

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Switzerland

John C. Mitchell

Stanford University, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz

University of Bern, Switzerland

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

University of Dortmund, Germany

Madhu Sudan

Massachusetts Institute of Technology, MA, USA

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Moshe Y. Vardi

Rice University, Houston, TX, USA

Gerhard Weikum

Max-Planck Institute of Computer Science, Saarbruecken, Germany

Thomas Kühne (Ed.)

Models in Software Engineering

Workshops and Symposia at MoDELS 2006
Genoa, Italy, October 1-6, 2006
Reports and Revised Selected Papers



Springer

Volume Editor

Thomas Kühne
TU Darmstadt
FG Metamodellierung
Hochschulstr. 10, 64289 Darmstadt, Germany
E-mail: kuehne@informatik.tu-darmstadt.de

Library of Congress Control Number: 2006939519

CR Subject Classification (1998): D.2, D.3, I.6, K.6

LNCS Sublibrary: SL 2 – Programming and Software Engineering

ISSN 0302-9743
ISBN-10 3-540-69488-9 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-69488-5 Springer Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

Springer is a part of Springer Science+Business Media

springer.com

© Springer-Verlag Berlin Heidelberg 2007
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 11969273 06/3142 5 4 3 2 1 0

Preface

Following tradition, MoDELS 2006 hosted a number of workshops and symposia. They provided collaborative forums for groups to conduct intensive discussions and complemented the main conference by focusing on important subject areas and enabling a high degree of interactivity.

MoDELS 2006 featured 11 workshops and three symposia during the first three days of the conference. In addition to the Doctoral and Educators symposia, which were already successfully held in 2005, a symposium on UML semantics was held for the first time at MoDELS 2006.

Keeping a time-tested tradition of the MoDELS/UML series, I formed an international workshop selection committee composed of the following researchers:

- Jean-Michel Bruel (University of Pau, France)
- Martin Glinz (Universität Zürich, Switzerland)
- Reiko Heckel (University of Leicester, UK)
- Jens Jahnke (University of Victoria, Canada)
- Hans Vangheluwe (McGill University, Canada)
- Jon Whittle (George Mason University, USA)

Out of 18 workshop proposals, we selected 11 workshops and the symposium on UML semantics. Because of the way the latter was organized we, as well as the symposium organizers, agreed that it fitted more appropriately under the heading of a symposium.

Six of the workshops have a history in the MoDELS/UML series and represented a continuation of ongoing discussions on established topics. The other five workshops featured new topics, further broadening the scope of MoDELS, beyond its traditional focus on UML. We believe this blend of established and innovative workshop themes made the MoDELS 2006 workshops and symposia a success worth attending. The summaries of all symposia and workshops plus revised versions of the two respective best papers are included in these proceedings.

I am grateful to the members of the Selection Committee who accepted my invitation and worked diligently to select the workshops with the maximum research relevance and highest potential of attracting participants. Gianna Reggio was an invaluable help in resolving organizational issues and my predecessor Jean-Michel Bruel immensely eased my work by generously sharing his experience.

November 2006

Thomas Kühne
Workshop Chair
MoDELS 2006

Sponsors



DISI, Dipartimento di Informatica e Scienze dell'Informazione, Università di Genova
(www.disi.unige.it)



ACM Special Interest Group on Software Engineering
(www.sigsoft.org)



IEEE Computer Society
(www.computer.org)

Table of Contents

W1 – Aspect-Oriented Modeling

9th International Workshop on Aspect-Oriented Modeling	1
<i>Jörg Kienzle, Dominik Stein, Walter Cazzola, Jeff Gray, Omar Aldawud, and Tzilla Elrad</i>	
Modeling Features in Aspect-Based Product Lines with Use Case Slices: An Exploratory Case Study	6
<i>Roberto E. Lopez-Herrejon and Don Batory</i>	
Join Point Patterns: A High-Level Join Point Selection Mechanism	17
<i>Walter Cazzola and Sonia Pini</i>	

W2 – Critical Systems Development

Critical Systems Development Using Modeling Languages – CSDUML 2006 Workshop Report	27
<i>Geri Georg, Siv Hilde Houmb, Robert France, Steffen Zschaler, Dorina C. Petriu, and Jan Jürjens</i>	
Modeling an Electronic Throttle Controller Using the Timed Abstract State Machine Language and Toolset	32
<i>Martin Ouimet, Guillaume Berteau, and Kristina Lundqvist</i>	
Model Checking of UML 2.0 Interactions	42
<i>Alexander Knapp and Jochen Wuttke</i>	

W3 – Reverse Engineering

3rd International Workshop on Metamodels, Schemas, Grammars and Ontologies	52
<i>Jean-Marie Favre, Dragan Gašević, Ralf Lämmel, and Andreas Winter</i>	
A Unified Ontology-Based Process Model for Software Maintenance and Comprehension	56
<i>Juergen Rilling, Yonggang Zhang, Wen Jun Meng, René Witte, Volker Haarslev, and Philippe Charland</i>	
Formalizing the Well-Formedness Rules of EJB3QL in UML + OCL	66
<i>Miguel Garcia</i>	

