

# **2009 14th IEEE International Conference on Engineering of Complex Computer Systems**

**(ICECCS)**

**Potsdam, Germany  
2 – 4 June 2009**



**IEEE Catalog Number: CFP09077-PRT  
ISBN: 978-1-4244-4483-0**

**Copyright © 2009 by the Institute of Electrical and Electronic Engineers, Inc  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\*This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number: CFP09077-PRT  
ISBN 13: 978-1-4244-4483-0

**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  
E-mail: curran@proceedings.com

**2009 14th IEEE International  
Conference on Engineering of Complex  
Computer Systems**

**ICECCS 2009**

**Table of Contents**

**Message from General Chairs**

**Program Committee**

**Keynote: Continuous Model Driven Engineering**

**Keynote: On the Increasing Complexity of Multimedia**

**Service Provision in Next Generation Networks and  
the Future Internet**

---

**Verification, Testing and Integration**

A Proof Based Approach for Modelling and Verifying Web Services Compositions .....	1
<i>Idir Ait-Sadoune and Yamine Ait-Ameur</i>	
ASIIST: Application Specific I/O Integration Support Tool for Real-Time Bus Architecture Designs .....	11
<i>Min-Young Nam, Rodolfo Pellizzoni, Lui Sha, and Richard M. Bradford</i>	
Testing an Open Source Suite for Open Queuing Network Modelling Using Metamorphic Testing Technique .....	23
<i>TY. Chen, F.-C. Kuo, R. Merkel, and W.K.Tam</i>	

**Software Architecture**

Architecture Design for the Large-Scale Software-Intensive Systems: A Decision-Oriented Approach and the Experience .....	30
<i>Xiaofeng Cui, Yanchun Sun, Sai Xiao, and Hong Mei</i>	
Towards OpenWorld Software Architectures with Semantic Architectural Styles, Components and Connectors .....	40
<i>Weishan Zhang, Klaus Marius Hansen, and João Fernandes</i>	
Architecture Driven Modernization in Practice – Study Results .....	50
<i>Andrey Sadovykh, Lionel Vigier, Andreas Hoffmann, Juergen Grossmann, Tom Ritter, Eduardo Gomez, and Oleg Estekhin</i>	
Energy Efficient Duty Allocation Protocols for Wireless Sensor Networks .....	58
<i>Jonathan Tate and Iain Bate</i>	

## Modelling

Formal Modelling and Analysis of Business Information Applications with Fault Tolerant Middleware .....	68
<i>Jeremy Bryans, John Fitzgerald, Alexander Romanovsky, and Andreas Roth</i>	
Ontology Aided Model Comparison .....	78
<i>Kleinner Oliveira, Karin Breitman, and Toacy Oliveira</i>	
REMES: A Resource Model for Embedded Systems .....	84
<i>Cristina Seceleanu, Aneta Vulgarakis, and Paul Pettersson</i>	

## Formal Models and Code

From Bio-jETI Process Models to Native Code .....	95
<i>Anna-Lena Lamprecht, Tiziana Margaria, and Bernhard Steffen</i>	
Formal Specification and Code Generation of Programmable Logic Controllers .....	102
<i>Rui Wang, Ming Gu, Xiaoyu Song, and Hai Wan</i>	
Analysis and Code Model Extraction for C/C++ Source Code .....	110
<i>Christian Wagner, Tiziana Margaria, and Hans-Georg Pagendarm</i>	

## Security, Trust and Dependability

Security Aspect of the Complexity of Modern Surveillance Systems – An Experience Report .....	120
<i>Aleksandra Karimaa</i>	
A Rigorous Approach to Uncovering Security Policy Violations in UML Designs .....	126
<i>Lijun Yu, Robert France, Indrakshi Ray, and Sudipto Ghosh</i>	
Computational Trust to Insure the Quality of Assistance Given to Human Actors .....	136
<i>Christine Gertosio</i>	
Benchmarking Dependability of a System Biology Application .....	146
<i>Yuhui Chen, Alexander Romanovsky, Anatoliy Gorbenko, Vyacheslav Kharchenko, Seyran Mamutov, and Olga Tarasyuk</i>	
CONNECT Challenges: Towards Emergent Connectors for Eternal Networked Systems .....	154
<i>Valérie Issarny, Bernhard Steffen, Bengt Jonsson, Gordon Blair, Paul Grace, Marta Kwiatkowska, Radu Calinescu, Paola Inverardi, Massimo Tivoli, Antonia Bertolino, and Antonino Sabetta</i>	

## Special Track: From Theory to Practice

The Design of a Conceptual Framework and Technical Infrastructure for Model Management Language Engineering .....	162
<i>Richard F. Paige, Dimitrios S. Kolovos, Louis M. Rose, Nicholas Drivalos, and Fiona A.C. Polack</i>	
Test your Strategy: Graphical Construction of Strategies for Connect-Four .....	172
<i>Marco Bakera, Sven Jörges, and Tiziana Margaria</i>	
Abstractions of Web Services .....	182
<i>Ali N. Haidar and Ali E. Abdallah</i>	

