## 2015 3rd International Conference on Model-Driven Engineering and Software Development (MODELSWARD 2015)

Angers, Loire Valley, France 9-11 February 2015



**IEEE Catalog Number: ISBN:** 

CFP15YAX-POD 978-1-4673-8404-9

## **BRIEF CONTENTS**

Invited Speakers	IV
SPECIAL SESSIONS CHAIRS	IV
ORGANIZING AND STEERING COMMITTEES	V
PROGRAM COMMITTEE	VI
Auxiliary Reviewers	IX
SPECIAL SESSIONS PROGRAM COMMITTEE	X
SELECTED PAPERS BOOK	X
Foreword	XI
Contents	XIII

## **CONTENTS**

## INVITED SPEAKERS

KEYNOTE SPEAKERS	
Beyond Mere Logic - A Vision of Modeling Languages for the 21st Century $BranSelic$	IS-5
Once upon a Time, There Was Papyrus Sébastien Gérard	IS-7
Modeling and Execution of Software User Interfaces Marco Brambilla	IS-9
Model Driven Engineering and Functional Safety  Mark van den Brand	IS-11
Invited Lecture	
$\label{thm:constraint} \mbox{Model Repositories at the Enterprises and Systems Scale - The Modelio Constellation Solution \\ \mbox{\it Philippe Desfray}$	IS-15
MODELING LANGUAGES, TOOLS AND ARCHITECTURES	
FULL PAPERS	
Towards the Integration of Model-Driven Engineering, Software Product Line Engineering, and Software Configuration Management Felix Schwägerl, Thomas Buchmann, Sabrina Uhrig and Bernhard Westfechtel	Ę
Integration of Heterogeneous Modeling Languages via Extensible and Composable Language Components  Arne Haber, Markus Look, Antonio Navarro Perez, Pedram Mir Seyed Nazari, Bernhard Rumpe, Steven Völkel and Andreas Wortmann	19
Specification of Adaptable Model Migrations  Paola Vallejo, Mickaël Kerboeuf and Jean-Philippe Babau	32
Architectural View Driven Model Transformations for Supporting the Lifecycle of Parallel Applications  Ethem Arkin and Bedir Tekinerdogan	40
A Toolset for Simulink - Improving Software Engineering Practices in Development with Simulink Vera Pantelic, Steven Postma, Mark Lawford, Alexandre Korobkine, Bennett Mackenzie, Jeff Ong and Marc Bender	50
Model Query Translator - A Model-level Query Approach for Large-scale Models Xabier De Carlos, Goiuria Sagardui, Aitor Murguzur, Salvador Trujillo and Xabier Mendialdua	62
A Comparison of Mechanisms for Integrating Handwritten and Generated Code for Object-Oriented Programming Languages Timo Greifenberg, Katrin Hölldobler, Carsten Kolassa, Markus Look, Pedram Mir Seyed Nazari, Klaus Müller, Antonio Navarro Perez, Dimitri Plotnikov, Dirk Reiss, Alexander Roth, Bernhard Rumpe, Martin Schindler and Andreas Wortmann	74
A Formalisation of Analysis-based Model Migration  Ingrid Chieh Yu and Henning Berg	86

86

Johannes Iber, Nermin Kajtazovic, Andrea Höller, Tobias Rauter and Christian Kreiner	99
Towards Non-intrusive Composition of Executable Models Henning Berg and Birger Møller-Pedersen	111
Extending UML Templates towards Computability  José Farinha and Pedro Ramos	122
Software Architecture Design by Stepwise Model Transformations - A Comparative Case Study Fabian Gilson and Vincent Englebert	134
SHORT PAPERS	
Aggregate Callback - A Design Pattern for Flexible and Robust Runtime Model Building Gábor Kövesdán, Márk Asztalos and László Lengyel	149
A Novel Approach using Alloy in Domain-specific Language Engineering Rodrigo M. L. M. Moreira and Ana C. R. Paiva	157
Towards World Model-based Test Generation in Autonomous Systems  Anneliese Andrews, Mahmoud Abdelgawad and Ahmed Gario	165
Model-based Approach for Implementation of Software Configuration Management Process Arturs Bartusevics and Leonids Novickis	177
Architecture Framework for Modeling the Deployment of Parallel Applications on Parallel Computing Platforms  Bedir Tekinerdogan and Ethem Arkin	185
Towards Feature-driven Goal Fulfillment Analysis - A Feasibility Study Avjot Garcha Singh, Aida Omerovic, Franck Chauvel and Nicolas Ferry	193
A MapReduce-based Approach for Finding Inexact Patterns in Large Graphs Péter Fehér, Márk Asztalos, Tamás Mészáros and Laszlo Lengyel	205
Instantiation of Meta-models Constrained with OCL - A CSP Approach A. ferdjoukh, A. Baert, E. Bourreau, A. Chateau, R. Coletta and C. Nebut	213
Graphical Debugging of Distributed Applications - Using UML Object Diagrams to Visualize the State of Distributed Applications at Runtime  Andreas Koch and Albert Zündorf	223
Combined Modelling and Programming Support for Composite States and Extensible State Machines  Kjetil Andresen, Birger Møller-Pedersen and Ragnhild Kobro Runde	231
Automated Model-based Testing Based on an Agnostic-platform Modeling Language Concepción Sanz, Alejandro Salas, Miguel de Miguel, Alejandro Alonso, Juan Antonio de la Puente and Clara Benac	239
Automated DSL Construction Based on Software Product Lines Changyun Huang, Ataru Osaka, Yasutaka Kamei and Naoyasu Ubayashi	247
Integrating Existing Proprietary System Models into a Model-driven Test Process for an Industrial Automation Scenario Kai Beckmann	255

