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Preface

The rule-based programming paradigm is characterized by the repeated, localized transformation of a shared data object such as a term, graph, proof, or constraint store. The transformations are described by rules which separate the description of the pattern to be replaced from the calculation of the replacement. Optionally, rules can have further conditions that restrict their applicability. Also, the transformations are controlled by explicit or implicit strategies. These basic concepts of rule-based programming appear throughout computer science, from theoretical foundations to practical implementations.

Rule-based programming is currently experiencing a renewed period of growth with the emergence of new concepts and systems that allow better understanding and better usability. On the theoretical side, after the in-depth study of rewriting concepts during the eighties, the nineties saw the emergence of the general concepts of rewriting logic and of the rewriting calculus. On the practical side, new languages and systems such as ASF+SDF, BURG, CHRS, Claire, ELAN, Maude, Stratego, and TOM have shown that rules are a useful programming tool.

The practical application of rule-based programming prompts research into the algorithmic complexity and optimization of rule-based programs as well as into the expressivity, semantics and implementation of rule-based languages.

This volume contains the final versions of the papers that were presented at the *Sixth International Workshop on Rule-Based Programming* (RULE 2005) that was held in Nara, Japan, on April 23, 2005, as part of the *Federated Conference on Rewriting, Deduction, and Programming* (RDP 2005).

Previous editions of the RULE workshop were held in Aachen, Germany (2004) and Valencia, Spain (2003) during the RDP conference *Rewriting, Deduction and Programming*, and Pittsburg, USA (2002), Firenze, Italy (2001), and Montreal, Canada (2000) during the PLI conference *Principles, Log-*

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ics, and Implementations of high-level programming languages. More details about these workshops can be found at `http://rewriting.loria.fr` (item "Venues")

The topics of the workshop comprise, but are not limited to,

- languages for rule-based programming, including their expressivity, semantics, and implementation techniques;
- applications of rule-based programming, including analysis of rule-based programs and programming methods;
- environments for rule-based programming, including (partial) evaluation as well as abstract machines for rewriting;
- combination of rule-based programming with other paradigms; and
- system descriptions.

Thirteen papers were submitted, covering most of the topics above. Out of them the program committee selected six to be included in the workshop program, after a reviewing process in which every paper was thoroughly evaluated by at least three referees. The workshop program also included an invited talk by Mitsuhiro Okada.

Even a one-day workshop like RULE requires the effort of many people to make it happen, including all the authors who submitted papers and showed interest in the subject, as well as the members of the program committee and the external referees appointed by them, who worked hard to satisfactorily complete the reviewing process on time; we are most grateful to all of them.

The program committee consisted of Mark van den Brand, Horatiu Cirstea, Steven Eker, Maribel Fernandez, Kokichi Futatsugi, Jean-Louis Giavitto, Christian Holzbaur, Salvador Lucas, Narciso Martí-Oliet, Ugo Montanari, Eelco Visser, and Gerd Wagner, and the following external referees participated in the reviewing process: Noriki Amano, Clara Bertolissi, Stefano Bistarelli, Manuel Clavel, Santiago Escobar, Germain Faure, Giorgio Ghelli, Adrian Giurca, Stefania Gnesi, Barbara Koenig, Masaki Nakamura, Kazuhiro Ogata, Miguel Palomino, Takahiro Seino, Alberto Verdejo, Maria Grazia Vigliotti, Jurgen Vinju, Benjamin Wack.

We also would like to thank the RDP organizers, in particular Hitoshi Ohsaki, for taking care of all the local arrangements and accommodating our special requests; Mike Mislove, managing editor of the ENTCS series, for providing us the opportunity to publish in this series and his assistance; and Andrei Voronkov, for creating the EasyChair conference system, making it available for free, and supporting it. The advice provided by our colleagues Manuel Clavel, Pierre-Etienne Moreau, Christophe Ringeissen, and Alberto Verdejo has been very helpful. Finally, we are also grateful to our

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