RECENT ADVANCEs in SOFTWARE ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS

Proceedings of the 9th WSEAS International Conference on SOFTWARE ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS (SEPADS '10)

University of Cambridge, UK
February 20-22, 2010
RECENT ADVANCES in SOFTWARE ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS

Proceedings of the 9th WSEAS International Conference on SOFTWARE ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS (SEPADS '10)

University of Cambridge, UK
February 20-22, 2010
Editors:
Prof. Lotfi A. Zadeh, University of Berkeley, USA
Prof. Janusz Kacprzyk, International Fuzzy Systems Association, POLAND
Prof. Nikos Mastorakis, Technical University of Sofia, BULGARIA
Prof. Angel Kuri-Morales, Instituto Tecnologico Autonomo de Mexico, MEXICO
Prof. Pierre Borne, Ecole Centrale de Lille, FRANCE
Prof. Leonid Kazovsky, Stanford University, USA

International Program Committee Members:
Cuauhtemoc Rodriguez, UK
Gehan A.J. Amaratunga, UK
Pierre Borne, FRANCE
Bogdan Gabrys, UK
Demterios Kazakos, USA
F.-K. Benra, GERMANY
Dana Simian, ROMANIA
Calin Ciufudean, ROMANIA
Yang Li-Shang, TAIWAN
Urszula Ledzewicz, USA
Ioannis Pountourakis, GREECE
M. Isabel Garcia-Planas, SPAIN
Fathi M. Allan, UAE
Andris Buikis, LATVIA
Akshai Aggarwal, CANADA
Blyden, USA
Octavian Cret, ROMANIA
Valeri Mladenov, BULGARIA
Zoran S. Bojkovic, SERBIA
Nikos C. Tsourveloudis, GREECE
Angel Fernando Kuri Morales, MEXICO
Fumiaki Imado, JAPAN
Ioannis Gonos, GREECE
Irina Zheliazkova, BULGARIA
A. Andreatos, GREECE
G. R.Dattatreya, USA
Preface
This year the 9th WSEAS International Conference on SOFTWARE ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS (SEPADS ’10) was held at the University of Cambridge, UK, February 20-22, 2010. The conference remains faithful to its original idea of providing a platform to discuss software engineering, PDS'architectures, PDS'software, PDS'algorithms and applications, other issues on PDS' and software engineering, algorithms etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors
# Table of Contents

**A Model of Aviation Technology Education with Transnational Internet**  
Rong-Jyue Fang, Hua-Lin Tsai, Chi-Jen Lee, Yung-Sheng Chang  

13

**A Model of Instruction with Interactive Whiteboard Learning**  
Rong-Jyue Fang, Hua-Lin Tsai, Chi-Jen Lee, Yung-Sheng Chang  

20

**The Model of Multimedia and Cognitive Learning Theory**  
Rong-Jyue Fang, Yung-Sheng Chang, Chi-Jen Lee, Hua-Lin Tsai  

25

**A Model of the Personal Digital Assistant Promoting the Teacher's Instructional Innovation**  
Rong-Jyue Fang, Yung-Sheng Chang, Chi-Jen Lee, Hua-Lin Tsai  

31

**A Model of The D-Learning Way on Science and Technological Course**  
Rong-Jyue Fang, Hua-Lin Tsai, Chi-Jen Lee, Yung-Chen Chang  

39

**Glaze Calculation Software Based on the Seger Method with Recipe Mixing Utilities, Limit Formulas and Toxicity Measurements**  
Christos Romanosoglou, Theofanis Alexandridis, Maria Tsapoga, Efstathia Papaioannoy, Nikolaos V. Karadimas  

45

**Parallel Multiple Alignment of the Influenza Virus A/H1N1 Genome Sequences on a Heterogeneous Compact Computer Cluster**  
Plamenka Borovska, Ognian Nakov, Veska Gancheva, Ivailo Georgiev  

50

**A Real Time Application based Java-Based Distributed Object Processing System for IP Telephony**  
G. Vijay Kumar, G. V. Raju  

56

**Tertiary Buddy System for Efficient Dynamic Memory Allocation**  
Divakar Yadav, A. K. Sharma  

61

**Software Development and Testing: A System Dynamics Simulation and Modeling Approach**  
Kumar Saurabh  

67

**Validating Object-Oriented Class Cohesion Metrics Mathematically**  
Jehad Al Dallal  

73

**The Recursive Network-Based Routing Algorithm**  
Dongmin Choi, Ilyong Chung  

78

**An Energy-Efficient Clustering for Normal Distributed Sensor Networks**  
Xin Su, Dongmin Choi, Sangman Moh, Ilyong Chung  

81

**Device-Aware Cache Management based on Adaptive Replacement**  
Young-Jin Kim, Aldhino Anggorosesar  

85

**A Triple Graph Grammar (TGG) Approach for Mapping UML 2 Activities into Petri Nets**  
Anthony Spiteri Staines  

90

**A New Framework for the development of AVL based Transport Monitoring System**  
S. Masrom, Siti Z. Z. Abidin, P. N. Hashimah, A. S. Abd. Rahman  

