

# Contents

Conference Committee / ix

Program Committee / xi

Preface / xiii

## Invited Keynote Presentations

On Mechanization of Thought Processes (Extended Abstract) / 2  
*Jon Doyle*

Dataspaces: Co-existence with Heterogeneity / 3  
*David Maier, Alon Halevy, and Michael Franklin*

Users Are Always Right ... Even When They Are Wrong:  
Making Knowledge Representation Useful and Usable / 4  
*Alan Rector*

## Philosophical and Psychological Issues

Reasoning about Knowledge of Unawareness / 6  
*Joseph Y. Halpern and Leandro Chaves Rêgo*

Redoing the Foundations of Decision Theory / 14  
*Lawrence E. Blume, David A. Easley, and Joseph Y. Halpern*

Logical Foundations of Well-Founded Semantics / 25  
*Pedro Cabalar, Sergei Odintsov, and David Pearce*

A Theory of Vague Adjectives Grounded in Relevant Observables / 36  
*Brandon Bennett*

## Description Logics

Updating Description Logic ABoxes / 46  
*Hongkai Liu, Carsten Lutz, Maja Milicic, and Frank Wolter*

The Even More Irresistible SROIQ / 57  
*Ian Horrocks, Oliver Kutz, and Ulrike Sattler*

DL+log: Tight Integration of Description Logics and Disjunctive Datalog / 68  
*Riccardo Rosati*

Definitorially Complete Description Logics / 79

*Balder ten Cate, Willem Conradie, Maarten Marx, and Yde Venema*

From Wine to Water: Optimizing Description Logic Reasoning for Nominals / 90

*Evren Sirin, Bernardo Cuenca Grau, and Bijan Parsia*

An Ordered Theory Resolution Calculus for Hybrid Reasoning  
in First-Order Extensions of Description Logic / 100

*Scott Sanner and Sheila A. McIlraith*

## Argumentation

Constrained Argumentation Frameworks / 112

*Sylvie Coste-Marquis, Caroline Devred, and Pierre Marquis*

Knowledgebase Compilation for Efficient Logical Argumentation / 123

*Philippe Besnard and Anthony Hunter*

## Preferences

Planning with Qualitative Temporal Preferences / 134

*Meghyn Bienvenu, Christian Fritz, and Sheila A. McIlraith*

Expressive Power of Weighted Propositional Formulas for Cardinal Preference Modeling / 145

*Yann Chevaleyre, Ulle Endriss, and Jérôme Lang*

Decision-Theoretic GOLOG with Qualitative Preferences / 153

*Christian Fritz and Sheila A. McIlraith*

Variable-Strength Conditional Preferences for Matchmaking in Description Logics / 164

*Thomas Lukasiewicz and Jörg Schellhase*

Qualitative Decision Making with Bipolar Information / 175

*Didier Dubois and Hélène Fargier*

## Ontologies

Did I Damage My Ontology? A Case for Conservative Extensions in Description Logics / 187

*Silvio Ghilardi, Carsten Lutz, and Frank Wolter*

Modularity and Web Ontologies / 198

*Bernardo Cuenca Grau, Bijan Parsia, Evren Sirin, and Aditya Kalyanpur*

## Beliefs and Belief Revision

Iterated Revision as Prioritized Merging / 210

*James Delgrande, Didier Dubois, and Jérôme Lang*

Grounding and the Expression of Belief / 221

*Benoit Gaudou, Andreas Herzig, and Dominique Longin*

A Bad Day Surfing Is Better than a Good Day Working: How to Revise a Total Preorder / 230  
*Richard Booth, Thomas Meyer, and Ka-Shu Wong*

Lack of Finite Characterizations for the Distance-Based Revision / 239  
*Jonathan Ben-Naim*

Shapley Inconsistency Values / 249  
*Anthony Hunter and Sébastien Konieczny*

## Complexity Analysis

Data Complexity of Query Answering in Description Logics / 260  
*Diego Calvanese, Giuseppe De Giacomo, Domenico Lembo, Maurizio Lenzerini, and Riccardo Rosati*

A Tree Decomposition Algorithm for Conceptual Graph Projection / 271  
*Madalina Croitoru and Ernesto Comptangelo*

Propositional DAGs: A New Graph-Based Language for Representing Boolean Functions / 277  
*Michael Wachter and Rolf Haenni*

Representing Policies for Quantified Boolean Formulae / 286  
*Sylvie Coste-Marquis, Hélène Fargier, Jérôme Lang, Daniel Le Berre, and Pierre Marquis*

## Logic Programming

First-Order Loop Formulas for Normal Logic Programs / 298  
*Yin Chen, Fangzhen Lin, Yisong Wang, and Mingyi Zhang*

Computational Properties of Epistemic Logic Programs / 308  
*Yan Zhang*

Foundations for Knowledge-Based Programs using ES / 318  
*Jens Claßen and Gerhard Lakemeyer*

Query Answering under the Any-World Assumption for Normal Logic Programs / 329  
*Umberto Straccia*

Replacements in Non-Ground Answer-Set Programming / 340  
*Thomas Eiter, Michael Fink, Hans Tompits, Patrick Traxler, and Stefan Woltran*

## Space, Time, and Action

Abductive Visual Perception with Feature Clouds / 352  
*David Randell and Mark Witkowski*

The Features-and-Fluents Semantics for the Fluent Calculus / 362  
*Michael Thielscher and Thomas Witkowski*

Semantical Considerations for a Logic of Actions: An Imperative Manifesto / 371  
*Victor Jauregui*

Actions as Special Cases / 377  
*Selim T. Erdogan and Vladimir Lifschitz*

## Knowledge Representation Logics

Strong and Uniform Equivalence of Nonmonotonic Theories—An Algebraic Approach / 389

*Mirosław Truszczyński*

Description Logics with Circumscription / 400

*Piero Bonatti, Carsten Lutz, and Frank Wolter*

Semantics for Dynamic Syntactic Epistemic Logics / 411

*Thomas Agotnes and Natasha Alechina*

Probabilistic Abduction without Priors / 420

*Didier Dubois, Angelo Gilio, and Gabriele Kern-Isberner*

Non-Deterministic Semantics for First-Order Paraconsistent Logics / 431

*Anna Zamansky and Arnon Avron*

Possibilistic Handling of Uncertain Default Rules with Applications  
to Persistence Modeling and Fuzzy Default Reasoning / 440

*Florence Dupin de Saint-Cyr and Henri Prade*

## Knowledge Representation and Planning

Heuristics for Planning with Penalties and Rewards using Compiled Knowledge / 452

*Blai Bonet and Héctor Geffner*

On the Limits of Planning over Belief States under Strict Uncertainty / 463

*Sebastian Sardina, Giuseppe De Giacomo, Yves Lespérance, and Hector J. Levesque*

Temporalizing Cardinal Directions: From Constraint Satisfaction to Planning / 472

*Marco Ragni and Stefan Wölfl*

On the Completeness of Approximation Based Reasoning and  
Planning in Action Theories with Incomplete Information / 481

*Tan Cao Son and Phan Huy Tu*

On Planning with Programs that Sense / 492

*Jorge A. Baier and Sheila A. McIlraith*

Planning with Prioritized Goals / 503

*Robert Feldmann, Gerhard Brewka, and Sandro Wenzel*

Index / 515