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Formal Methods for Components and Objects

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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 6th Symposium on Formal Methods for Components and Objects was held in Amsterdam, The Netherlands, during October 24–26, 2007. 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 jointly with the bilateral NWO/DFG project MobiJ:

- 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 persons are Martin Hofmann (Ludwig Maximilians University Munich, Germany) and Gilles Barthe (IMDEA Software, Spain).
- The IST-FP6 project SelfMan on self-management for large-scale distributed systems based on structured overlay networks and components. The contact person is Peter Van Roy (Université Catholique de Louvain, Belgium).
- The IST-FP6 project GridComp and the FP6 CoreGRID Network of Excellence on grid programming with components. The contact person is Denis Caromel (INRIA Sophia-Antipolis, France).
- The Real-time component cluster of the Network of Excellence on Embedded System Design ARTIST. This cluster focuses on design processes and architectures for real-time embedded systems. The contact person is Albert Benveniste (INRIA / IRISA, France)
- 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 proceedings of the previous editions of FMCO have been published as volumes 2852, 3188, 3657, 4111, and 4709 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.

September 2008

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Organization

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)
The Dutch Institute for Programming research and Algorithmics (IPA)
The Centrum voor Wiskunde en Informatica (CWI), The Netherlands
The Leiden Institute of Advanced Computer Science (LIACS), The Netherlands

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