

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Alfred Kobsa

University of California, Irvine, CA, USA

Friedemann Mattern

ETH Zurich, Switzerland

John C. Mitchell

Stanford University, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz

University of Bern, Switzerland

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

University of Dortmund, Germany

Madhu Sudan

Massachusetts Institute of Technology, MA, USA

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Gerhard Weikum

Max-Planck Institute of Computer Science, Saarbruecken, Germany

Klaus-Dieter Schewe Bernhard Thalheim (Eds.)

Semantics in Data and Knowledge Bases

Third International Workshop, SDKB 2008
Nantes, France, March 29, 2008
Revised Selected Papers

Volume Editors

Klaus-Dieter Schewe
Information Science Research Centre
20A Manapouri Cr, Palmerston North 4410, New Zealand
E-mail: kdschewe@acm.org

Bernhard Thalheim
Christian-Albrechts-University of Kiel
Institute of Computer Science and Applied Mathematics
Olshausenstr. 40, 24098 Kiel, Germany
E-mail: thalheim@is.informatik.uni-kiel.de

Library of Congress Control Number: 2008938654

CR Subject Classification (1998): H.2, H.4, H.3, C.2.4, F.4.1

LNCS Sublibrary: SL 3 – Information Systems and Application, incl.
Internet/Web and HCI

ISSN	0302-9743
ISBN-10	3-540-88593-5 Springer Berlin Heidelberg New York
ISBN-13	978-3-540-88593-1 Springer Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

Springer is a part of Springer Science+Business Media

springer.com

© Springer-Verlag Berlin Heidelberg 2008
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 12549405 06/3180 5 4 3 2 1 0

Preface

This volume comprises selected papers of the Third International Workshop on Semantics in Data and Knowledge Bases, which was collocated with EDBT 2008 and was organized in Nantes on March 29, 2008. The first two workshops “Semantics in Databases” took place in Rež, Czech Republic in 1995 and Dagstuhl, Germany, 2001. The workshops have had post-proceedings of selected papers given at the workshop. We invited the best papers of the workshop to submit a revised version of their paper. These revisions have been reviewed for the final proceedings. The proceedings of the first two workshops were published by Springer in the LNCS series, volumes 1358 and 2582. The SDKB 2008 workshop call for papers led to 19 submissions, which were reviewed by 4 reviewers.

We selected six of the papers given at the SDKB 2008 workshop. We additionally invited four papers that round up the proceedings. Furthermore, we added a survey on the state of the art in the field.

The SDKB workshop series tries to bring together researchers in the areas of data and knowledge bases who work on aspects of semantics. In particular, the workshop presents original contributions demonstrating the use of logic, discrete mathematics, combinatorics, domain theory and other mathematical theories of semantics for database and knowledge bases, computational linguistics and semiotics, and information and knowledge-based systems.

Topics of research papers are concentrated around the following research topics:

- Formal models for data and knowledge bases
- Integrity constraints maintenance and dependency theory
- Formal methods for data and knowledge base design
- Reasoning about data and knowledge base dynamics
- Adaptivity for personalized data and knowledge bases
- View-centered data- and knowledge-intensive systems
- Information integration in data and knowledge bases
- Knowledge discovery in data and knowledge bases
- Validation and verification of data and knowledge base designs
- Formal linguistics for data and knowledge bases
- Logical and mathematical foundations of semantics
- Semantics in data- and knowledge-intensive applications

We want to thank the members of our Program Committee for their detailed reviews and for the support in the second round of reviewing revised papers. We are thankful to the EDBT organizers for the environment and the organization

of the workshop. Our thanks go especially to Laurent Amsaleg, Elisabeth Lebet, Markus Kirchberg, and René Noack for their support of the organization.

July 2008

Klaus-Dieter Schewe
Bernhard Thalheim

Organization

Program Co-chairs

Klaus-Dieter Schewe	Information Science Research Centre, New Zealand
Bernhard Thalheim	Christian Albrechts University of Kiel, Germany

Program Committee

Catriel Beeri	Israel
Stefan Brass	Germany
Andrea Cali	Italy
Lois Delcambre	USA
Thomas Eiter	Austria
Guido Governatori	Australia
Marc Gyssens	Belgium
Roland Hausser	Germany
Stephen Hegner	Sweden
Gabriele Kern-Isberner	Germany
Markus Kirchberg	Singapore
Nicola Leone	Italy
Mark Levene	UK
Sebastian Link	New Zealand
Hui Ma	New Zealand
Wai Yin Mok	USA
Wilfred Ng	Hong Kong
Peter Revesz	USA
Attila Sali	Hungary
Dietmar Seipel	Germany
Leticia Tanca	Italy
Rodney Topor	Australia
Riccardo Torlone	Italy

Additional Reviewers

E. Asarin	D. Beauquier	P. Caspi
-----------	--------------	----------

Organization Committee

Wolf Zimmermann	Martin Luther University Halle-Wittenberg
Rene Noack	Martin Luther University Halle-Wittenberg
Michael Schaarschmidt	Martin Luther University Halle-Wittenberg
Thomas Kobienia	Cottbus University of Technology

Sponsoring Institutions of SDKB 2008

Martin Luther University Halle-Wittenberg, Germany

Microsoft Research, Redmond, WA, USA

Stiftung Leucorea, Germany

Winzervereinigung Freyburg-Unstrut eG, Germany

Table of Contents

Introduction

Semantics in Data and Knowledge Bases	1
<i>Klaus-Dieter Schewe and Bernhard Thalheim</i>	

Invited Papers

Data Integration through $DL\text{-}Lite_A$ Ontologies	26
<i>Diego Calvanese, Giuseppe De Giacomo, Domenico Lembo, Maurizio Lenzerini, Antonella Poggi, Riccardo Rosati, and Marco Ruzzi</i>	
The Relational Polynomial-Time Hierarchy and Second-Order Logic	48
<i>Flavio A. Ferrarotti and José M. Turull Torres</i>	
Qualitative Knowledge Discovery	77
<i>Gabriele Kern-Isberner, Matthias Thimm, and Marc Finthammer</i>	
On the Notion of an XML Key	103
<i>Sven Hartmann, Henning Köhler, Sebastian Link, Thu Trinh, and Jing Wang</i>	

Research Papers

Embodied Context Semantics	113
<i>Ander Altuna</i>	
Definition and Formalization of Entity Resolution Functions for Everyday Information Integration	126
<i>David W. Archer and Lois M.L. Delcambre</i>	
A Theoretical Framework for the Declarative Debugging of Datalog Programs	143
<i>R. Caballero, Y. García-Ruiz, and F. Sáenz-Pérez</i>	
Semantic Bijectivity and the Uniqueness of Constant-Complement Updates in the Relational Context	160
<i>Stephen J. Hegner</i>	
A Top-Down Approach to Rewriting Conjunctive Queries Using Views	180
<i>Nima Mohajerin and Nematollaah Shiri</i>	

Rewriting Conjunctive Queries over Description Logic Knowledge
Bases 199
 Héctor Pérez-Urbina, Boris Motik, and Ian Horrocks

Author Index 215