

Lecture Notes in Artificial Intelligence 4068

Edited by J. G. Carbonell and J. Siekmann

Subseries of Lecture Notes in Computer Science

Henrik Schärfe Pascal Hitzler
Peter Øhrstrøm (Eds.)

Conceptual Structures: Inspiration and Application

14th International Conference
on Conceptual Structures, ICCS 2006
Aalborg, Denmark, July 16-21, 2006
Proceedings

Series Editors

Jaime G. Carbonell, Carnegie Mellon University, Pittsburgh, PA, USA
Jörg Siekmann, University of Saarland, Saarbrücken, Germany

Volume Editors

Henrik Schärfe
Peter Øhrstrøm
Aalborg University, Department of Communication
Kroghstraede 3, 9220 Aalborg East, Denmark
E-mail: {scharfe, poe}@hum.aau.dk

Pascal Hitzler
University of Karlsruhe, Institute AIFB
76128 Karlsruhe, Germany
E-mail: hitzler@aifb.uni-karlsruhe.de

Library of Congress Control Number: 2006928040

CR Subject Classification (1998): I.2, G.2.2, F.4.1, F.2.1, H.4

LNCS Sublibrary: SL 7 – Artificial Intelligence

ISSN	0302-9743
ISBN-10	3-540-35893-5 Springer Berlin Heidelberg New York
ISBN-13	978-3-540-35893-0 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 2006
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 11787181 06/3142 5 4 3 2 1 0

Preface

The 14th International Conference on Conceptual Structures (ICCS 2006) was held in Aalborg, Denmark during July 16 – 21, 2006.

Responding to the Call for Papers, we received 62 papers from 20 different countries, representing six different continents. This clearly indicates the international nature of the ICCS community as well as the widespread interest which was spawned by the previous conferences. By a thorough review process, 24 papers were selected to be included in this volume. In addition, six invited speakers made contributions which can be found in the first section of this volume.

The theme of ICCS 2006—Conceptual Structures: Inspiration and Application—points to a dual focus of interest that is also reflected in the constellation of papers. From the beginning of the planning of this conference, we focused on inspirational sources that have led to the current state of research in our community, by tracing important historical influences which daily effect work in representing knowledge and in handling representations of conceptual structures. At the same time, we also focused on ways in which these legacies are employed to further advance theory and practice in the field of knowledge representation and processing. With this volume, we believe that a valuable contribution to both aspects of this field is being made.

We wish to express our appreciation to all the authors of submitted papers, to the members of the Editorial Board and the Program Committee for all their work and valuable comments.

More information regarding the details of the conference can be found on the conference homepage at <http://iccs-06.hum.aau.dk>.

July 2006

Henrik Schärfe
Pascal Hitzler
Peter Øhrstrøm

Organization

The International Conference on Conceptual Structures is the annual conference and principal research forum in the theory and practice of conceptual structures. Previous ICCS conferences were held at the Université Laval (Quebec City, 1993), at the University of Maryland (1994), at the University of California (Santa Cruz, 1995), in Sidney, 1996), at the University of Washington (Seattle, 1997), in Montpellier (1998), at Virginia Tech (Blacksburg, 1999), at Darmstadt University of Technology (2000), at Stanford University (2001), at Borovets, Bulgaria (2002), at Dresden University of Technology (2003), at the University of Alabama (Huntsville, 2004), and at the University of Kassel (2005).

General Chair

Peter Øhrstrøm Aalborg University, Denmark

Program Chairs

Henrik Schärfe Aalborg University, Denmark
Pascal Hitzler University of Karlsruhe, Germany

Editorial Board

Galia Angelova (Bulgaria)
Michel Chein (France)
Frithjof Dau (Germany)
Aldo de Moor (Belgium)
Harry Delugach (USA)
Peter Eklund (Australia)
Bernhard Ganter (Germany)
Mary Keeler (USA)
Sergei Kuznetsov (Russia)
Wilfried Lex (Germany)

Guy Mineau (Canada)
Bernard Moulin (Canada)
Marie-Laure Mugnier (France)
Peter Øhrstrøm (Denmark)
Heather Pfeiffer (USA)
Uta Priss (UK)
John Sowa (USA)
Gerd Stumme (Germany)
Rudolf Wille (Germany)
Karl Erich Wolff (Germany)

Program Committee

Radim Bělohlávek (Czech Republic)
Anne Berry (France)
Tru Cao (Vietnam)
Dan Corbett (Australia)
Pavlin Dobrev (Bulgaria)
David Genest (France)
Ollivier Haemmerlé (France)
Udo Hebisch (Germany)
Joachim Hereth Correia (Germany)
Richard Hill (UK)
Andreas Hotho (Germany)
Christian Jacquelinet (France)
Adil Kabbaj (Marocco)
Pavel Kocura (UK)
Yannis Kalfoglou (UK)
Robert Kremer (Canada)
Markus Krötzsch (Germany)
Leonhard Kwuida (Switzerland)
Michel Leclère (France)

