Oriented Development of PHP-Based Web Applications .....   | 37 |
| <i>Shin Nakajima, Keiji Hokamura, and Naoyasu Ubayashi</i>        |    |

## QUORS 2010: The Fourth IEEE International Workshop on Quality Oriented Reuse of Software Session 2: Quality, Reuse, and Evolution

|   |    |
|---|----|
| Test Sequence Generation from Combining Property Modeling and Program Slicing ..... | 45 |
| <i>Hua Li, Yong-guang Peng, Xin-ming Ye, and Jing-yuan Yue</i>                      |    |
| Software Fault Prediction Models for Web Applications .....                         | 51 |
| <i>Le Truong Giang, Dongwon Kang, and Doo-Hwan Bae</i>                              |    |
| The Level of Decomposition Impact on Component Fault Tolerance .....                | 57 |
| <i>Atef Mohamed and Mohammad Zulkernine</i>   |    |

## **QUORS 2010: The Fourth IEEE International Workshop on Quality Oriented Reuse of Software Session 3: Model-Driven Techniques**

|  |    |
|--|----|
| Applied MDA for Embedded Devices: Software Design and Code Generation<br>for a Low-Cost Mobile Phone ..... | 63 |
| <i>Michael Lettner and Michael Tschernuth</i>  |    |
| The Right Tool for the Right Job: Assessing Model Transformation Quality .....                             | 69 |
| <i>M. F. van Amstel</i>  |    |
| A Model Expansion Method in Schema-Based Model Evolution .....   | 75 |
| <i>Tsung Lee and Jhih-Syan Hou</i>   |    |

## **QUORS 2010: The Fourth IEEE International Workshop on Quality Oriented Reuse of Software Session 3: Optimal Components and Practice**

|  |    |
|--|----|
| COTS Integrations: Effort Estimation Best Practices .....                        | 81 |
| <i>Anoop Kumar P., Sathia Narayanan, and Vijayalakshmi Mallenahalli Siddaiah</i> |    |
| Optimizing Software Quality Assurance .....                                      | 87 |
| <i>Omar Alshathry and Helge Janicke</i>  |    |

## **BINDIS 2010: The Third IEEE International Workshop on Barriers towards Internet-Driven Information Services Session 1: Service Creation**

|   |    |
|---|----|
| The Framework of Medical Simulation Education and Evaluation System<br>for Supporting SaaS .....              | 93 |
| <i>Jia Shang, Ji-Jiang Yang, Qing Wang, and Hui Pan</i>   |    |
| A Study of Improving the Accuracy of Software Effort Estimation Using<br>Linearly Weighted Combinations ..... | 98 |
| <i>Chao-Jung Hsu, Nancy Urbina Rodas, Chin-Yu Huang, and Kuan-Li Peng</i>                                     |    |

## **BINDIS 2010: The Third IEEE International Workshop on Barriers towards Internet-Driven Information Services Session 2: Service Management**

|  |     |
|--|-----|
| ULMS: An Accelerator for the Applications by Shifting Writing Log from Local<br>Disk to Clouds ..... | 104 |
| <i>Li Zhou, Yong Zhang, and Chunxiao Xing</i>  |     |
| WS-Sim: A Web Service Simulation Toolset with Realistic Data Support .....                           | 109 |
| <i>Wei She, I-Ling Yen, and Bhavani Thuraisingham</i>  |     |

## **STPSA 2010: The Fifth IEEE International Workshop on Security, Trust, and Privacy for Software Applications Session 1: Protocol**

|  |     |
|--|-----|
| Analysis of Two Watermarking Protocols Based on Commutative Encryption .....                         | 115 |
| <i>Moesfa S. Mohamad and Geong Sen Poh</i>   |     |
| Access Control Contracts for Java Program Modules .....  | 121 |
| <i>Carlos E. Rubio-Medrano and Yoonsik Cheon</i>   |     |
| Service Security Analysis Based on i*: An Approach from the Attacker<br>Viewpoint .....              | 127 |
| <i>Tong Li, Lin Liu, Golnaz Elahi, Eric Yu, and Barrett R. Bryant</i>                                |     |
| T-Kernel/SS: A Secure Filesystem with Access Control Protection Using<br>Tamper-Resistant Chip ..... | 134 |
| <i>Takeshi Yashiro, Masahiro Bessho, Shinsuke Kobayashi, Noboru Koshizuka,<br/>and Ken Sakamura</i>  |     |

