

Lecture Notes in Artificial Intelligence 1638

Subseries of Lecture Notes in Computer Science

Edited by J. G. Carbonell and J. Siekmann

Lecture Notes in Computer Science

Edited by G. Goos, J. Hartmanis and J. van Leeuwen

Springer

Berlin

Heidelberg

New York

Barcelona

Hong Kong

London

Milan

Paris

Singapore

Tokyo

Anthony Hunter Simon Parsons (Eds.)

Symbolic and Quantitative Approaches to Reasoning and Uncertainty

European Conference, ECSQARU'99
London, UK, July 5-9, 1999
Proceedings



Springer

Series Editors

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

Volume Editors

Anthony Hunter
University College London, Department of Computer Science
Gower Street, London WC1E 6BT, UK
E-mail: a.hunter@cs.ucl.ac.uk

Simon Parsons
University of London, Queen Mary and Westfield College
Department of Electronic Engineering
London E1 4NS, UK
E-mail: s.d.parsons@elec.qmw.ac.uk

Cataloging-in-Publication Data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Symbolic and quantitative approaches to reasoning and uncertainty : European conference ; proceedings / ECSQARU'99, London, UK, July 5 - 9, 1999. Anthony Hunter ; Simon Parsons (ed.). - Berlin ; Heidelberg ; New York ; Barcelona ; Hong Kong ; London ; Milan ; Paris ; Singapore ; Tokyo : Springer, 1999
(Lecture notes in computer science ; Vol. 1638 : Lecture notes in artificial intelligence)
ISBN 3-540-66131-X

CR Subject Classification (1998): I.2.3, F.4.1

ISBN 3-540-66131-X Springer-Verlag 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-Verlag. Violations are liable for prosecution under the German Copyright Law.

© Springer-Verlag Berlin Heidelberg 1999
Printed in Germany

Typesetting: Camera-ready by author
SPIN: 10703448 06/3142 - 5 4 3 2 1 0 – Printed on acid-free paper

Preface

Uncertainty is an increasingly important research topic in many areas of computer science. Many formalisms are being developed, with much interest at the theory level directed at developing a better understanding of the formalisms and identifying relationships between formalisms, and at the technology level directed at developing software tools for formalisms and applications of formalisms.

The main European forum for the subject is the European Conference on Symbolic and Quantitative Approaches to Reasoning and Uncertainty (ECSQARU). Following the success of the previous ECSQARU conferences, held in Marseilles (1991), Granada (1993), Fribourg (1995), and Bonn (1997), the fifth conference in the series was held at University College London in July 1999.

This volume contains papers accepted for presentation at ECSQARU'99. In addition to the main conference, two workshops were held. The first was on Decision Theoretic and Game Theoretic Agents, chaired by Simon Parsons and Mike Wooldridge, and the second was on Logical and Uncertainty Models for Information Systems, chaired by Fabio Crestani and Mounia Lalmas. Selected papers from the workshops are also included in these proceedings.

We are indebted to the programme committee for their effort in organising the programme, to the invited speakers, and to the presenters of the tutorials. Furthermore, we gratefully acknowledge the contribution of the many referees who were involved in the reviewing process. Finally we would like to thank the Department of Computer Science at University College London for administrative support.

Programme Committee

The programme committee was chaired by Anthony Hunter (University College London), and comprised Dov Gabbay (King's College London), Finn Jensen (Aalborg University), Rudolf Kruse (University of Magdeburg), Simon Parsons (Queen Mary, University of London) Henri Prade (IRIT, Toulouse), Torsten Schaub (University of Potsdam), and Philippe Smets (ULB, Bruxelles).

Reviewers

The programme committee is very grateful for all the hard work contributed by the reviewers. Hopefully, we have not missed anyone from the following list: Bruce D'Ambrosio, Florence Bannay, Salem Benferhat, Philippe Besnard, Hugues Bersini, Christian Borgelt, Rachel Bourne, Stefan Brass, Laurence Cholvy, Roger Cooke, Adnan Darwiche, Yannis Dimopoulos, Jurgen Dix, Didier Dubois, Uwe Egly, Linda van der Gaag, Joerg Gebhardt, Siegfried Gottwald, Rolf Haenni, Jean-Yves Jaffray, Radim Jirousek, Ruth Kempson, Uffe Kjaerulf, Frank Klauwon, Aljoscha Klose, Juerg Kohlas, Paul Krause, Gerhard Lakemeyer, Mounia Lalmas, Jerome Lang, Kim G. Larsen, Norbert Lehmann, T. Y. Lin, Thomas Linke, Khalid Mellouli, Jerome Mengin, J.-J. Ch. Meyer, Sanjay Modgil, Yves Moinard, Serafin Moral, Detlef Nauck, Ann Nicholson, Pascal Nicolas, Dennis

Nilsson, Kristian G. Olesen, Rainer Palm, Zdzislaw Pawlak, Vincent Risch, Regis Sabbadin, Camilla Schwind, Prakash P. Shenoy, Milan Studeny, Heiko Timm, Hans Tompits, Marco Valtorta, and Cees Witteven.