An Evaluation of the NSGA-II and MOCeII Genetic Algorithms for Self-Management	192
Planning in a Pervasive Service Middleware .....	192
<i>Weishan Zhang and Klaus Marius Hansen</i>	
SBAC: Service Based Access Control .....	202
<i>Udaya Kiran Tupakula, Vijay Varadharajan, and Sunil Kumar Vuppala</i>	
On the Applicability of Compressive Sampling in Fine Grained Processor	
Performance Monitoring .....	210
<i>Tomas Tuma, Sean Rooney, and Paul Hurley</i>	

## **Special Track: Integrating Software Engineering and Human-Computer Interaction**

Using Cases in Variability Analysis to Promote the Design of Flexible, Adaptable and Adaptive Systems .....	220
<i>Bruno Santana da Silva, Simone Diniz Junqueira Barbosa, and Julio Cesar Leite</i>	
ATRIUM: Software Architecture Driven by Requirements .....	230
<i>Francisco Montero and Elena Navarro</i>	
Enabling eXtreme Model Driven Design of Parlay X-based Communications Services for End-to-End Multiplatform Service Orchestrations .....	241
<i>Niklas Blum, Thomas Magedanz, Jan Kleefßen, and Tiziana Margaria</i>	
Towards an Embedded Software Component Quality Verification Framework .....	249
<i>Fernando Carvalho and Silvio Meira</i>	

## **Wearables, Augmented and Virtual Reality**

An Automated Platform for Immersive and Collaborative Visualization of Industrial Models .....	259
<i>Nelson Duarte Filho, Silvia Costa Botelho, Jonata Tyska Carvalho, Pedro de Botelho Marcos, Renan de Queiroz Maffei, Rodrigo Ruas Oliveira, and Vinicius Alves Hax</i>	
Information System Architecture for Wearable Cardiac Sensors Personalization .....	266
<i>Asta Krupaviciute, Jocelyne Fayn, Paul Rubel, Christine Verdier, Eric McAdams, and Chris Nugent</i>	

## **Development Process and Requirements**

Some Observations on a Maturity Model for CBSE .....	274
<i>A. K. Tripathi and Ratneshwer</i>	
Applying the COSMIC Functional Size Measurement Method to Problem Frames .....	283
<i>Vieri del Bianco and Luigi Lavazza</i>	
An Integrated Specification Logic for Cyber-Physical Systems .....	292
<i>Marius C. Bujorianu and Howard Barringer</i>	
A Reflective Approach for Supporting the Dynamic Evolution of Component Types .....	302
<i>Cristóbal Costa-Soria, David Hervás-Muñoz, Jennifer Pérez, and José Ángel Carsí</i>	

## Special Track: UML & AADL

UML Modeling and Formal Verification of Control/Data Driven Embedded Systems .....	312
<i>Fateh Boutekkouk and Mohamed Benmohammed</i>	
Constraint Management in Engineering of Complex Information Systems .....	318
<i>Marie-Noelle Terrasse, Marinette Savonnet, Eric Leclercq, Pierre Naubourg, Valery Lopes, Arnaud Da Costa, and Thierry Grison</i>	
AADL Simulation and Performance Analysis in SystemC .....	324
<i>Roberto Varona-Gómez and Eugenio Villar</i>	
Common Pitfalls of Using QVT Relations - Graphical Debugging as Remedy .....	330
<i>Angelika Kusel, Wieland Schwinger, Manuel Wimmer, and Werner Retschitzegger</i>	
Visual Comparison of Graphical Models .....	336
<i>Arne Schipper, Hauke Fuhrmann, and Reinhard von Hanxleden</i>	
Integrating AADL within a Multi-domain Modeling Framework .....	342
<i>Ivano Malavolta, Henry Muccini, and Patrizio Pelliccione</i>	
A Comparative Study of FIACRE and TASM to Define AADL Real Time Concepts .....	348
<i>Lei Pi, Zhibin Yang, J-P Bodeveix, M. Filali, Kai Hu, and Dianfu Ma</i>	
Towards a Model-Driven Approach for Mapping Requirements on AADL Architectures .....	354
<i>Christophe Ponsard and Mathieu Delehay</i>	
An Emerging Need for a New Software Engineering Method .....	360
<i>Isabelle Perseil and Laurent Pautet</i>	
Verification of Replication Architectures in AADL .....	366
<i>Dionisio de Niz and Peter H. Feiler</i>	
Executing AADL Models with UML/MARTE .....	372
<i>Frédéric Mallet, Charles André, and Julien DeAntoni</i>	
Modeling the Implementation of State-Based System Architectures .....	378
<i>Peter H. Feiler</i>	
Automating the Generation of Platform Specific Models .....	384
<i>W. El Hajj Chehade, A. Radermacher, A. Cuccuru, S. Gérard, and F. Terrier</i>	

## Author Index