Robert Levinson (USA)
Michel Liquière (France)
Carsten Lutz (Germany)
Philippe Martin (Australia)
Claudio Masolo (Italy)
Engelbert Mephu Nguifo (France)
Jørgen Fischer Nilsson (Denmark)
Sergei Obiedkov (South Africa)
Ulrik Petersen (Denmark)
Simon Polovina (UK)
Anne-Marie Rassinoux (Switzerland)
Gary Richmond (USA)
Olivier Ridoux (France)
Sebastian Rudolph (Germany)
Éric Salvat (France)
Janos Sarbo (The Netherlands)
William Tepfenhart (USA)
Guo-Qiang Zhang (USA)

Table of Contents

Invited Papers

Formal Ontology, Knowledge Representation and Conceptual Modelling: Old Inspirations, Still Unsolved Problems (Abstract)	
<i>Nicola Guarino</i>	1
The Persuasive Expansion - Rhetoric, Information Architecture, and Conceptual Structure	
<i>Per F.V. Hasle</i>	2
Revision Forever!	
<i>Benedikt Löwe</i>	22
Ontological Constitutions for Classes and Properties	
<i>Jørgen Fischer Nilsson</i>	37
Peirce's Contributions to the 21 st Century	
<i>John Sowa</i>	54
Two Iconicity Notions in Peirce's Diagrammatology	
<i>Frederik Stjernfelt</i>	70

Contributed Papers

Simple Conceptual Graphs and Simple Concept Graphs	
<i>J.P. Aubert, J.-F. Baget, M. Chein</i>	87
Rules Dependencies in Backward Chaining of Conceptual Graphs Rules	
<i>Jean-François Baget, Éric Salvat</i>	102
Thresholds and Shifted Attributes in Formal Concept Analysis of Data with Fuzzy Attributes	
<i>Radim Bělohlávek, Jan Outrata, Vilém Vychodil</i>	117
Formal Concept Analysis with Constraints by Closure Operators	
<i>Radim Bělohlávek, Vilém Vychodil</i>	131
Mining a New Fault-Tolerant Pattern Type as an Alternative to Formal Concept Discovery	
<i>Jérémy Besson, Céline Robardet, Jean-François Boulicaut</i>	144

The MIEL++ Architecture When RDB, CGs and XML Meet for the Sake of Risk Assessment in Food Products <i>Patrice Buche, Juliette Dibia-Barthélemy, Ollivier Haemmerlé, Rallou Thomopoulos</i>	158
Some Notes on Proofs with Alpha Graphs <i>Frithjof Dau</i>	172
DOGMA-MESS: A Meaning Evolution Support System for Interorganizational Ontology Engineering <i>Aldo de Moor, Pieter De Leenheer, Robert Meersman</i>	189
FCA-Based Browsing and Searching of a Collection of Images <i>Jon Ducrou, Björn Vormbrock, Peter Eklund</i>	203
Semantology: Basic Methods for Knowledge Representations <i>Petra Gehring, Rudolf Wille</i>	215
The Teridentity and Peircean Algebraic Logic <i>Joachim Hereth Correia, Reinhard Pöschel</i>	229
Transaction Agent Modelling: From Experts to Concepts to Multi-Agent Systems <i>Richard Hill, Simon Polovina, Dharmendra Shadija</i>	247
Querying Formal Contexts with Answer Set Programs <i>Pascal Hitzler, Markus Krötzsch</i>	260
Towards an Epistemic Logic of Concepts <i>Tanja Hötte, Thomas Müller</i>	274
Development of Intelligent Systems and Multi-Agents Systems with Amine Platform <i>Adil Kabbaj</i>	286
Ontologies in Amine Platform: Structures and Processes <i>Adil Kabbaj, Karim Bouzouba, Khalid El Hachimi, Nabil Ourdani</i>	300
Building a Pragmatic Methodology for KR Tool Research and Development <i>Mary A. Keeler, Heather D. Pfeiffer</i>	314
Simple Conceptual Graphs with Atomic Negation and Difference <i>Michel Leclère, Marie-Laure Mugnier</i>	331

A Pattern-Based Approach to Conceptual Clustering in FOL <i>Francesca A. Lisi</i>	346
Karl Popper's Critical Rationalism in Agile Software Development <i>Mandy Northover, Andrew Boake, Derrick G. Kourie</i>	360
On Lattices in Access Control Models <i>Sergei Obiedkov, Derrick G. Kourie, J.H.P. Eloff</i>	374
An Application of Relation Algebra to Lexical Databases <i>Uta Priss, L. John Old</i>	388
A Framework for Analyzing and Testing Requirements with Actors in Conceptual Graphs <i>B.J. Smith, Harry Delugach</i>	401
Query-Based Multicontexts for Knowledge Base Browsing: An Evaluation <i>Julien Tane, Philipp Cimiano, Pascal Hitzler</i>	413
Representation and Reasoning on Role-Based Access Control Policies with Conceptual Graphs <i>Romuald Thion, Stéphane Coulondre</i>	427
Representing Wholes by Structure <i>Yang Yu, Ji Wang, Ting Wang, Huowang Chen</i>	441
Author Index	455