## **STPSA 2010: The Fifth IEEE International Workshop on Security, Trust, and Privacy for Software Applications Session 2: Privacy and Access Control**

|  |     |
|--|-----|
| Privacy Preserving Distributed Learning Clustering of HealthCare Data Using<br>Cryptography Protocols .....                          | 140 |
| <i>Ahmed M. Elmisery and Huaiguo Fu</i>  |     |
| Flexible Prime Number Labeling for Resource Limited Clients .....  | 146 |
| <i>Dongchan An and Seog Park</i>   |     |
| Privacy Preserving Outlier Detection Using Hierarchical Clustering Methods .....   | 152 |
| <i>Ajay Challagalla, S. S. Shivaji Dhiraj, D. V. L. N. Somayajulu,<br/>Toms Shaji Mathew, Saurav Tiwari, and Syed Sharique Ahmad</i> |     |

## **STPSA 2010: The Fifth IEEE International Workshop on Security, Trust, and Privacy for Software Applications Session 3: Systems and Models**

|  |     |
|--|-----|
| Enforcing Information Flow Security Properties in Cyber-Physical Systems: A<br>Generalized Framework Based on Compensation ..... | 158 |
| <i>Thoshitha T. Gamage, Bruce M. McMillin, and Thomas P. Roth</i>  |     |
| Natural Language Watermarking Based on Syntactic Displacement<br>and Morphological Division .....                                | 164 |
| <i>Mi-Young Kim, Osmar R. Zaiane, and Randy Goebel</i>   |     |
| Semantic Analysis of UML2.0 Sequence Diagram Based on Model<br>Transformation .....  | 170 |
| <i>Meixia Zhu, Hanpin Wang, Wei Jin, Zizhen Wang, and Chunxiang Xu</i>   |     |
| Environmental Obfuscation of a Cyber Physical System - Vehicle Example .....   | 176 |
| <i>Jason Madden, Bruce McMillin, and Anik Sinha</i>  |     |

## **IWSC 2010: The Seventh International Workshop on Software Cybernetics Session 2**

|   |     |
|---|-----|
| Optimizing Requirements Elicitation with an i* and Bayesian Network Integrated Modelling Approach ..... | 182 |
| <i>Haochi Wu, Lin Liu, and Wenting Ma</i>   |     |
| Delegation Pattern in Workflow System .....   | 189 |
| <i>Hwai-Jung Hsu and Feng-Jian Wang</i>   |     |
| Entropy-Based Measures of Heterogeneity of Software Structural Profile .....                            | 196 |
| <i>Bei-Bei Yin, Ling-Zan Zhu, and Kai-Yuan Cai</i>  |     |

## **IWSC 2010: The Seventh International Workshop on Software Cybernetics Session 3**

|  |     |
|--|-----|
| Feedback Control Based Test Case Instantiation for Firewall Testing .....                | 202 |
| <i>Tugkan Tuglular and Gurcan Gercek</i>   |     |
| Using Coverage Information to Guide Test Case Selection in Adaptive Random Testing ..... | 208 |
| <i>Zhi Quan Zhou</i>   |     |
| A Parallel Implementation Strategy of Adaptive Testing .....                             | 214 |
| <i>Hai Hu, Chang-Hai Jiang, Feng Ye, Kai-Yuan Cai, Dazhi Huang, and Stephen S. Yau</i>   |     |

## **IWSC 2010: The Seventh International Workshop on Software Cybernetics Session 4**

|  |     |
|--|-----|
| Natural Language Processing Based Detection of Duplicate Defect Patterns ..... | 220 |
| <i>Qian Wu and Qianxiang Wang</i>  |     |

