Lecture Notes in Artificial Intelligence 3438

Edited by J. G. Carbonell and J. Siekmann

Subseries of Lecture Notes in Computer Science

Henning Christiansen Peter Rossen Skadhauge
Jørgen Villadsen (Eds.)

Constraint Solving and Language Processing

First International Workshop, CSLP 2004
Roskilde, Denmark, September 1-3, 2004
Revised Selected and Invited Papers

Series Editors

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

Volume Editors

Henning Christiansen
Roskilde University, Computer Science
Building 42.1, DK-4000 Roskilde, Denmark
E-mail: henning@ruc.dk

Peter Rossen Skadhauge
Copenhagen Business School, Department of Computational Linguistics
Center for Computational Modeling of Language
Bernhard Bangs Alle 17 B, DK-2000 Frederiksberg, Denmark
E-mail: prs@id.cbs.dk

Jørgen Villadsen
Roskilde University, Computer Science
Building 42.1, DK-4000 Roskilde, Denmark
E-mail: jv@ruc.dk

Library of Congress Control Number: 2005926888

CR Subject Classification (1998): I.2.3, I.2.6-7, I.2, F.4.2-3, D.1.6, D.3.2

ISSN 0302-9743
ISBN-10 3-540-26165-6 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-26165-0 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

springeronline.com

© Springer-Verlag Berlin Heidelberg 2005
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 11424574 06/3142 5 4 3 2 1 0

Preface

This volume contains selected and thoroughly revised papers plus contributions from invited speakers presented at the *First International Workshop on Constraint Solving and Language Processing*, held in Roskilde, Denmark, September 1–3, 2004.

Constraint Programming and Constraint Solving, in particular Constraint Logic Programming, appear to be a very promising platform, perhaps the most promising present platform, for bringing forward the state of the art in natural language processing, this due to the naturalness in specification and the direct relation to efficient implementation. Language, in the present context, may refer to written and spoken language, formal and semiformal language, and even general input data to multimodal and pervasive systems, which can be handled in very much the same ways using constraint programming.

The notion of constraints, with slightly differing meanings, apply in the characterization of linguistic and cognitive phenomena, in formalized linguistic models as well as in implementation-oriented frameworks. Programming techniques for constraint solving have been, and still are, in a period with rapid development of new efficient methods and paradigms from which language processing can profit. A common metaphor for human language processing is one big constraint solving process in which the different(-ly specified) linguistic and cognitive phases take place in parallel and with mutual cooperation, which fits quite well with current constraint programming paradigms.

It would be too much to claim that this volume gives an extensive overview of the area of constraint-based language processing, but one of our main goals with the publication is to give more attention to this important research direction and to provide an opportunity for researchers from different traditions and research environments to see themselves in this common trend. We can present a selection of interesting contributions, showing the spectrum from models grounded on cognitive studies to implementation-oriented formal models involving constraint programming. The often enthusiastic discussions at the workshop indicated a mutual interest and relevance across borders, and we are convinced that much more exciting research exists that can benefit from being brought into this forum. A second workshop on the topic is under preparation and we hope that the present volume can stimulate the interest.

We would like to thank the participants, the program committee, which is listed below, the invited speakers Philippe Blache, Veronica Dahl, Denys Duchier, and Gerald Penn, all researchers who submitted papers to the workshop, and those who made it practically possible.

Roskilde, March 2005 Henning Christiansen, Peter Rossen Skadhauge, Jørgen Villadsen

Organization

Organizing Committee, Editors

Henning Christiansen, Roskilde University (Chair)
Peter Rossen Skadhauge, Copenhagen Business School
Jørgen Villadsen, Roskilde University

Programme Committee

Troels Andreasen, Roskilde, Denmark
Philippe Blache, Aix-en-Provence, France
Henning Christiansen, Roskilde, Denmark (Chair)
Veronica Dahl, Simon Fraser University, Canada
Denys Duchier, LORIA, France
John Gallagher, Roskilde, Denmark
Claire Gardent, LORIA, France
Daniel Hardt, Copenhagen Business School, Denmark
Jørgen Fischer Nilsson, Technical University of Denmark
Kiril Simov, Bulgarian Academy of Science
Peter Rossen Skadhauge, Copenhagen Business School, Denmark
Jørgen Villadsen, Roskilde, Denmark

Sponsors

First International Workshop on Constraint Solving and Language Processing was supported by

- the CONTROL project, CONstraint based Tools for RObust Language processing, funded by the Danish Natural Science Research Council,
- CMOL, Center for Computational Modelling of Language at Copenhagen Business School, and
- Computer Science Section at Roskilde University, that also hosted the workshop.

Table of Contents

Invited Papers

Property Grammars: A Fully Constraint-Based Theory
Philippe Blache 1

An Abductive Treatment of Long Distance Dependencies in CHR
Veronica Dahl 17

Metagrammar Redux
Benoit Crabbé, Denys Duchier 32

The Other Syntax: Approaching Natural Language Semantics Through Logical Form Composition
Gerald Penn, Frank Richter 48

Contributed Papers

Gradience, Constructions and Constraint Systems
Philippe Blache, Jean-Philippe Prost 74

Problems of Inducing Large Coverage Constraint-Based Dependency Grammar for Czech
Ondřej Bojar 90

Multi-dimensional Graph Configuration for Natural Language Processing
Ralph Debusmann, Denys Duchier, Marco Kuhlmann 104

An Intuitive Tool for Constraint Based Grammars
Mathieu Estratat, Laurent Henocque 121

Parsing Unrestricted German Text with Defeasible Constraints
Kilian A. Foth, Michael Daum, Wolfgang Menzel 140

Animacy Information in Human Sentence Processing: An Incremental Optimization of Interpretation Approach
Monique Lamers, Helen de Hoop 158

An Exploratory Application of Constraint Optimization in Mozart to Probabilistic Natural Language Processing
Irene Langkilde-Geary 172

A Constraint-Based Model for Lexical and Syntactic Choice in Natural Language Generation
Véronique Moriceau, Patrick Saint-Dizier 184

Author Index 205