W4 – Quality in Modeling

The 1 st Workshop on Quality in Modeling	76
<i>Ludwik Kuzniarz, Jean Louis Sourouille, and Miroslaw Staron</i>	
Consistency of Business Process Models and Object Life Cycles	80
<i>Ksenia Ryndina, Jochen M. Küster, and Harald Gall</i>	
A Qualitative Investigation of UML Modeling Conventions	91
<i>Bart Du Bois, Christian F.J. Lange, Serge Demeyer, and Michel R.V. Chaudron</i>	

W5 – Advanced User Interfaces

Model Driven Development of Advanced User Interfaces (MDDAUI) – MDDAUI'06 Workshop Report	101
<i>Andreas Pleuß, Jan van den Bergh, Stefan Sauer, Heinrich Hußmann, and Alexander Bödcher</i>	
A Model-Driven Approach to the Engineering of Multiple User Interfaces	106
<i>Goetz Botterweck</i>	
Model-Driven Dynamic Generation of Context-Adaptive Web User Interfaces	116
<i>Steffen Lohmann, J. Wolfgang Kaltz, and Jürgen Ziegler</i>	

W6 – Real-Time and Embedded Systems

Modelling and Analysis of Real Time and Embedded Systems – Using UML	126
<i>Susanne Graf, Sébastien Gérard, Øystein Haugen, Iulian Ober, and Bran Selic</i>	
Time Exceptions in Sequence Diagrams	131
<i>Oddleif Halvorsen, Ragnhild Kobro Runde, and Øystein Haugen</i>	
Applying Model Intelligence Frameworks for Deployment Problem in Real-Time and Embedded Systems	143
<i>Andrey Nechypurenko, Egon Wuchner, Jules White, and Douglas C. Schmidt</i>	

W7 – OCL

OCL for (Meta-)Models in Multiple Application Domains	152
<i>Dan Chiorean, Birgit Demuth, Martin Gogolla, and Jos Warmer</i>	

OCL-Based Validation of a Railway Domain Profile	159
<i>Kirsten Berkenkötter</i>	

OCL Support in an Industrial Environment	169
<i>Michael Altenhofen, Thomas Hettel, and Stefan Kusterer</i>	

W8 – Integrating MDA and V&V

Report on the 3rd MoDeVa Workshop – Model Design and Validation	179
<i>Benoît Baudry, David Hearnden, Nicolas Rapin, and Jörn Guy Süß</i>	

Towards Model-Driven Unit Testing	182
<i>Gregor Engels, Baris Güldali, and Marc Lohmann</i>	

Validation of Model Transformations – First Experiences Using a White Box Approach	193
<i>Jochen M. Küster and Mohamed Abd-El-Razik</i>	

W9 – Model Size Metrics

Summary of the 2006 Model Size Metrics Workshop	205
<i>Frank Weil and Andriy Neczwid</i>	

Model Size Matters	211
<i>Christian F.J. Lange</i>	

On the Application of Software Metrics to UML Models	217
<i>Jacqueline A. McQuillan and James F. Power</i>	

W10 – Models@run.time

Summary of the Workshop Models@run.time at MoDELS 2006	227
<i>Nelly Bencomo, Gordon Blair, and Robert France</i>	

Using Runtime Models to Unify and Structure the Handling of Meta-information in Reflective Middleware	232
<i>Fábio Moreira Costa, Lucas Luiz Provensi, and Frederico Forzani Vaz</i>	

Applying OMG D&C Specification and ECA Rules for Autonomous Distributed Component-Based Systems	242
<i>Jérémy Dubus and Philippe Merle</i>	

W11 – Multi-Paradigm Modeling

Summary of the Workshop on Multi-Paradigm Modeling: Concepts and Tools 252
Holger Giese, Tihamér Levendovszky, and Hans Vangheluwe

Think Global, Act Local: Implementing Model Management with Domain-Specific Integration Languages 263
Thomas Reiter, Kerstin Altmanninger, and Werner Retschitzegger

S1 – Doctoral Symposium

MoDELS 2006 Doctoral Symposium 277
Gabriela Arévalo and Robert Pettit

Model Driven Security Engineering for the Realization of Dynamic Security Requirements in Collaborative Systems 278
Muhammad Alam

S2 – Educators Symposium

Educators’ Symposium at MoDELS 2006 288
Ludwik Kuzniarz

If You’re Not Modeling, You’re Just Programming: Modeling Throughout an Undergraduate Software Engineering Program 291
James Vallino

Teaching Software Modeling in a Simulated Project Environment 301
Robert Szmurło and Michał Śmiątek

Repository for Model Driven Development (ReMoDD) 311
Robert France, Jim Bieman, and Betty H.C. Cheng

S3 – A Formal Semantics for UML

2nd UML 2 Semantics Symposium: Formal Semantics for UML 318
Manfred Broy, Michelle L. Crane, Juergen Dingel, Alan Hartman, Bernhard Rumpe, and Bran Selic

A UML Simulator Based on a Generic Model Execution Engine 324
Andrei Kirshin, Dolev Dotan, and Alan Hartman

Queries and Constraints: A Comprehensive Semantic Model for UML2 327
Ingolf H. Krüger and Massimiliano Menarini

Analysis of UML Activities with Dynamic Meta Modeling Techniques	329
<i>Christian Soltenborn and Gregor Engels</i>	
Author Index	331