96
Model Driven Development for Embedded Systems
Kunihihiko Ito, Saeko Matsuura

Design and Implementation of Efficient Semi-Synchronous Replication Solution for Disaster Recovery
Rekha Singhal, Shreya Bokare, Prasad Pawar

Software Verification of a Virtual Development Environment for Embedded Software
Febiansyah Hidayat, Hadipurnawan Satria, Jin B. Kwon

Supporting a Project Leader within an Evolving Product Library
Edward Fischer

Implicit Domain Decomposition Scheme for Parallel Dynamic Finite Element Geotechnical Analysis
Zhao Ben, Goh Siang Huat, Lee Fook Hou

Adaptive Refactoring Using a Core-Based Clustering Approach
Gabriela Czibula, Istvan Gergely Czibula

Use of Finite State Automaton as an attempt to Simplify, Automate and Improve Requirements Engineering
Amit Sugandhi

Secure Bluetooth Services in an M-Learning Environment
Catalin Boja, Lorena Batagan, Mihai Doinea, Alin Zamfirou

Towards the Reliable Integration Testing: UML-based Scenario Analysis using an Automatic Prototype Generation Tool
Shinpei Ogata, Saeko Matsuura

An Experience on Introducing a Mobile Community Platform: Flying2U
Wong Poh Lee, Mohd Azam Osman, Maziani Sabudin, Shahida Sulaiman

Multi-Modal Game Based Learning: Satisfaction and Users Achievement Approach
Khaled Ayad, Dimitrios Rigas

Efficiency of Multimodal Metaphors in E-learning Platform
Mohamed Sallam, Dimitrios Rigas

The First Search Right Algorithm for Redundant Reader Elimination in RFID Network
Jui-Wen Hung, I-Hui Li, Hsin-Hung Lin, Jyun-An Cai

Value Elicitation in Value Based Software Engineering
Ghulam Murtaza, Abdul Basit, Naveed Ikram

Validation of VRRM Process Model
Abdul Basit, Ghulam Murtaza, Naveed Ikram

Symmetries Analysis of a Mathematical Model with a MACSYMA Program
Maria S. Bruzon, Maria L. Gandarias

Distributed System for Access Control to Physical Resources based on Qualifications
Daniela Cristea, Octavian Prostean, Thomas Muschalik, Ovidiu Tirian
ENOD sort on Diamond architecture
Masumeh Damrudi, Kamal Jadidy Aval

Travelling Wave Solutions for a Generalized Boussinesq Equation by using Free Software
Maria Luz Gandarias, Maria Santos Bruzon

Multi-Agent Negotiation based Semantic Web Service Composition Models
Sandeep Kumar, Nikos E. Mastorakis

An Empirical Investigation on Effectiveness of Game Based Learning
Dimitrios Rigas, Khaled Ayad

Multimodal E-learning on Note-Taking: A User Satisfaction Perspective
Dimitrios Rigas, Mohamed Sallam

Management Issues in Software Development
Mubashir Ahmad, Muhamamd Imran, Abdul Wahab

A Study on the Application of Existing Load Balancing Algorithms for Large, Dynamic, Heterogeneous Distributed Systems
Rupam Mukhopadhyay, Dibyajyoti Ghosh, Nandini Mukherjee

New Challenges in Accounting Applications Software for Developing Double-Input Bookkeeping
Brindusa Covaci, Luminita Ionescu, George Lazaroiu

Mining the Students' Preferences Regarding e-Learning Environments
Ramona Lacurezeanu, Vasile Paul Bresfelean, Robert Buchmann