A Unified Formulation of Behavioral Semantics for SysML Models  Christoph Hilken, Jan Peleska and Robert Wille	263
DCCSS - A Meta-model for Dynamic Clinical Checklist Support Systems Shan Nan, Pieter Van Gorp, Hendrikus H. M. Korsten, Uzay Kaymak, Richard Vdovjak, Xudong Lu and Huilong Duan	272
A Survey of Object-Relational Transformation Patterns for High-performance UML-based Applications Nemanja Kojić and Dragan Milićev	280
Polymer - A Model-driven Approach for Simpler, Safer, and Evolutive Multi-objective Optimization Development Assaad Moawad, Thomas Hartmann, François Fouquet, Gregory Nain, Jacques Klein and Johann Bourcier	286
Automated State-based Online Testing Real-time Embedded Software with RTEdge Wafa Hasanain, Yvan Labiche and Serban Gheorghe	294
Technology Independent Honeynet Description Language Wenjun Fan, David Fernández and Víctor A. Villagrá	303
Disciplined Approach for Transformation CIM to PIM in MDA Yassine Rhazali, Youssef Hadi and Abdelaziz Mouloudi	312
Towards Traceability Modeling for the Engineering of Heterogeneous Systems Nasser Mustafa and Yvan Labiche	321
LCL - A Graphical Meta-Language for Specification of Language Constraints	329
Terje Gjøsæter	
Using a Projectional Editor to Implement Interactive Model Navigation and View Control  Tony Clark and Balbir Barn	ÞÐŒ
Using a Projectional Editor to Implement Interactive Model Navigation and View Control	<b>ÞÆ</b> 0E 346
Using a Projectional Editor to Implement Interactive Model Navigation and View Control  Tony Clark and Balbir Barn  A Combined Graph-based Approach for Systems Design And Verification	
Using a Projectional Editor to Implement Interactive Model Navigation and View Control Tony Clark and Balbir Barn  A Combined Graph-based Approach for Systems Design And Verification  Najet Zoubeir and Adel Khalfallah  Metamodelling with Formal Semantics with Application to Access Control Specification	346
Using a Projectional Editor to Implement Interactive Model Navigation and View Control Tony Clark and Balbir Barn  A Combined Graph-based Approach for Systems Design And Verification Najet Zoubeir and Adel Khalfallah  Metamodelling with Formal Semantics with Application to Access Control Specification Jamal Abd-Ali, Karim El Guemhioui and Luigi Logrippo  The Effect of Concurrent Programming Idioms on Verification	346 354
Using a Projectional Editor to Implement Interactive Model Navigation and View Control Tony Clark and Balbir Barn  A Combined Graph-based Approach for Systems Design And Verification Najet Zoubeir and Adel Khalfallah  Metamodelling with Formal Semantics with Application to Access Control Specification Jamal Abd-Ali, Karim El Guemhioui and Luigi Logrippo  The Effect of Concurrent Programming Idioms on Verification David Harel, Guy Katz, Assaf Marron and Gera Weiss  Traceability and Interfacing Between Requirements Engineering and UML Domains using the Standardized ReqIF Format	346 354 363
Using a Projectional Editor to Implement Interactive Model Navigation and View Control Tony Clark and Balbir Barn  A Combined Graph-based Approach for Systems Design And Verification Najet Zoubeir and Adel Khalfallah  Metamodelling with Formal Semantics with Application to Access Control Specification Jamal Abd-Ali, Karim El Guemhioui and Luigi Logrippo  The Effect of Concurrent Programming Idioms on Verification David Harel, Guy Katz, Assaf Marron and Gera Weiss  Traceability and Interfacing Between Requirements Engineering and UML Domains using the Standardized ReqIF Format Arne Noyer, Padma Iyenghar, Elke Pulvermueller, Florian Pramme and Gert Bikker  Support of Scenario Creation by Generating Event Lists from Conceptual Models	346 354 363 370
Using a Projectional Editor to Implement Interactive Model Navigation and View Control Tony Clark and Balbir Barn  A Combined Graph-based Approach for Systems Design And Verification Najet Zoubeir and Adel Khalfallah  Metamodelling with Formal Semantics with Application to Access Control Specification Jamal Abd-Ali, Karim El Guemhioui and Luigi Logrippo  The Effect of Concurrent Programming Idioms on Verification David Harel, Guy Katz, Assaf Marron and Gera Weiss  Traceability and Interfacing Between Requirements Engineering and UML Domains using the Standardized ReqIF Format Arne Noyer, Padma Iyenghar, Elke Pulvermueller, Florian Pramme and Gert Bikker  Support of Scenario Creation by Generating Event Lists from Conceptual Models Kenta Goto, Shinpei Ogata, Junko Shirogane, Takako Nakatani and Yoshiaki Fukazawa  On Languages for Conceptual Data Modeling in Multi-disciplinary Space Systems Engineering	346 354 363 370 376