## **SAPSE 2010: The Second International Workshop on Security Aspects of Process and Services Engineering**

|   |     |
|---|-----|
| Modeling and Verification of an Automatic Train Protection System ..... | 226 |
| <i>Xijiao Xiong, Jing Liu, Miaomiao Zhang, and Zuohua Ding</i>          |     |
| Toward Cloud-Based Key Management for Outsourced Databases .....        | 232 |
| <i>Nadia Bennani, Ernesto Damiani, and Stelvio Cimato</i>               |     |

## **REFS 2010: The Fourth IEEE International Workshop on Requirements Engineering for Services Session 2: Services Requirements Identification, Analysis and Management**

|   |     |
|---|-----|
| A Scenario Based Approach for Service Identification .....  | 237 |
| <i>Suntae Kim, Minseong Kim, Vijayan Sugumaran, and Sooyong Park</i>  |     |
| Analyzing Interoperability Requirements for Adaptive Service-Based Applications: A Goal-Oriented Approach ..... | 239 |
| <i>Nauman A. Qureshi, Cu D. Nguyen, and Anna Perini</i>   |     |
| Requirements and Tools for Variability Management .....   | 245 |
| <i>Marco Aiello, Pavel Bulanov, and Heerko Groefsema</i>  |     |

## **REFS 2010: The Fourth IEEE International Workshop on Requirements Engineering for Services Session 3: Position Statements on Requirements Engineering for Services**

|  |     |
|--|-----|
| A Requirements Maturity Measurement Approach Based on SKLSEWiki .....  | 251 |
| <i>Rong Peng, Qiang Ye, and Mao Ye</i>   |     |
| Stakeholders-Driven Requirements Semantics Acquisition for Networked Software Systems .....  | 255 |
| <i>Bin Wen, Peng Liang, and Keqing He</i>  |     |
| Loosely-Coupled SOA Service Access Provisioning .....  | 259 |
| <i>Sean Gu</i>   |     |
| Elicitation of Goals in Requirements Engineering Using Agile Methods .....   | 263 |
| <i>A. M. Sen and K. Hemachandran</i>   |     |
| A Framework for the Elicitation and Analysis of Information Technology Service Requirements and Their Alignment with Enterprise Business Goals ..... | 269 |
| <i>Didar Zowghi and Zhi Jin</i>  |     |

## **CFSE 2010: The Second IEEE International Workshop on Computer Forensics in Software Engineering**

|   |     |
|---|-----|
| Dynamic Analysis for the Reconstruction of System Behavior Models .....                                     | 273 |
| <i>Vasileios Koutsoumpas, Kostas Kontogiannis, and Peter Matthews</i>                                       |     |
| Author Identification of Software Source Code with Program Dependence Graphs .....                          | 281 |
| <i>Rong Chen, Lina Hong, Chunyan Lü, and Wu Deng</i>  |     |
| XIDR: A Dynamic Framework Utilizing Cross-Layer Intrusion Detection for Effective Response Deployment ..... | 287 |
| <i>Igors Sveics, Tanmoy Sarkar, Samik Basu, and Johnny S. Wong</i>  |     |

## **ME 2010: The Second IEEE International Workshop on Middleware Engineering Session 1: Middleware Architectures**

|  |     |
|--|-----|
| Middleware Support for Mobile Social Ecosystems .....  | 293 |
| <i>Alessandra Toninelli, Animesh Pathak, Amir Seyedi, Roberto Speicys Cardoso, and Valérie Issarny</i> |     |
| A Middleware for Personal Smart Spaces .....   | 299 |
| <i>Manal Al-Bahlal and Jalal Al-Muhtadi</i>  |     |
| Message Oriented Middleware Support for Mobile Ad Hoc Data Sharing .....                               | 305 |
| <i>Hongjun Yu, Rong Chen, and Zhenjun Du</i>   |     |

## **ME 2010: The Second IEEE International Workshop on Middleware Engineering Session 2: Middleware Applications**

|  |     |
|--|-----|
| A Context-Aware Meeting Room: Mobile Interaction and Collaboration Using Android, Java ME and Windows Mobile ..... | 311 |
| <i>Tor-Morten Grønli, Jarle Hansen, and Gheorghita Ghinea</i>  |     |
| MiRE4OWL: Mobile Rule Engine for OWL .....   | 317 |
| <i>Taehun Kim, Insuk Park, Soon J. Hyun, and Dongman Lee</i>   |     |

