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Summary of Workshop on Model Driven Engineering, Verification and Validation (MoDeVVa'21)

Saad Bin Abid
Huawei MRC
Munich, Germany
saad.softwareengineer@gmail.com

Raquel Oliveira
University of Toulouse, IRIT
Toulouse, France
raquel.oliveira@irit.fr

Iulian Ober
University of Toulouse, IRIT
Toulouse, France
iulian.ober@irit.fr

***Abstract* — The 18th edition of the workshop on Model Driven Engineering, Verification and Validation was held October 2021, virtually. The motivation, scope, objectives, and results of the workshop are summarized.**

Keywords* — *model-driven engineering, verification, validation, formal methods, model transformations

I. Introduction

Models are purposeful abstractions of systems and their environments. They can be used to understand, simulate, and validate complex systems at different abstraction levels. Thus, the use of models is of increasing importance for industrial applications. Model-Driven Engineering (MDE) is a development methodology that is based on models, metamodels, and model transformations. The shift from code-centric software development to model-centric software development in MDE opens up promising opportunities for the verification and validation (V&V) of software.

On the other hand, the growing complexity of models and model transformations requires efficient V&V techniques in the context of MDE.

The workshop on Model Driven Engineering, Verification and Validation (MoDeVVa) offers a forum for researchers and practitioners who are working on V&V and MDE. The main goals of the workshop are to identify, investigate, and discuss mutual impacts of MDE and V&V.

For the 2021 edition of the MoDeVVa workshop we would like to encourage papers addressing the use of AI techniques suchas machine learning, to help address the challenges of model-based V&V, while continuing to welcome work in all areas inthe intersection between MDE and V&V.

II. Goals and Objectives of MoDeVVa

The main goals of the workshop are to identify, investigate, and discuss mutual impacts of MDE and V&V. In order to achieve the aforementioned goals, the main objective of the workshop is to bring together researchers and practitioners in the domain of V&V and MDE so that the key issues in the integration of MDE and V&V can be identified and solved.

More concretely, MoDeVVa's main objectives are to address the following:

1. How can V&V tools and techniques be integrated into MDE in such a way that expertise in V&V is not required in order to obtain the benefits that V&V offers?
2. How can MDE be leveraged to facilitate V&V tasks?
3. How can novel approaches such as Machine-Learning be leveraged to facilitate V&V in MDE?
4. How can the combination of MDE and V&V help to address the development of complex real-world systems?

III. List of accepted papers

In this edition of the workshop seven papers were submitted, five of these were accepted (listed below):

1. "Trace-based Timing Analysis of AutomotiveSoftware Systems: an Experience Report". Alessio Bucaioni, Enxhi Ferko and Henrik Lonn.
2. " Multi-layered model-based design approach towards system safety and security co-engineering". Megha Quamara, Gabriel Pedroza and Brahim Hamid.
3. "Towards Facilitating the Exploration of Informal Concepts in Formal Modeling Tools". Martin Gogolla, Robert Clariso, Bran Selic and Jordi Cabot.
4. "Synchronous Execution Semantics for Component & Connector Models". Malte Heithoff, Evgeny Kusmenko and Bernhard Rumpe.
5. "Software performance engineering with performance antipatterns and code-level probabilistic analysis". Ioannis Stefanakos, Simos Gerasimou and Radu Calinescu.

IV. Workshop Chairs

Saad bin Abid is currently working as a researcher at Huawei MRC, Munich and actively invovled in the automotive domain. In the past, he worked as research scientist at fortiss. He was actively involved within an automotive domain and actively participating in a German Federal Ministry (BMBF) RiSE Project. In the past, he led a German aerospace project ASSET-2 on software testing topics (e.g., building and xecuting automated test case generation, virtual testing, and interfacing various testing

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tools for model-based testing). He also worked in scenario-based software testing in the Advanced Driving and Assistance System (ADAS) domain where he used Machine Learning (ML) techniques to identify driving scenarios and later perform automatic test case generation based on the identified scenarios. He has obtained his Ph.D. in the domain of model-based V&V of feature dependency relationships in Software Product Lines (SPLs) from Lero - The Irish Software Engineering Centre (Ireland) in 2014. In the past, he has worked on applying model-based testing for software tools in the telecommunications domain. His interests include Machine Learning (ML) for effective test-case generation, toolchain development enabling automatic test case generation, model-based V&V approaches and model-based requirements engineering.

Raquel Araujo de Oliveira is an assistant professor at the University of Toulouse III - Paul Sabatier (France). Previous to that, she worked as an invited researcher at Queen's University (Canada). She obtained her Ph.D degree in Computer Science in 2015 in Grenoble (France), where she also obtained her Masters in Computer Science, in 2012. She has a solid experience in software development and project management, acquired during 10 years working at different software development companies in Brazil. Her research interest is centered around model-driven engineering, humancomputer interaction, security, and practical application of formal methods to real-world problems.

Iulian Ober is an Associate Professor at the University of Toulouse, France. He obtained a PhD from the Institut National Polytechnique of Toulouse, in 2001. After a postdoc at the Verimag laboratory in Grenoble, he has joined the faculty at the University of Toulouse in 2005, where he is a member of IRIT (Institut de Recherche en Informatique de Toulouse). Between 2013 and 2015 he lead the MACAO team (Models, Architectures, Components, Agility and prOcesses) of IRIT. He is currently co-leading the Aeronautics, Space and Transport Strategic Domain at IRIT. He was a prime investigator in several EU, ESA and French national projects. In this context, he has developed model semantics and analysis techniques that have been successfully used in several industrial-grade projects in the aerospace domain. His research area covers model-driven design, verification and validation of complex software intensive systems and in particular critical cyber-physical systems, using industry standards such UML or SysML.

V. PROGRAM COMMITTEE

- Adina Aniculaesei (Institute for Software and Systems Engineering, TU Clausthal, Germany)
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