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Formal Methods for Components and Objects

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Revised Lectures

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Preface

Large and complex software systems provide the necessary infrastructure in all industries today. In order to construct such large systems in a systematic manner, the focus in development methodologies has switched in the last two decades from functional issues to structural issues: both data and functions are encapsulated into software units which are integrated into large systems by means of various techniques supporting reusability and modifiability. This encapsulation principle is essential to both the object-oriented and the more recent component-based software engineering paradigms.

Formal methods have been applied successfully to the verification of medium-sized programs in protocol and hardware design. However, their application to the development of large systems requires more emphasis on specification, modeling and validation techniques supporting the concepts of reusability and modifiability, and their implementation in new extensions of existing programming languages like Java.

The 7th Symposium on Formal Methods for Components and Objects was held in Sophia Antipolis, France, during October 21–23, 2008. It was realized as a concertation meeting of European projects focussing on formal methods for components and objects. This volume contains the contributions submitted after the symposium by the speakers of each of the following European IST projects involved in the organization of the program:

- The IST-FP7 project COMPAS on compliance-driven models, languages, and architectures for services. The contact person is Schahram Dustdar (Technical University of Vienna, Austria)
- The IST-FP6 project CREDO on modelling and analysis of evolutionary structures for distributed services. The contact person is Frank de Boer (CWI, The Netherlands).
- The IST-FP7 DEPLOY on industrial deployment of advanced system engineering methods for high productivity and dependability. The contact person is Alexander Romanovsky (Newcastle University, UK).
- The IST-FP6 project GridComp on grid programming with components. The contact person is Denis Caromel (INRIA Sophia-Antipolis, France).
- The IST-FP6 project MOBIUS aiming at developing the technology for establishing trust and security for the next generation of global computers, using the proof carrying code paradigm. The contact person is Gilles Barthe (IMDEA Software, Spain).

The proceedings of the previous editions of FMCO have been published as volumes 2852, 3188, 3657, 4111, 4709 and 5382 of Springer's *Lecture Notes in Computer Science*. We believe that these proceedings provide a unique combination of ideas on software engineering and formal methods which reflect the expanding body of knowledge on modern software systems.

Finally, we thank all authors for the high quality of their contributions, and the reviewers for their help in improving the papers for this volume.

June 2009

Frank de Boer
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Eric Madelaine

Organization

FMCO 2008 was part of the 5th Grids@Work event, co-organized by ERCIM, ETSI, INRIA, I3S, and CNRS. The 5th Grids@Work event was composed of:

The 5th Grid Plugtest, including the *Grids for Finance and Telecommunication Contest*
The GridCOMP conference
The FMCO symposium
The European technical concertation meeting *From Components to Services to Utilities* by the European units D3, *Software, Service Architectures and Infrastructures*, and F3, *eInfrastructures*
ProActive and GCM user groups and tutorials

The FMCO symposia are organized in the context of the project Mobi-J, a project founded by a bilateral research program of The Dutch Organization for Scientific Research (NWO) and the Central Public Funding Organization for Academic Research in Germany (DFG). The partners of the Mobi-J projects are: the Centrum voor Wiskunde en Informatica, the Leiden Institute of Advanced Computer Science, and the Christian-Albrechts-Universität Kiel.

This project aims at the development of a programming environment which supports component-based design and verification of Java programs annotated with assertions. The overall approach is based on an extension of the Java language with a notion of component that provides for the encapsulation of its internal processing of data and composition in a network by means of mobile asynchronous channels.

Sponsoring Institutions

The Dutch Organization for Scientific Research (NWO)

L'Institut National de Recherche en Informatique et Automatique (INRIA)

Le Laboratoire d'Informatique, Signaux et Systèmes de Sophia-Antipolis (I3S, Université de Nice Sophia-Antipolis et CNRS)

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