## **STA 2010: The Second IEEE International Workshop on Software Test Automation Session 1**

|   |     |
|---|-----|
| Supporting Concern-Based Regression Testing and Prioritization in a Model-Driven Environment .....            | 323 |
| <i>Roberto S. Silva Filho, Christof J. Budnik, William M. Hasling, Monica McKenna, and Rajesh Subramanyan</i> |     |

## **STA 2010: The Second IEEE International Workshop on Software Test Automation Session 2: Integration & Performance Testing**

|  |     |
|--|-----|
| Using Coupling Measure Technique and Random Iterative Algorithm for Inter-Class Integration Test Order Problem ..... | 329 |
| <i>Zhengshan Wang, Bixin Li, Lulu Wang, Meng Wang, and Xufang Gong</i>   |     |
| Normalized Adaptive Random Test for Integration Tests .....  | 335 |
| <i>Seung-Hun Shin, Seung-Kyu Park, Kyung-Hee Choi, and Ki-Hyun Jung</i>  |     |
| Performance Testing: Far from Steady State .....   | 341 |
| <i>Rajesh Mansharamani, Amol Khanapurkar, Benny Mathew, and Rajesh Subramanyan</i>                                   |     |



## **STA 2010: The Second IEEE International Workshop on Software Test Automation Session 3: Test Prioritization, Regression Testing, and Formal Aspects**

|   |     |
|---|-----|
| An Approach to Regression Test Selection Based on Hierarchical Slicing<br>Technique ..... | 347 |
| <i>Chuanqi Tao, Bixin Li, Xiaobing Sun, and Chongfeng Zhang</i>                           |     |
| Approximation of CFL by Regular Languages for Concurrent Program<br>Verification .....    | 353 |
| <i>Sukhamay Kundu and Supratik Mukhopadhyay</i>   |     |
| An Optimization Strategy for Evolutionary Testing Based on Cataclysm .....                | 359 |
| <i>Meng Wang, Bixin Li, Zhengshan Wang, and Xiaoyuan Xie</i>                              |     |

## **CloudApp 2010: The First IEEE International Workshop on Emerging Applications for Cloud Computing Session 1**

|   |     |
|---|-----|
| LAYSI: A Layered Approach for SLA-Violation Propagation<br>in Self-Manageable Cloud Infrastructures .....                           | 365 |
| <i>Ivona Brandic, Vincent C. Emeakaroha, Michael Maurer, Schahram Dustdar,<br/>Sandor Acs, Attila Kertesz, and Gabor Kecskemeti</i> |     |
| Permission Management System: Permission as a Service in Cloud<br>Computing .....   | 371 |
| <i>Victor Echeverría, Lorie M. Liebrock, and Dongwan Shin</i>   |     |
| An Anomaly Detection Framework for Autonomic Management of Compute<br>Cloud Systems .....   | 376 |
| <i>Derek Smith, Qiang Guan, and Song Fu</i>   |     |

## **CloudApp 2010: The First IEEE International Workshop on Emerging Applications for Cloud Computing Session 2**

|   |            |
|---|------------|
| The Case for Content Search of VM Clouds .....  | 382        |
| <i>Mahadev Satyanarayanan, Wolfgang Richter, Glenn Ammons, Jan Harkes,<br/>and Adam Goode</i>     |            |
| FalconEye: Data Center Status Extraction via Vision Transformation<br>Techniques .....            | 388        |
| <i>Ki-Woong Park, Woomin Hwang, and Kyu Ho Park</i>   |            |
| SecureCloud: Towards a Comprehensive Security Framework for Cloud<br>Computing Environments ..... | 393        |
| <i>Hassan Takabi, James B. D. Joshi, and Gail-Joon Ahn</i>  |            |
| <b>Author Index</b> .....   | <b>399</b> |