

Proceedings

Thirteenth IEEE International Conference on the Engineering of Complex Computer Systems

ICECCS 2008

31 March-4 April 2008 • Belfast, Northern Ireland

Sponsored by

IEEE Computer Society Technical Committee on Complexity in Computing (TC-CCX)

In cooperation with

The University of Ulster Computer Science Research Institute (CSRI)
The University of Ulster Centre for Software Process Technologies (CSPT)
Lero: The Irish Software Institute



Los Alamitos, California
Washington • Tokyo



Table of Contents

13th IEEE International Conference on Engineering of Complex Computer Systems

ICECCS 2008

Foreword	viii
Conference Organization.....	ix
Program Committee	x
Sponsors	xi

Keynotes

Verified Software: Theories, Tools, Experiments	3
<i>Sir Tony Hoare</i>	
Global Software Engineering Research in a Small Country.....	4
<i>Kevin Ryan</i>	

Session I: Verification

Verifying Statecharts with State Invariants	7
<i>Emil Sekerinski</i>	
Verifying Semistructured Data Normalization Using PVS	15
<i>Scott Uk-Jin Lee, Jing Sun, Gillian Dobbie, and Lindsay Groves</i>	
A Scalable Approach to Multi-style Architectural Modeling and Verification.....	25
<i>Stephen Wong, Jing Sun, Ian Warren, and Jun Sun</i>	

Session II: Specification and Design

Revisiting Safe Realizability of Message Sequence Charts Specifications	37
<i>Abdolmajid Mousavi and Behrouz H. Far</i>	
iPSL: An Environment for IP-Based PSL Specification	46
<i>Naiyong Jin, Juan Zhou, and Taoyong Ni</i>	
Task Mapping in Heterogeneous MPSoCs for System Level Design	56
<i>Kugan Vivekanandarajah and Santhosh Kumar Pilakkat</i>	

Session III: Synchronization and Scheduling

High-Precision Relative Clock Synchronization Using Time Stamp Counters.....	69
<i>Guo-Song Tian, Yu-Chu Tian, and Colin Fidge</i>	
Integrated Real-Time Scheduling and Communication with Probabilistic Timing Assurances in Unreliable Distributed Systems.....	79
<i>Fei Huang, Kai Han, Binoy Ravindran, and E. D. Jensen</i>	

Session IV: Testing and Prediction

Why Predicting Outliers in Software is a Good Thing to Do!	91
<i>Norm Schneidewind and Mike Hinckey</i>	

On Extracting Tests from a Testable Model in the Context of Domain Engineering	98
<i>Soheila Bashardoust-Tajali and Jean-Pierre Corriveau</i>	

Session V: Web Services and Pervasive Computing

A Formal Model of Semantic Web Service Ontology (WSMO) Execution.....	111
<i>Hai H. Wang, Nick Gibbins, Terry Payne, Ahmed Saleh, and Jun Sun</i>	

Jini++: A Framework for Developing Pervasive and Wireless Distributed Applications	121
<i>Zhi Quan Lee, Yuan Qin Zhu, and Ian Warren</i>	

GENESIS - A Framework for Automatic Generation and Steering of Testbeds of Complex Web Services	131
<i>Lukasz Juszczak, Hong-Linh Truong, and Schahram Dustdar</i>	

Invited Session I - Grand Challenge in Verified Software

Chair: Jim Woodcock

Linking VDM and Z	143
<i>Jim Woodcock and Leo Freitas</i>	

POSIX and the Verification Grand Challenge: A Roadmap.....	153
<i>Leo Freitas, Jim Woodcock, and Andrew Butterfield</i>	

Invited Session II - Semantic Services and Mobility

Chair: Karin Breitman

Ambient Intelligence Applications: Introducing the Campus Framework	165
<i>Amal El Fallah Seghrouchni, Karin Breitman, Nicolas Sabouret, Markus Endler, Yasmine Charif, and Jean-Pierre Briot</i>	

Ubiquitous Service Regulation Based on Dynamic Rules.....	175
<i>José Viterbo F., Markus Endler, and Jean-Pierre Briot</i>	

The Semantic Web Services Challenge: Tackling Complexity at the Orchestration Level.....	183
<i>Tiziana Margaria</i>	

Invited Session III: Experimental Software Engineering

Chair: Jose Carlos Maldonado

An Environment to Support Large Scale Experimentation in Software Engineering.....	193
<i>Guilherme H. Travassos, Paulo Sérgio Medeiros dos Santos, Paula Gomes Mian, Arilo Cláudio Dias Neto, and Jorge Biolchini</i>	

A Framework for Software Engineering Experimental Replications	203
<i>Manoel G. Mendonça, José C. Maldonado, Maria C.F. de Oliveira, Jeffrey Carver, Sandra C.P.F. Fabbri, Forrest Shull, Guilherme H. Travassos, Erika Nina Höhn, and Victor R. Basili</i>	

ICECCS Workshop - UML & AADL'2008**Chairs: Agusti Canals, Sébastien Gerard, Isabelle Perseil****Session I**

- A Concrete Syntax for UML 2.1 Action Semantics Using +CAL.....217
Isabelle Perseil and Laurent Pautet

- An Execution Framework for MARTE-Based Models222
Chokri Mraidha, Yann Tangy, Christophe Jouvray, François Terrier, and Sébastien Gérard

- Dealing with AADL End-to-End Flow Latency with UML MARTE228
Su-Young Lee, Frédéric Mallet, and Robert de Simone

Session II

- Contract-Based Approach to Analyze Software Components.....237
A. Zitouni, L. Seinturier, and M. Boufaida

- Arcade-A Formal, Extensible, Model-Based Dependability Evaluation Framework.....243
Hichem Boudali, Pepijn Crouzen, Boudewijn R. Haverkort, Matthias Kuntz, and Mariëlle Stoelinga

- An Integrated MDA Approach with SysML and UML.....249
Matthew Clayton Hause and Francis Thom

Session III

- Code Generation from AADL to a Real-Time Operating System: An Experimentation Feedback
on the Use of Model Transformation.....257
Matthias Brun, Jérôme Delatour, and Yvon Trinquet

- AADL Execution Semantics Transformation for Formal Verification.....263
Thomas Abdoul, Joël Champeau, Philippe Dhaussy, Pierre Yves Pillain, and Jean-Charles Roger

- Automatic Composition of AADL Models for the Verification of Critical Component-Based
Embedded Systems.....269
Hugues Bulp, Étienne Borde, Grégory Haik, and Jean-François Tilman

Session IV

- Using AADL to Model a Protocol Stack277
Didier Delanote, Stefan Van Baelen, Wouter Joosen, and Yolande Berbers

- Modes in Asynchronous Systems282
Jean-François Rolland, Jean-Paul Bodeveix, Mamoun Filali , David Chemouil, and Dave Thomas

- A Study of the AADL Mode Change Protocol288
Dominique Bertrand, Anne-Marie Déplanche, Sébastien Faucon, and Olivier H. Roux

- Efficient Embedded Runtime Systems through Port Communication Optimization.....294
Peter H. Feiler

- Author Index.....301**