Guest editorial to the special issue on MODELS 2010

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Welcome to this special issue of *Software and Systems Modeling* devoted to selected papers of MODELS 2010. The MODELS series of conferences is the premier venue for exchange of innovative ideas and practical experience focusing on a very important new technical discipline: model-driven software and systems engineering. The expansion of this discipline is a direct consequence of the increasing significance and success of model-based methods in practice. Numerous efforts resulted in the invention of concepts, languages and tools for the definition, analysis, transformation, and verification of domain-specific modeling languages and general-purpose modeling language standards, as well as their use for software and systems engineering.

MODELS 2010, the 13th edition of the conference series took place in Oslo, Norway, October 3–8, 2010, along with numerous satellite workshops, symposia and tutorials. The conference was fortunate to have three prominent keynote speakers: Ole Lehrmann Madsen from Aarhus University, Denmark, Edward A. Lee from U.C. Berkeley, USA and Pamela Zave from AT&T Laboratories, USA.

To provide a broader forum for reporting on scientific progress, as well as on experience stemming from practical applications of model-based methods, the 2010 conference accepted submissions in two distinct tracks: Foundations and Applications. The primary objective of the first track was to present new research results dedicated to advancing the state-of-the-art of the discipline, whereas the second aimed to provide a realistic and verifiable picture of the current state-of-the-practice of model-based engineering, so that the

broader community could be better informed of the capabilities and successes of this relatively young discipline.

The program committee of MODELS 2010 received a total of 252 submissions (207 in the Foundations and 45 in the Applications track) from 34 countries. An interesting fact is that 21 % of the papers were co-authored by researchers from different countries, indicating that the field enjoys a strong international collaboration. The program committees selected a total of 54 papers for presentation at the conference (43 in the Foundations and 11 in the Applications track).

After the conference, the editors in chief of the journal *Software and Systems Modeling* asked the program committee to propose a selection of the best papers from the conference for consideration for publication in a special issue. The program committee selected 14 papers and invited their authors to extend the original conference papers with more research results, taking advantage of the longer format of journal publications. At least three experts reviewed each submission and each accepted paper underwent at least two rounds of revisions. Seven papers were eventually selected and are presented in this special issue. I would like to thank all authors and reviewers for their hard work.

In the paper “From Types to Type Requirements: Genericity for Model-Driven Engineering”, the authors Juan de Lara and Esther Guerra address an important problem for model-driven engineering: how to approach the definition of reusable (meta) model templates in a sound and expressive way. The paper advocates the use of genericity in modeling and meta-modeling and proposes some advanced genericity constructs that go beyond what is currently available in MDE standards such as MOF or UML.

The paper “On Model Compatibility with Referees and Contexts”, by Thomas Kühne, discusses different interpretations for the specialization relationship, together with the kind of compatibility that the instances of models related

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through these relationships satisfy in each case. The author also proposes the notion of “referee” as a mechanism to customize specialization relationships, as well as “contexts” to restrict the scope for a specialization relation.

In the paper “Design for Service Compatibility–Behavioral Compatibility Checking and Diagnosis”, the authors Georg Grossmann, Michael Schrefl and Markus Stumptner propose a model-driven approach for creating consistent service orchestrations. The paper provides formal criteria for service consistency that can be checked in terms of local model properties and gives a design methodology for developing services that are guaranteed to be interoperable. The goal is to study service compatibility on a platform-independent level, before translation into orchestration specifications.

The paper “Detection and Resolution of Conflicting Change Operations in Version Management of Process Models”, by Christian Gerth, Jochen Küster, Markus Luckey and Gregor Engels, addresses the problem of detection and resolution of conflicts in change operations for business process models. A new method for computing conflicts efficiently and precisely based on a term formalization of process models is proposed. Approaches for the resolution of detected conflicts between change operations based on different strategies are also discussed.

The paper “A Visual Language for Modeling and Executing Traceability Queries” by Patrick Maeder and Jane Huang introduces a UML-inspired graphical language (VTML) for defining queries on a traceability model. The expressiveness of the language is discussed and assessed through a case study. Empirical results from a usability study demonstrate that VTML queries are faster to read/write and more accurate than similar queries written in SQL.

In the paper “Engineering Model Transformations with *transML*”, the authors Esther Guerra, Juan de Lara, Dimitrios Kolovos, Richard Paige, and Osmar Santos present *transML*, a family of modeling languages covering the entire life cycle

of model transformation development from requirements to testing. The paper shows the detailed design of each development phase language, explaining how *transML* can be used together with other transformation languages such as ETL and QVT.

Finally, the paper “On the Reuse and Recommendation of Model Refactoring Specifications” by Mirko Seifert, Jan Reimann, and Uwe Assmann, presents an approach for specifying refactorings applicable to models formulated in arbitrary DSLs. The challenge is to specify reusable refactorings which are able to take into account the semantics of a concrete modeling language. The proposed solution uses “role models representing structural properties necessary for certain model transformations, which are mapped to the metamodel of a given DSL.

Author Biography

Dorina C. Petriu is a full professor in the Department of Systems and Computer Engineering at Carleton University, Ottawa, ON, Canada. Her main research interests are in the areas of software performance modeling and model-driven development, with emphasis on integrating the analysis of non-functional properties into the software development process. She served in the steering and program committees of numerous international conferences and workshops.

Dr. Petriu is a Fellow of the Canadian Academy of Engineering and a Fellow of the Engineering Institute of Canada.