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GUEST EDITORIAL

Guest editorial to the special section on model transformation

Jean Bézivin · Alfonso Pierantonio · Antonio Vallecillo · Jeff Gray

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1 Introduction

Models play a cornerstone role in Model-Driven Engineering (MDE). The use of models opens up new possibilities for creating, analyzing, and manipulating systems through various types of tools and languages. Each model usually addresses one set of related concerns, and transformations between models provide a chain that enables the automated development of a system from its corresponding models. Model transformation specification, implementation, and execution are the major parts of this process. Furthermore, model transformations may also be realized using models, and are, therefore, an integral part of a model-driven approach.

Model transformations need specialized support in several aspects in order to realize their full potential for system modelers, transformation developers, and tool vendors. The problem goes beyond having specific languages to represent model transformations; we also need to understand the key concepts and operators supporting those languages, their semantics and their structuring mechanisms and properties (e.g., modularity, composability, and parameterization). In addition, model transformations can be stored in repositories as reusable assets, where they can be discovered and reused. There is also a need to chain and combine model transformations in order to produce new and more powerful transformations. Moreover, they need to be fully integrated into software development methodologies supported by appropriate tools and environments.

The objective of this special section is to provide a representative sample of advanced research emerging from the field of model transformation. The selected papers provide an overview of current open issues and identify potential lines for further research.

J. Bézivin (✉)
University of Nantes and INRIA, Nantes cedex 3, France
e-mail: Jean.Bezivin@univ-nantes.fr

A. Pierantonio
University of L'Aquila, L'Aquila, Italy
e-mail: alfonso@di.univaq.it

A. Vallecillo
University of Málaga, Málaga, Spain
e-mail: av@lcc.uma.es

J. Gray
University of Alabama at Birmingham, Birmingham, USA
e-mail: gray@cis.uab.edu

2 Scope

The second edition of the Model Transformation (MT) Track at the ACM 22nd Annual SAC meeting was dedicated to these topics. It was held on 11–15 March 2007, in Seoul, Korea, and was hosted by the Seoul National University and Suwon University. The Track brought together researchers and practitioners to share experiences in using model transformations and to explore the practical problems of existing languages, tools, and environments for transforming models. This track was very successful. Seventeen papers were finally accepted for presentation, covering a wide range of issues: definition of model transformation languages; refactoring and modularization; and use of model transformations in specific domains, such as Web applications and software architectures [1].

3 Selected papers for this special section

From the 17 papers presented at the Track, we selected 6 candidate papers for this special section based on the Track

reviewers' comments and scores, and the quality of their presentations at the Track. The authors of these papers submitted an extended version that was considered for publication in this special section. The papers underwent a thorough peer review process, using two rounds of reviews, and all papers were refereed by at least three well-known experts in the field. The reviewers were also members of the Program Committee of both 2006 and 2007 MT Track editions, and included Andreas Winter, Andy Schürr, Antonio Cicchetti, Dániel Varró, Davide Di Ruscio, Frédéric Jouault, Günter Kniesel, Ivan Kurtev, Jordi Cabot, Laurie Tratt, Marten Steen, Michael Lawley, Nicolas Rouquette, Simon Helsen, and Vicente Pelechano. At the end of the review process, the following three papers were selected for this special section.

- Jesús Sánchez Cuadrado and Jesús García Molina, in their paper "Modularization of Model Transformations through a Phasing Mechanism," present a phasing mechanism in the context of rule-based transformation languages. They explain the structure and the behavior of this rule scheduling and organization mechanism, and how it can be integrated in a language, hence promoting modularity and internal transformation composition. In addition, the authors show how some common model transformation problems can be easily solved with this mechanism.
- Marcos Didonet del Fabro and Patrick Valduriez, in their paper entitled "Towards the Efficient Development of Model Transformations using Model Weaving and Matching Transformations," introduce a novel approach that uses matching transformations and weaving models to semi-automate the development of model transformations.
- Zoltán Balogh and Dániel Varró, in their paper "Model Transformation by Example Using Inductive Logic Programming" show how model transformation by example can be effectively realized by using inductive logic programming. Model transformation by example is a novel approach in MDE to derive model transformation rules from an initial prototypical set of interrelated source and target models, which describes critical cases of the model transformation problem in a declarative way. In their paper, the authors automate this approach by using inductive logic programming, which aims at the inductive construction of first-order clausal theories from examples and background knowledge.

These three papers contribute in different aspects to the area of model transformation, from its foundations to the potential benefits it may bring to the emerging field of MDE.

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Reference

1. Bézivin J., Gray J., Pierantonio A., Vallecillo A.: Model transformation (MT 2007). In: Proc. of ACM/SAC 2007, March 2007. ACM Press, Seoul