

Lecture Notes in Artificial Intelligence 3596

Edited by J. G. Carbonell and J. Siekmann

Subseries of Lecture Notes in Computer Science

Frithjof Dau Marie-Laure Mugnier
Gerd Stumme (Eds.)

Conceptual Structures: Common Semantics for Sharing Knowledge

13th International Conference
on Conceptual Structures, ICCS 2005
Kassel, Germany, July 17-22, 2005
Proceedings

Series Editors

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

Volume Editors

Frithjof Dau

Technische Universität Darmstadt, Fachbereich Mathematik, AG 1
Schloßgartenstr. 7, 64289 Darmstadt, Germany
E-mail: dau@mathematik.tu-darmstadt.de

Marie-Laure Mugnier

LIRMM (CNRS and University of Montpellier II)
161, rue ADA, 34392 Montpellier, France
E-mail: mugnier@lirmm.fr

Gerd Stumme

Universität Kassel, Fachbereich Mathematik und Informatik
Wilhelmshöher Allee 73, 34121 Kassel, Germany
E-mail: stumme@cs.uni-kassel.de

Library of Congress Control Number: 2005928703

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

ISSN 0302-9743
ISBN-10 3-540-27783-8 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-27783-5 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

springeronline.com

© Springer-Verlag Berlin Heidelberg 2005
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Boller Mediendesign
Printed on acid-free paper SPIN: 11524564 06/3142 5 4 3 2 1 0

Preface

The 13th International Conference on Conceptual Structures (ICCS 2005) was held in Kassel, Germany, during July 17–22, 2005. Information about the conference can be found at <http://www.kde.cs.uni-kassel.de/conf/iccs05>.

The title of this year's conference, "Common Semantics for Sharing Knowledge", was chosen to emphasize on the one hand the overall aim of any knowledge representation formalism, to support the sharing of knowledge, and on the other hand the importance of a common semantics to avoid distortion of the meaning. We understand that both aspects are of equal importance for a successful future of the research area of conceptual structures. We are thus happy that the papers presented at ICCS 2005 addressed both applications and theoretical foundations.

"Sharing knowledge" can also be understood in a separate sense. Thanks to the German Research Foundation, DFG, we were able to invite nine internationally renowned researchers from adjacent research areas. We had stimulating presentations and lively discussions, with bidirectional knowledge sharing. Eventually the ground can be laid for establishing common semantics between the respective theories.

This year, 66 papers were submitted, from which 22 were selected to be included in this volume. In addition, the first nine papers present the invited talks. We wish to express our appreciation to all the authors of submitted papers, to the members of the Editorial Board and the Program Committee, and to the external reviewers for making ICCS 2005 a valuable contribution to the knowledge processing research field.

July 2005

Frithjof Dau
Marie-Laure Mugnier
Gerd Stumme

Organization

The International Conference on Conceptual Structures (ICCS) 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 Sydney (1996), at the University of Washington (Seattle, 1997), at the University of Montpellier (1998), at Virginia Tech (Blacksburg, 1999), at Darmstadt University of Technology (2000), at Stanford University (2001), in Borovets, Bulgaria (2002), at Dresden University of Technology (2003), and at the University of Alabama (Huntsville, 2004).

General Chair

Gerd Stumme University of Kassel, Germany

Program Chairs

Frithjof Dau Darmstadt Technical University, Germany
Marie-Laure Mugnier University of Montpellier, France

Editorial Board

Galia Angelova (Bulgaria)	Guy Mineau (Canada)
Michel Chein (France)	Bernard Moulin (Canada)
Aldo de Moor (Belgium)	Peter Øhrstrøm (Denmark)
Harry Delugach (USA)	Heather Pfeiffer (USA)
Peter Eklund (Australia)	Uta Priss (UK)
Bernhard Ganter (Germany)	John Sowa (USA)
Mary Keeler (USA)	Rudolf Wille (Germany)
Sergei Kuznetsov (Russia)	Karl Erich Wolff (Germany)
Wilfried Lex (Germany)	

Program Committee

Anne Berry (France)	David Genest (France)
Tru Cao (Vietnam)	Ollivier Haemmerlé (France)
Dan Corbett (Australia)	Roger Hartley (USA)
Olivier Corby (France)	Udo Hebisch (Germany)
Pavlin Dobrev (Bulgaria)	Joachim Hereth Correia (Germany)

VIII Organization

Richard Hill (UK)
Pascal Hitzler (Germany)
Kees Hoede (The Netherlands)
Julia Klinger (Germany)
Pavel Kocura (UK)
Robert Kremer (Canada)
Leonhard Kwuida (Germany)
M. Leclère (France)
Robert Levinson (USA)
Michel Liquière (France)
Carsten Lutz (Germany)
Philippe Martin (Australia)
Engelbert Mephu Nguifo (France)
Sergei Obiedkov (Russia)

