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Hans-Jörg Kreowski
Ugo Montanari
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Formal Methods in Software and Systems Modeling

Essays Dedicated to Hartmut Ehrig on the Occasion of His 60th Birthday

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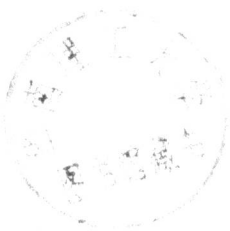

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Preface

This Festschrift is dedicated to Hartmut Ehrig on the occasion of his 60th birthday on December 6, 2004. The contributions discuss various aspects of the formal and visual modeling of software and systems. The authors are some of Hartmut Ehrig's former students and collaborators who are established researchers in their fields. All essays were invited, but they nevertheless went through a reviewing process.

Hartmut Ehrig is a leading, very enthusiastic and highly inspiring scientist who has made lasting contributions to the theoretical foundations of software and system modeling and in particular to graph transformation, algebraic specification and net theory. For more than 30 years his name has been associated with the double-pushout approach, which is the most frequently used and most successful framework in graph transformation. For nearly as long, his work on structuring, parameterization, refinement, and modularization of algebraic specifications has helped to develop this area in an important and sustainable way. Also net theory owes him a very powerful notion and a fundamental study of high-level nets. While Hartmut Ehrig is a category theorist and has advocated the use of category theory in most of his research, he has also undertaken many successful efforts to cooperate with researchers in applied areas such as database systems, software engineering, and even mechanical engineering.

The essays in this book are divided into three parts, each consisting of eight papers: graph transformation, algebraic specification and logic, and formal and visual modeling. Five papers from the first part concern syntactic and semantic aspects of graph transformation (concurrent semantics, interconnection of graph transformation modules, graph processes, graph transformation with variables, and changing labels in the double-pushout approach). The other three papers relate graph transformation with net theory, software engineering, and molecular biology. The papers from the second part address a wide spectrum of topics ranging from data types, coalgebras and interfaces, through functorial semantics of rewrite theories and interactive formal reasoning, to the integration of logics and schema theory. Moreover, one paper relates conditional specifications and interaction charts. The third part contains all further contributions concerning formal and visual modeling including four papers on statechart models, link graphs, architectural connectors for UML, and concurrent object-based systems. Two papers deal with Petri nets considering them as a foundation for a system theory for transportation on the one hand and providing them with a loose semantics on the other hand. And the other two papers in this part discuss nested constraints for high-level systems and transformation units with interlinking semantics.

We felt privileged to be able to edit this volume for Hartmut, expressing in this way our admiration for his scientific work and our thanks for his friendship and collaboration. We would like to express our gratitude to all contributors to

this volume. We are also indebted to the referees and in particular to Roberto Bruni and Horst Reichel, who served as reviewers without being authors. We are grateful to Peter Knirsch for his support in editing the book and careful unification of all the print files. Very special thanks go to DADARA, who provided the beautiful cover illustration. Finally, we would like to acknowledge the excellent cooperation with Springer, the publisher of this Festschrift.

Dezember 2004

Hans-Jörg Kreowski
Ugo Montanari
Fernando Orejas
Grzegorz Rozenberg
Gabriele Taentzer

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