

Lionel Briand
Clay Williams (Eds.)

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Preface

The MoDELS (Model Driven Engineering, Languages, and Systems) conference is a continuation of the successful series of «UML» conferences. This volume contains the final versions of the technical papers presented at MoDELS 2005 in Montego Bay, Jamaica, October 2–7, 2005.

The «UML» series began in 1988 at Mulhouse, France when the Unified Modeling Language was relatively new. Since then the conferences have been annually, with an increase in both attendance and the breadth of the work presented at the conferences. The appearance of new research areas and topics in prior conferences was the motivation for renaming the conference to reflect the broader mission the conferences were enabling. Among the new areas taking their place alongside UML and related standards, such as Model Driven Architecture (MDA), are model refactoring, aspect oriented modeling, and model quality control.

The call for papers for MoDELS 2005 resulted in the submission of 215 abstracts and 166 papers. Each submission was reviewed by at least 3 referees assigned from the set of 51 Program Committee members. After several rounds of discussion within the Program Committee, 46 papers (40 scientific papers and 6 experience papers) were selected for publication. The Program Committee also selected a paper for the Best Paper MoDELS 2005 Award. The paper is by Friedrich Steimann and is titled “Domain Models are Aspect Free.”

The review process was managed using the VirtualChair reviewing system, developed by Vahid Garousi at Carleton University, Ottawa, Canada.

In addition to the presentations of the papers, the MoDELS 2005 scientific program included 2 keynote talks, “Model Driven Development for Distributed Real-Time and Embedded Systems”, given by Douglas C. Schmidt (Vanderbilt University), and “Domain-Specific Modeling: No One Size Fits All” by Juha-Pekka Tolvanen (MetaCase). The conference also included 10 workshops, 6 tutorials, a Doctoral Symposium, an Educators Symposium, and a Poster/Demo Session.

We would like to thank all of the people who submitted papers and proposals for workshops and tutorials, as well as the excellent Program Committee members who reviewed these submissions. We also thank the invited speakers, the other members of the conference committees, the individuals who helped with the website and publicity, and the members of the Local Organizing Committee who helped make the conference run smoothly and made the local arrangements. Finally, we thank the sponsors for their generous support of MoDELS 2005.

Lionel Briand, Geri Georg, Stuart Kent, Ezra Mugisa, Clay Williams

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Keynote Address I: Model Driven Development for Distributed Real-Time and Embedded Systems

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Abstract

Despite advances in standards-based commercial-off-the-shelf (COTS) technologies, key challenges must be addressed before COTS software can be used to build mission-critical DRE systems effectively and productively. For example, developers of DRE systems continue to use ad hoc means to develop, configure, and deploy their applications and middleware due to the lack of formally analyzable and verifiable building block components.

This talk will describe how Model Driven Development (MDD) techniques and tools can be used to specify, analyze, optimize, synthesize, validate, and deploy product-line architectures (PLAs) and standards-compliant middleware platforms that can be customized for the needs of next-generation DRE systems. MDD is an emerging paradigm that combines:

- Domain-specific modeling languages (DSMLs), which provide programming notations that formalize the process of specifying application logic and quality of service (QoS)-related requirements in a PLA.
- Metamodeling, which define type systems that precisely express key characteristics and constraints associated with DSMLs for PLAs in particular application domains, such as software defined radios, avionics, vehtronics, and process automation.
- Model transformations and synthesis techniques that automate and ensure the consistency of software implementations with analysis information associated with functional and QoS requirements captured by models of PLA structure and behavior.

This talk will compare and contrast various model-based approaches (e.g., MIC, MDD, MDA, etc) to developing PLA-based DRE systems. It will also illustrate how MDD techniques and tools have been successfully integrated with standards-based QoS-enabled component middleware to develop PLAs that significantly improve the quality and productivity associated with developing next-generation mission-critical DRE systems. Concrete examples from avionics, process control, software defined radios, and warehouse management systems will be used to illustrate key points.