Simon Polovina (UK)
Anne-Marie Rassinoux (Switzerland)
Gary Richmond (USA)
Olivier Ridoux (France)
Daniel Rochowiak (USA)
Sebastian Rudolph (Germany)
Eric Salvat (France)
Janos Sarbo (The Netherlands)
Henrik Schaerfe (Denmark)
Thanwadee T. Sunetnanta (Thailand)
William Tepfenhart (USA)
Petko Valtchev (Canada)
Sergei Yevtushenko (Germany)
G.Q. Zhang (USA)

External Reviewers

Sadok Ben Yahia (Tunisia)
Richard Cole (Australia)
Jon Ducrou (Australia)
Letha Etzkorn (USA)

Markus Krötzsch (Germany)
Boris Motik (Germany)
Anthony K. Seda (Ireland)

Table of Contents

Invited Papers

Patterns for the Pragmatic Web	1
<i>Aldo de Moor</i>	
Conceptual Graphs for Semantic Web Applications	19
<i>Rose Dieng-Kuntz, Olivier Corby</i>	
Knowledge Representation and Reasoning in (Controlled) Natural Language	51
<i>Norbert E. Fuchs</i>	
What Is a Concept?	52
<i>Joseph Goguen</i>	
Applications of Description Logics: State of the Art and Research Challenges	78
<i>Ian Horrocks</i>	
Methodologies for the Reliable Construction of Ontological Knowledge	91
<i>Eduard Hovy</i>	
Using Formal Concept Analysis and Information Flow for Modelling and Sharing Common Semantics: Lessons Learnt and Emergent Issues	107
<i>Yannis Kalfoglou, Marco Schorlemmer</i>	
On the Need to Bootstrap Ontology Learning with Extraction Grammar Learning	119
<i>Georgios Paliouras</i>	
Conzilla — A Conceptual Interface to the Semantic Web	136
<i>Mattias Palmér, Ambjörn Naeve</i>	

Theoretical Foundations

Variables in Concept Graphs	152
<i>Frithjof Dau</i>	
Arbitrary Relations in Formal Concept Analysis and Logical Information Systems	166
<i>Sébastien Ferré, Olivier Ridoux, Benjamin Sigonneau</i>	
Merge-Based Computation of Minimal Generators	181
<i>Céline Frambourg, Petko Valtchev, Robert Godin</i>	

Representation of Data Contexts and Their Concept Lattices in
 General Geometric Spaces 195
Tim B. Kaiser

Local Negation in Concept Graphs 209
Julia Klinger

Morphisms in Context 223
Markus Krötzsch, Pascal Hitzer, Guo-Qiang Zhang

Contextual Logic and Aristotle’s Syllogistic 238
Rudolf Wille

States of Distributed Objects in Conceptual Semantic Systems 250
Karl Erich Wolff

Knowledge Engineering and Tools

Hierarchical Knowledge Integration Using Layered Conceptual Graphs 267
Madalina Croitoru, Ernesto Compatangelo, Chris Mellish

Evaluation of Concept Lattices in a Web-Based Mail Browser 281
Shaun Domingo, Peter Eklund

D-SIFT: A Dynamic Simple Intuitive FCA Tool 295
Jon Ducrou, Bastian Wormuth, Peter Eklund

Analyzing Conflicts with Concept-Based Learning 307
Boris A. Galitsky, Sergei O. Kuznetsov, Mikhail V. Samokhin

Querying a Bioinformatic Data Sources Registry with Concept Lattices . . . 323
*Nizar Messai, Marie-Dominique Devignes, Amedeo Napoli,
 Malika Smail-Tabbone*

How Formal Concept Lattices Solve a Problem of Ancient Linguistics 337
Wiebke Petersen

A New Method to Interrogate and Check UML Class Diagrams 353
Thomas Raimbault, David Genest, Stéphane Loiseau

Knowledge Acquisition and Ontologies

Language Technologies Meet Ontology Acquisition 367
Galia Angelova

Weighted Pseudo-distances for Categorization in Semantic Hierarchies 381
Cliff A. Joslyn, William J. Bruno

Games of Inquiry for Collaborative Concept Structuring 396
Mary A. Keeler, Heather D. Pfeiffer

Toward Cooperatively-Built Knowledge Repositories	411
<i>Philippe Martin, Michael Blumenstein, Peter Deer</i>	
What Has Happened to Ontology	425
<i>Peter Øhrstrøm, Jan Andersen, Henrik Schärfe</i>	
Enhancing the Initial Requirements Capture of Multi-Agent Systems Through Conceptual Graphs	439
<i>Simon Polovina, Richard Hill</i>	
Outline of <i>trikonic</i> $\triangleright^* k$: Diagrammatic Trichotomic	453
<i>Gary Richmond</i>	
Author Index	467