A Toolchain for Model-based Design and Testing of Access Control Systems Said Daoudagh, Donia El Kateb, Francesca Lonetti, Eda Marchetti and Tejeddine Mouelhi	411
A Mechanism for Data Interchange Between Embedded Software Sub-systems Developed using Heterogenous Modeling Domains  Padma Iyenghar, Benjamin Samson, Michael Spieker, Arne Noyer, Juergen Wuebbelmann, Clemens Westerkamp and Elke Pulvermueller	419
Model-driven Development for User-centric Well-being Support - From Dynamic Well-being Domain Models to Context-aware Applications Steven Bosems and Marten van Sinderen	425
METHODOLOGIES, PROCESSES AND PLATFORMS	
FULL PAPERS	
Evolving Legacy Model Transformations to Aggregate Non Functional Requirements of the Domain Joseba A. Agirre, Goiuria Sagardui and Leire Etxeberria	437
SysML Modeling for Embedded Systems Design Optimization - A Case Study Patrick Leserf, Pierre de Saqui-Sannes, Jérôme Hugues and Khaled Chaaban	449
SHORT PAPERS	
Tool Integration by Models, Not Only by Metamodels - Applying Modeling to Tool Integration $W\!eiqing\ Z\!hang$	461
Knowledge Modeling in the Health Care Domain to Support Software Development & Maintenance Thomas Reichherzer, John Coffey, Bilal Gonen and Irad Gillett	470
Discovering Models of Parallel Workflow Processes from Incomplete Event Logs Julijana Lekic and Dragan Milicev	477
Contextual Representations for Enterprise Model Application (C.R.E.M.A.) Nikolaus Wintrich and Malte Meißner	483
A Modular Method for Global System Behaviour Specification Urooj Fatima and Rolv Bræk	490
Using Software Categories for the Development of Generative Software Pedram Mir Seyed Nazari and Bernhard Rumpe	498
APPLICATIONS AND SOFTWARE DEVELOPMENT	
FULL PAPER	
Model-Driven Engineering of a Railway Interlocking System Fabio Scippacercola, Roberto Pietrantuono, Stefano Russo and András Zentai	509
SHORT PAPERS	
Towards Managing Data Variability in Multi Product Lines Niloofar Khedri and Ramtin Khosravi	523

Building a Privacy Accountable Surveillance System  Francisco Jaime, Antonio Maña, Zhendong Ma, Christian Wagner, Daniel Hovie and Mathias Bossuet	646
SysML-Sec - A Model Driven Approach for Designing Safe and Secure Systems Yves Roudier and Ludovic Apvrille	655
SALT Frameworks to Tackle Surveillance and Privacy Concerns Antonio Kung, Christophe Jouvray and Fanny Coudert	665
Model-based Security Analysis and Applications to Security Economics  Jan Jürjens and Amir Shayan Ahmadian	ÞÐŒ
AUTHOR INDEX	679