Authors Index
### Authors Index

<table>
<thead>
<tr>
<th>Authors</th>
<th>Pages</th>
<th>Authors</th>
<th>Pages</th>
<th>Authors</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abidin, S. Z. Z.</td>
<td>96</td>
<td>Fang, R.-J.</td>
<td>31, 39</td>
<td>Murtaza, G.</td>
<td>184, 190</td>
</tr>
<tr>
<td>Ahmad, M.</td>
<td>232</td>
<td>Fischer, E.</td>
<td>119</td>
<td>Muschakil, T.</td>
<td>201</td>
</tr>
<tr>
<td>Al Dallal, J.</td>
<td>73</td>
<td>Gancheva, V.</td>
<td>50</td>
<td>Nakov, O.</td>
<td>50</td>
</tr>
<tr>
<td>Alexandris, T.</td>
<td>45</td>
<td>Gandarias, M. L.</td>
<td>196, 209</td>
<td>Ogata, S.</td>
<td>151</td>
</tr>
<tr>
<td>Anggorosesar, A.</td>
<td>85</td>
<td>Georgiev, I.</td>
<td>50</td>
<td>Osman, M. A.</td>
<td>160</td>
</tr>
<tr>
<td>Aval, K. J.</td>
<td>205</td>
<td>Ghosh, D.</td>
<td>238</td>
<td>Papaioannoy, E.</td>
<td>45</td>
</tr>
<tr>
<td>Ayad, K.</td>
<td>166, 224</td>
<td>Hashimah, P. N.</td>
<td>96</td>
<td>Pawar, P.</td>
<td>109</td>
</tr>
<tr>
<td>Basit, A.</td>
<td>184, 190</td>
<td>Hidayat, F.</td>
<td>115</td>
<td>Prostean, O.</td>
<td>201</td>
</tr>
<tr>
<td>Batagan, L.</td>
<td>144</td>
<td>Hou, L. F.</td>
<td>127</td>
<td>Raju, G. V.</td>
<td>56</td>
</tr>
<tr>
<td>Ben, Z.</td>
<td>127</td>
<td>Huat, G. S.</td>
<td>127</td>
<td>Rigas, D.</td>
<td>166, 172</td>
</tr>
<tr>
<td>Boja, C.</td>
<td>144</td>
<td>Hung, J.-W.</td>
<td>177</td>
<td>Rigas, D.</td>
<td>224, 228</td>
</tr>
<tr>
<td>Bokar, S.</td>
<td>109</td>
<td>Ikram, N.</td>
<td>184, 190</td>
<td>Romanosoglou, C.</td>
<td>45</td>
</tr>
<tr>
<td>Borovska, P.</td>
<td>50</td>
<td>Imran, M.</td>
<td>232</td>
<td>Sabudin, M.</td>
<td>160</td>
</tr>
<tr>
<td>Bresfelean, V. P.</td>
<td>250</td>
<td>Ionescu, L.</td>
<td>244</td>
<td>Sallam, M.</td>
<td>172, 228</td>
</tr>
<tr>
<td>Bruzon, M. S.</td>
<td>196, 209</td>
<td>Ito, K.</td>
<td>102</td>
<td>Satria, H.</td>
<td>115</td>
</tr>
<tr>
<td>Buchmann, R.</td>
<td>250</td>
<td>Karadimas, N. V.</td>
<td>45</td>
<td>Saurabh, K.</td>
<td>67</td>
</tr>
<tr>
<td>Cai, J.-A.</td>
<td>177</td>
<td>Kim, Y.-J.</td>
<td>85</td>
<td>Sharma, A. K.</td>
<td>61</td>
</tr>
<tr>
<td>Chang, Y.-C.</td>
<td>39</td>
<td>Kumar, G. V.</td>
<td>56</td>
<td>Singhal, R.</td>
<td>109</td>
</tr>
<tr>
<td>Chang, Y.-S.</td>
<td>13, 20</td>
<td>Kumar, S.</td>
<td>214</td>
<td>Staines, A. S.</td>
<td>90</td>
</tr>
<tr>
<td>Chang, Y.-S.</td>
<td>25, 31</td>
<td>Kwon, J. B.</td>
<td>115</td>
<td>Su, X.</td>
<td>81</td>
</tr>
<tr>
<td>Chi-Jen Lee, C.-J.</td>
<td>13, 20, 25</td>
<td>Lacurezeanu, R.</td>
<td>250</td>
<td>Sugandhi, A.</td>
<td>139</td>
</tr>
<tr>
<td>Chi-Jen Lee, C.-J.</td>
<td>31, 39</td>
<td>Lazarou, G.</td>
<td>244</td>
<td>Sulaiman, S.</td>
<td>160</td>
</tr>
<tr>
<td>Choi, D.</td>
<td>78, 81</td>
<td>Lee, W. P.</td>
<td>160</td>
<td>Tirian, O.</td>
<td>201</td>
</tr>
<tr>
<td>Chung, I.</td>
<td>78, 81</td>
<td>Li, I.-H.</td>
<td>177</td>
<td>Tsai, H.-L.</td>
<td>13, 20, 25</td>
</tr>
<tr>
<td>Covaci, B.</td>
<td>244</td>
<td>Lin, H.-H.</td>
<td>177</td>
<td>Tsai, H.-L.</td>
<td>31, 39</td>
</tr>
<tr>
<td>Cristea, D.</td>
<td>201</td>
<td>Masrom, S.</td>
<td>96</td>
<td>Tsapoga, M.</td>
<td>45</td>
</tr>
<tr>
<td>Czibula, G.</td>
<td>133</td>
<td>Mastorakis, N. E.</td>
<td>214</td>
<td>Wahab, A.</td>
<td>232</td>
</tr>
<tr>
<td>Czibula, I. G.</td>
<td>133</td>
<td>Matsuura, S.</td>
<td>102, 151</td>
<td>Yadav, D.</td>
<td>61</td>
</tr>
<tr>
<td>Damrudi, M.</td>
<td>205</td>
<td>Moh, S.</td>
<td>81</td>
<td>Zamfiroiu, A.</td>
<td>144</td>
</tr>
<tr>
<td>Doinea, M.</td>
<td>144</td>
<td>Mukherjee, N.</td>
<td>238</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>