Lecture Notes in Artificial Intelligence 5437

Edited by R. Goebel, J. Siekmann, and W. Wahlster

Subseries of Lecture Notes in Computer Science

Dietmar Seipel   Michael Hanus
Armin Wolf (Eds.)

Applications of Declarative Programming and Knowledge Management

17th International Conference, INAP 2007
and 21st Workshop on Logic Programming, WLP 2007
Würzburg, Germany, October 4-6, 2007
Revised Selected Papers

Springer

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Volume Editors

Dietmar Seipel
Universität Würzburg
Institut für Informatik
Am Hubland, 97074 Würzburg, Germany
E-mail: seipel@informatik.uni-wuerzburg.de

Michael Hanus
Christian-Albrechts-Universität zu Kiel
Institut für Informatik
Christian-Albrechts-Platz 4, 24118 Kiel, Germany
E-mail: mh@informatik.uni-kiel.de

Armin Wolf
Fraunhofer FIRST
Kekuléstr. 7, 12489 Berlin, Germany
E-mail: Armin.Wolf@first.fraunhofer.de

Preface

This volume contains a selection of papers presented at the 17th International Conference on Applications of Declarative Programming and Knowledge Management INAP 2007 and the 21st Workshop on Logic Programming WLP 2007, which were held jointly in Würzburg, Germany, during October 4–6, 2007.

Declarative programming is an advanced paradigm for the modeling and solving of complex problems. This specification method has become more and more attractive over the last years, e.g., in the domains of databases, for the processing of natural language, for the modeling and processing of combinatorial problems, and for establishing knowledge–based systems for the Web.

The INAP conferences provide a forum for intensive discussions of applications of important technologies around logic programming, constraint problem solving, and closely related advanced software. They comprehensively cover the impact of programmable logic solvers in the Internet society, its underlying technologies, and leading-edge applications in industry, commerce, government, and societal services.

The Workshops on Logic Programming are the annual meeting of the Society for Logic Programming (GLP e.V.). They bring together researchers interested in logic programming, constraint programming, and related areas like databases and artificial intelligence. Previous workshops have been held in Germany, Austria and Switzerland.

The topics of the selected papers of this year's joint conference concentrated on three currently important fields: constraint programming and constraint solving, databases and data mining, and declarative programming with logic languages.

During the last couple of years a lot of research has been conducted on the usage of declarative programming for *databases and data mining*. Reasoning about knowledge wrapped in rules, databases, or the Web allows one to explore interesting hidden knowledge. Declarative techniques for the transformation, deduction, induction, visualization, or querying of knowledge, or data mining techniques for exploring knowledge have the advantage of high transparency and better maintainability compared to procedural approaches.

The problem when using knowledge to find solutions for large industrial tasks is that these problems have an exponential complexity, which normally prohibits the fast generation of exact solutions. One method which has made substantial progress over the last years is the *constraint programming* paradigm. The declarative nature of this paradigm offers significant advantages for software engineering both in the implementation and in the maintenance phase. Different interestings aspects are under discussion: how can this paradigm be improved or combined with known, classical methods; how can practical problems be modeled as con-

straint problems; and what are the experiences of applications in really large industrial planning and simulation tasks?

Another area of active research is the *extension* of the *logic programming paradigm* and its integration with other programming concepts. The successful extension of logic programming with constraints has been already mentioned. Other extensions intend to increase the expressivity of logic languages by including new logical constructs, such as contextual operators or temporal annotations. The integration of logic programming with other programming paradigms has been mainly investigated for the case of functional programming. This combination is beneficial from a software engineering point of view: well–known functional programming techniques to improve the structure and quality of the developed software, e.g., types, modules, higher–order operators, or lazy evaluation, can be also used for logic programming in an integrated language.

The two conferences INAP 2007 and WLP 2007 were jointly organized at the University of Würzburg, Germany, by the following institutions: the University of Würzburg, the Society for Logic Programming (GLP e.V.), and the Fraunhofer Institute for Computer Architecture and Software Technology (FhG First). We would like to thank all authors who submitted papers and all conference participants for the fruitful discussions. We are grateful to the members of the Program Committee and the external referees for their timely expertise in carefully reviewing the papers, and we would like to express our thanks to the Institute for Bioinformatics of the University of Würzburg for hosting the conference.

September 2008   Dietmar Seipel
                                                                 Michael Hanus
                                                                    Armin Wolf

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