
The Theory and Practice of Modeling Language Design for Model-Driven Development

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Abstract

Model-driven development (MDD), while far from being a panacea, has demonstrated its effectiveness in alleviating some of the most critical design hurdles that impede the design and development of complex software systems. There are numerous examples of large-scale industrial systems that were developed using MDD techniques and technologies. Unfortunately, although models and modeling have a long tradition in software, there is still no established systematic theoretical framework to support MDD.

This talk focuses on one particularly vital aspect of MDD: the design of modeling languages for MDD. The objective is not only to provide an overview of the current state of the art in modeling language design, but also to identify key open issues and research directions that would lead to a sound theory of modeling-language design comparable to that which already exists for programming languages.

The first part of the talk examines the overall MDD landscape. Next, two widely used modeling language standards are described in somewhat greater detail: the MetaObject Facility (MOF) and the most recent version of the Unified Modeling Language (UML 2). Different approaches to so-called domain-specific modeling language design are covered next. This is followed by a brief survey of model transformation techniques used for automatic code generation as well as model-to-model translations. The talk concludes with a survey of current research trends and challenges.



Bio of Bran Selic

Bran is President of Malina Software Corp., a Canadian company that provides consulting services to corporate clients and government institutions worldwide. He is also Director of Advanced Technology at Zeligsoft Limited in Canada and a Visiting Scientist at Simula Research Laboratories in Norway. In 2007, Bran retired from IBM Canada, where he was an IBM Distinguished Engineer, responsible for setting the strategic

direction for software development tools. In addition, he is an adjunct professor of computer science at the University of Toronto and at Carleton University (Ottawa, Canada), as well as a guest lecturer and researcher at the University of Sydney (Australia) and at INSA (Lyon, France). With close to 40 years of practical experience in designing and implementing large-scale industrial software systems, Bran has pioneered the application of model-based engineering methods in real-time and embedded applications and has led the definition of several international standards in that domain including the widely used Unified Modeling Language (UML).