

# Welcome to the 15<sup>th</sup> Workshop on Domain-Specific Modeling

## Preface

Domain-Specific Modeling (DSM) languages provide a viable and time-tested solution for continuing to raise the level of abstraction, and thus productivity, beyond coding, making systems development faster and easier. When accompanied with suitable automated modeling tools and generators it delivers to the promises of continuous delivery and devops.

In Domain-Specific Modeling (DSM) the models are constructed using concepts that represent things in the application domain, not concepts of a given programming language. The modeling language follows the domain abstractions and semantics, allowing developers to perceive themselves as working directly with domain concepts. Together with frameworks and platforms, DSM can automate a large portion of software production. This automation is possible because of domain-specificity: both the modeling language and code generators fit to the requirements of a narrowly defined domain, often inside one organization only.

The 15<sup>th</sup> workshop on Domain-Specific Modeling will provide a forum for presenting research work, experience reports and language demonstrations. This year we received 17 papers, of which we accepted 12. Each paper was reviewed by three persons. We would like to thank program committee for their help and contribution during the review process. The accepted papers are organized in the program into four categories: experiences on language engineering, code generation, language evolution and use, and language engineering perspectives.

Following the workshop theme we also have interactive workgroup discussions. Participants choose the topics like identify new research questions or focus on more detail on topics presented earlier in the workshop.

The DSM workshop is one of longest running series of workshops at SPLASH/OOPSLA, this being the 15th anniversary of the series and we plan a little celebration the workshop.

October 2015  
Pittsburgh, Pennsylvania

# **15<sup>th</sup> WORKSHOP ON DOMAIN-SPECIFIC MODELING**

**27 October 2015, Pittsburgh, Pennsylvania, United States**

## **Program Committee**

Ankica Barisic, Universidade Nova de Lisboa, PT  
Christian Berger, University of Gothenburg, SE  
Filipe Correia, Universidade do Porto, PT  
Davide Di Ruscio, Università degli Studi dell'Aquila, IT  
Michalis Famelis, University of Toronto, CA  
Oystein Haugen, Østfold University College, NO  
Steven Kelly, MetaCase, FI  
Thomas Kuehne, Victoria University of Wellington, NZ  
Tanja Mayerhofer, Vienna University of Technology, AT  
Bernhard Rumpe, RWTH Aachen University, DE  
Kari Smolander, Lappeenranta University of Technology, FI  
Yu Sun, Cal Poly Pomona, US  
Naoyasu Ubayashi, Kyushu University, JA  
Timo Wegeler, independent, DE

## **Organizing Committee**

Jeff Gray, University of Alabama, US  
Jonathan Sprinkle, University of Arizona, US  
Juha-Pekka Tolvanen, MetaCase, FI  
Matti Rossi, Aalto University School of Economics, FI

## Table of contents

Domain Specific Modelling for Clinical Research Jim Davies, Jeremy Gibbons, Adam Milward, David Milward, Seyyed Shah, Monika Solanki and James Welch	1
CHARIOT: A Domain Specific Language for Extensible Cyber-Physical Systems Subhav Pradhan, Abhishek Dubey, Aniruddha Gokhale and Martin Lehofer	7
Experience Report: Constraint-Based Modeling of Autonomous Vehicle Trajectories Kennon McKeever, Yegeta Zeleke, Matt Bunting and Jonathan Sprinkle	13
Adaptable Symbol Table Management by Meta Modeling and Generation of Symbol Table Infrastructures Katrin Hölldobler, Pedram Mir Seyed Nazari and Bernhard Rumpe	19
Automating Engineering with a Domain-Specific Language and a Code Generator Al Niessner, Oh-Ig Kwoun, Belinda Randolph and Honghanh Nguyen	25
Management of Guided and Unguided Code Generator Customizations by Using a Symbol Table Pedram Mir Seyed Nazari, Alexander Roth and Bernhard Rumpe	31
Mixed Generative and Handcoded Development of Adaptable data-centric Business Applications (demo) Pedram Mir Seyed Nazari, Alexander Roth and Bernhard Rumpe	36
Reusing Legacy DSLs with Melange (demo) Thomas Degueule, Benoit Combemale, Arnaud Blouin and Olivier Barais.	39
Supporting Users to Manage Breaking and Unresolvable Changes in Coupled Evolution Juri Di Rocco, Davide Di Ruscio, Ludovico Iovino and Alfonso Pierantonio	42
Towards Improving Software Security using Language Engineering and mbeddr C Markus Voelter, Zaur Molotnikov and Bernd Kolb	49
Extensible Visual Constraint Language Brian Broll and Akos Ledeczki	57
Systematic Evaluation of Three Data Marshalling Approaches for Distributed Software Systems Hugo Andrade, Federico Giaimo, Christian Berger and Ivica Crnkovic	63