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Workshop on the State of the Art Methods and Tools in Model-Based Systems Engineering

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Preface

The notion of model-based systems engineering (MBSE) is an increasingly applied area in both research and industry. It envisions a transition from document-based development of cyber-physical systems (CPSs) to a model-driven approach using models as the primary engineering artifacts. Modern systems become more and more complex and involve an increasing number of different domains. Engineering in this interdisciplinary context is a crucial competitive factor and demands efficient and sustainable CPS development. This cross-domain development requires the communication and agile coordination of experts from different disciplines, who are responsible for individual sub-areas but also must organize their work in the context of the entire system. MBSE tackles these challenges with the vision of seamlessly integrated system modeling, in which experts of various domains contribute to a single source of truth using domain-specific modeling techniques.

Overcoming the challenges in interdisciplinary CPS development is essential for successfully applying MBSE. Collaboration often suffers from insufficient tool support or a lack of semantics for the employed modeling languages. While abstraction, composition, and refinement techniques have already been intensively researched, they still find little application in practice. Domain experts should be methodically guided by the modeling tool to enable consistent and concise development. This goal requires unambiguous semantics of a language to clarify the meaning of a model, even in an interdisciplinary context.

This workshop aims to bring together people involved in model-based systems. In particular, through this workshop, we intended to promote the exchange between industry and research and, by linking theory and practice, exchange knowledge and experience and discuss the application of MBSE methods. Therefore, relevant topics for this workshop were experiences and challenges of applying MBSE tools, methods, and analyses, and efforts to conceive tools and methods to support MBSE.

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For presentation during the workshop, we accepted six papers highlighting different aspects of system modeling. Contributions include the development of tools and methods to support MBSE, as well as experience and evaluation reports on applying these. In addition, we invited Prof. Dr. Andreas Vogelsang to a keynote presentation and two talks from the industry to present their efforts and achievements in applying model-based system engineering methods.

We thank Prof. Dr. Andreas Vogelsang for offering to give a keynote presentation and all authors for the careful elaborations and reprocessing of their results. In addition, we thank the program committee members for reviewing the contributions and providing feedback to the authors. Finally, we thank the organizers of the conference and the workshops for their effort in planning the event.