6th International Workshop on Domain-Specific Languages and models for ROBotic systems
(DSLRob-15)

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After the overwhelming push towards the design of robotics software platforms (e.g. ROS, Orocos, SmartSoft, OpenRTM, etc.) we now need to make robotics programming and configuration as accessible as possible to application domain experts. Domain-Specific Languages (DSLs) and Model-driven Engineering (MDE) are emerging areas of interest in the robotics research community, which have been instrumental for resolving complex issues in a wide range of domains (e.g. distributed and modular robotics, control, and vision) and have the potential for significantly facilitating how robots are programmed.

The goal of this workshop is to bring together robotics researchers working with DSLs and models in different aspects of robotics. The challenge of building complex systems that compose several lower-level models or domain-specific languages is considered of special interest this year.

The workshop will focus on the use of Domain-Specific Languages and Models for Robotic Systems. The main objective of this workshop is a cross-pollination of ideas between robotics researchers in DSLs and models from different domains. DSLs and models are key elements in many robotic systems presented at leading conferences such as IROS, ICRA and SIMPAR, but the domain-centric structure of the typical robotics conference and the limited amount of time assigned to the paper presentations do not provide enough room for discussion and exchange of ideas regarding MDE, DSLs and models.

The intended audience is those robotics researchers throughout the entire robotics community who use DSLs and models as a key component of their robotics software infrastructure. In addition, robotics researchers with an interest in modern approaches to solving complex software-related issues will find the workshop inspirational.
1st DSLRob 2010 at IROS 2010 (Taipei)
4 papers
2nd DSLRob 2011 co-located at IROS 2011 (San Francisco)
4 papers
3rd DSLRob 2012 at SIMPAR 2012 (Tsukuba)
6 papers
4th DSLRob 2013 at University of Tokyo (co-located at IROS 2013)
7 papers
5th DSLRob 2014 at SIMPAR 2014 (Bergamo)
6 papers
6th DSLRob 2015 at IROS 2015 (Hamburg)

• 6 Papers
• 2 Invited Talks
  • Dr. Markus Völter, Independent Researcher, Consultant, Coach for itemis AG in Stuttgart
  • Dr. Arne Hamann, Software-Intensive Systems, Robert Bosch GmbH
• 2 Late Breaking Results with Posters
• Scientific Community Reports
This workshop will focus on the use of Domain-Specific Languages and Models for Robotic Systems. Topics that are of special interest include:

- domain-specific languages for robotics, languages to teach robotics, visual languages for robotics
- domain-specific languages to express reactive behaviors, composition of behaviors, motion description languages (MDL),
- domain-specific languages to express uncertainty, modeling of physical systems, real-time constraints,
- domain-specific languages to describe cooperative robotics and modular robotics systems,
- models to represent robotics software architectures and their variability,
- runtime models for reasoning and dynamic adaptation,
- tool support and frameworks for describing and manipulating DSLs and models for robotic systems,
- code generation and code transformation for robotics systems, variability in robotic systems,
- frameworks to combine DSLs in a uniform manner,
- benchmarks to compare the use of DSLs vs general-purpose programming languages, and
- programming languages in the context of robotic systems
Program committee

Geoffrey Biggs, National Institute of Advanced Industrial Science and Technology (AIST), Japan
Mirko Bordignon, Fraunhofer IPA, Germany
Noury Bouraquad, Université de Lille Nord de France, Ecole des Mines de Douai, France
Luc Fabreze, Ecole des Mines Douai, France
Johan Fabry, PLEIAD lab – Department of Computer Science (DCC), University of Chile
Nico Hochgeschwender, Bonn-Rhein-Sieg University, Germany
Juan F. Inglés-Romero, Technical University of Cartagena, Spain
Alex Lotz, Ulm University of Applied Sciences, Germany
Ali Paikan, Italian Institute of Technology (IIT), Italy
Andreas Wortmann, RWTH Aachen University, Germany
Mikal Ziane, Laboratoire d’Informatique de Paris 6 (LIP6), France
08:30 – 08:45  Opening Remarks and Introduction of Participants
08:45 - 09:30  Invited Keynote by Dr. Arne Hamann, Robert Bosch GmbH
   What high-level software engineering in robotics could learn from embedded software engineering (and vice versa)?
09:30 - 10:00  Alex Lotz, Arne Hamann, Ingo Lütkebohle, Dennis Stampfer, Matthias Lutz and Christian Schlegel
   Modeling Non-Functional Application Domain Constraints for Component-Based Robotics Software Systems
10:00 - 10:30  COFFEE BREAK
10:30 - 11:00  André Dietrich, Sebastian Zug, Luigi Nardi and Jörg Kaiser
   Reasoning in Complex Environments with the SelectScript Declarative Language
11:00 - 11:30  Arvid Butting, Bernhard Rumpe, Christoph Schulze, Ulrike Thomas and Andreas Wortmann
   Modeling Reusable, Platform-Independent Robot Assembly Processes
11:30 - 12:00  Stefan Zander, Georg Heppner, Georg Neugschwandtner, Ramez Awad, Marc Essinger and Nadia Ahmed
   A Model-Driven Engineering Approach for ROS using Ontological Semantics
12:00 - 12:30  Huaxi Yulin Zhang and Lei Zhang
   Towards An Architecture-Centric Approach to Manage Variability of Cloud Robotics
12:30 - 14:00  LUNCH BREAK
14:00 - 14:45  Invited Keynote by Dr. Markus Völter, Independent Researcher, Consultant, Coach for itemis AG Stuttgart
   State of the art in language workbenches and development of DSLs for embedded software
14:45 - 15:15  Johann Thor Mogensen Ingibergsson, Ulrik Schultz and Dirk Kraft
   Towards Declarative Safety Rules for Perception Specification Architectures
15:15 - 15:30  Lightning Talks on Late-Breaking Results
15:30 - 16:00  COFFEE BREAK
16:00 - 16:30  Poster Session
16:30 - 17:00  Report on activities and discussion on topics from RAS TC-SOFT meeting
17:00 - 17:30  Report from and discussion on euRobotics Topic Group on Software Systems Engineering
17:30 - 18:00  Report from and discussion on the DSL Zoo Initiative on a Reference Collection of DSLs in Robotics
18:00 - 18:30  Concluding discussion: identification of research challenges, plans for DSLRob 2016
18:30  End

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