April 1999

Anthony Hunter and Simon Parsons

Table of Contents

On the dynamics of default reasoning <i>Grigoris Antoniou</i>	1
Non-monotonic and paraconsistent reasoning: From basic entailments to plausible relations <i>Ofer Arieli and Arnon Avron</i>	11
A comparison of systematic and local search algorithms for regular CNF formulas <i>Ramón Béjar and Felip Manyà</i>	22
Query-answering in prioritized default logic <i>Farid Benhammadi, Pascal Nicolas and Torsten Schaub</i>	32
Updating directed belief networks <i>Boutheina Ben Yaghlane and Khaled Mellouli</i>	43
Inferring causal explanations <i>Philippe Besnard and Marie-Odile Cordier</i>	55
A critique of inductive causation <i>Christian Borgelt and Rudolf Kruse</i>	68
Connecting lexicographic with maximum entropy entailment <i>Rachel A. Bourne and Simon Parsons</i>	80
Avoiding non-ground variables <i>Stefan Brüning and Torsten Schaub</i>	92
Anchoring symbols to vision data by fuzzy logic <i>Silvia Coradeschi and Alessandro Saffiotti</i>	104
Filtering vs revision and update: Let us debate! <i>Corine Cossart and Catherine Tessier</i>	116
Irrelevance and independence axioms in quasi-Bayesian theory <i>Fabio G. Cozman</i>	128
Assessing the value of a candidate: A qualitative possibilistic approach <i>Didier Dubois, Michel Grabisch and Henri Prade</i>	137

Learning default theories <i>Béatrice Duval and Pascal Nicolas</i>	148
Knowledge representation for inductive learning <i>Peter A. Flach</i>	160
Handling inconsistency efficiently in the incremental construction of stratified belief bases <i>Eric Grégoire</i>	168
Rough knowledge discovery and applications <i>J. W. Guan and D. A. Bell</i>	179
Gradient descent training of Bayesian networks <i>Finn V. Jensen</i>	190
Open default theories over closed domains: An extended abstract <i>Michael Kaminski</i>	201
Shopbot economics <i>Jeffrey O. Kephart and Amy R. Greenwald</i>	208
Optimized algorithm for learning Bayesian network from data <i>Féidia Khalfallah and Khaled Mellouli</i>	221
Merging with integrity constraints <i>Sébastien Konieczny and Ramón Pino Pérez</i>	233
Boolean-like interpretation of Sugeno integral <i>Ivan Kramosil</i>	245
An alternative to outward propagation for Dempster-Shafer belief functions <i>Norbert Lehmann and Rolf Haenni</i>	256
On bottom-up pre-processing techniques for automated default reasoning <i>Thomas Linke and Torsten Schaub</i>	268
Probabilistic logic programming under maximum entropy <i>Thomas Lukasiewicz and Gabriele Kern-Isberner</i>	279
Lazy propagation and independence of causal influence <i>Anders L. Madsen and Bruce D'Ambrosio</i>	293

A Monte Carlo algorithm for combining Dempster-Shafer belief based on approximate pre-computation <i>Serafín Moral and Antonio Salmerón</i>	305
An extension of a linguistic negation model allowing us to deny nuanced property combinations <i>Daniel Pacholczyk</i>	316
Argumentation and qualitative decision making <i>Simon Parsons and Shaw Green</i>	328
Handling different forms of uncertainty in regression analysis: A fuzzy belief structure approach <i>Simon Petit-Renaud and Thierry Denœux</i>	340
State recognition in discrete dynamical systems using Petri nets and evidence theory <i>Michèle Rombaut, Iman Jarkass and Thierry Denœux</i>	352
Robot navigation and map building with the event calculus <i>Murray Shanahan and Mark Witkowski</i>	362
Information fusion in the context of stock index prediction <i>Stefan Siekmann, Jörg Gebhardt and Rudolf Kruse</i>	363
Defeasible goals <i>Leendert van der Torre</i>	374
Logical deduction using the local computation framework <i>Nic Wilson and Jérôme Mengin</i>	386
Author Index	397