

# **22nd International Conference on Principles of Knowledge Representation and Reasoning (KR2025)**

Melbourne, Australia  
11-17 November 2025

ISBN: 979-8-3313-3684-4

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2025) by International Joint Conference on Artificial Intelligence (IJCAI)  
All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from the publisher.

Printed with permission by Curran Associates, Inc. (2026)

For permission requests, please contact International Joint Conference on Artificial Intelligence (IJCAI) at the address below.

International Joint Conference on Artificial Intelligence (IJCAI)  
Information Sciences Institute/USC 4676  
Admiralty Way, Marina del Rey  
CA 90292  
USA

Phone: +49 (761) 203-8221

Fax: +49 (761) 203-8222

[nebel@ijcai.org](mailto:nebel@ijcai.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

## MAIN TRACK

Model Checking Linear Temporal Logic with Standpoint Modalities. ....	2
<i>Rajab Aghamov, Christel Baier, Toghrul Karimov, Rupak Majumdar, Joël Ouaknine, Jakob Piribauer, Timm Spork</i>	
Presburger Functional Synthesis: Complexity and Tractable Normal Forms. ....	12
<i>S. Akshay, A. R. Balasubramanian, Supratik Chakraborty, Georg Zetsche</i>	
Extending Abstract Argumentation Frameworks with Knowledge Bases. ....	24
<i>Gianvincenzo Alfano, Sergio Greco, Cristian Molinaro, Francesco Parisi, Irina Trubitsyna</i>	
Axiomatic Characterisations of Argumentation Semantics. ....	36
<i>Leila Amgoud</i>	
Compactness and Preservation in Logical Argumentation Frameworks. ....	46
<i>Ofer Arieli, Christian Strasser</i>	
Reasoning with Restricted Statistical Statements in Probabilistic Answer Set Programming: Complexity and Algorithms. ....	56
<i>Damiano Azzolini, Markus Hecher</i>	
A Novel Framework for Reasoning Over Optimization Problems in Probabilistic Answer Set Programming. ....	67
<i>Damiano Azzolini, Giuseppe Mazzotta, Francesco Ricca, Fabrizio Riguzzi</i>	
Counting Solutions Under Cardinality Constraints: Structure Counts in Counting.....	78
<i>Max Bannach, Markus Hecher</i>	
Guarded Fragments Meet Dynamic Logic: The Story of Regular Guards. ....	89
<i>Bartosz Bednarczyk, Emanuel Kieronski</i>	
FastFound: Easing the ASP Bottleneck Via Predicate-Decoupled Grounding. ....	100
<i>Alexander Beiser, Martin Gebser, Markus Hecher, Stefan Woltran</i>	
An Axiomatic Study of a Modular Evaluation of Enthymeme Decoding in Weighted Structured Argumentation. ....	110
<i>Jonathan Ben-Naim, Victor David, Anthony Hunter</i>	
Sequence Explanations for Acceptance in Abstract Argumentation. ....	121
<i>Lars Bengel, Matthias Thimm</i>	
A Reduct-Based Approach to Skeptical Preferred Reasoning in Abstract Argumentation. ....	132
<i>Lars Bengel, Julian Sander, Matthias Thimm</i>	
On Strong and Weak Admissibility in Non-Flat Assumption-Based Argumentation. ....	137
<i>Matti Berthold, Lydia Blümel, Anna Rapberger</i>	
Strategy Logic, Imperfect Information, and Hyperproperties. ....	148
<i>Raven Beutner, Bernd Finkbeiner</i>	

Tractable Responsibility Measures for Ontology-Mediated Query Answering.....	154
<i>Meghyn Bienvenu, Diego Figueira, Pierre Lafourcade</i>	
A Rule-Based Approach to Specifying Preferences Over Conflicting Facts and Querying Inconsistent Knowledge Bases.....	164
<i>Meghyn Bienvenu, Camille Bourgaux, Katsumi Inoue, Robin Jean</i>	
Halting Recurrent GNNs and the Graded $\mu$ -Calculus.....	175
<i>Jeroen Bollen, Jan Van Den Bussche, Stijn Vansummeren, Jonni Virtema</i>	
An Intuitionistic Version of Alternating-Time Temporal Logic.....	185
<i>Laura Bozzelli, Andrea Capone, Davide Catta, Aniello Murano</i>	
Finite Axiomatizability by Disjunctive Existential Rules.....	196
<i>Marco Calautti, Marco Console, Andreas Pieris</i>	
On the Complexity of Global Necessary Reasons to Explain Classification.....	206
<i>Marco Calautti, Enrico Malizia, Cristian Molinaro</i>	
Reasoning in Defeasible Description Logics with System W and Lexicographic Inference.....	218
<i>Giovanni Casini, Jonas Haldimann, Thomas Meyer</i>	
How Lucky Are You to Know Your Way? a Probabilistic Approach to Knowing How Logics.....	229
<i>Pablo F. Castro, Pedro R. D'Argenio, Raul Fervari</i>	
Boolean Nearest Neighbor Language in the Knowledge Compilation Map.....	240
<i>Ondrej Cepek, Jelena Glišić</i>	
Belief Revision in a Probabilistic Setting.....	250
<i>James P. Delgrande, Gerhard Lakemeyer, Maurice Pagnucco, Joshua Sack</i>	
On the Effects of Adding Assignments in Linear-Time Temporal Logics Modulo Theories.....	260
<i>Stéphane Demri, Raul Fervari</i>	
Minimal Model Reasoning in Description Logics: Don't Try This at Home!.....	271
<i>Federica Di Stefano, Quentin Manière, Magdalena Ortiz, Mantas Šimkus</i>	
Grounding Rule-Based Argumentation Using Datalog.....	281
<i>Martin Diller, Sarah Alice Gaggl, Philipp Hanisch, Giuseppina Monterosso, Fritz Rauschenbach</i>	
An Information-Flow Perspective on Explainability Requirements: Specification and Verification.....	293
<i>Bernd Finkbeiner, Hadar Frenkel, Julian Siber</i>	
Categorical Explaining Functors: Ensuring Coherence in Logical Explanations.....	306
<i>Stefano Fioravanti, Francesco Giannini, Pietro Barbiero, Paolo Frazzetto, Roberto Confalonieri, Fabio Zanasi, Nicolò Navarin</i>	
Two-Variable Logic for Hierarchically Partitioned and Ordered Data.....	316
<i>Oskar Fiuk, Emanuel Kieronski, Vincent Michielini</i>	
A Logic-Based Framework for Database Repairs.....	326
<i>Nicolas Fröhlich, Arne Meier, Nina Pardal, Jonni Virtema</i>	
Fitting Description Logic Ontologies to ABox and Query Examples.....	336
<i>Maurice Funk, Marvin Grosser, Carsten Lutz</i>	

About the Multi-Head Linear Restricted Chase Termination. ....	346
<i>Lukas Gerlach, Lucas Larroque, Jerzy Marcinkowski, Piotr Ostropolski-Nalewaja</i>	
Reasoning About Knowledge on Regular Expressions is 2EXPTIME-Complete. ....	356
<i>Avijeet Ghosh, Sujata Ghosh, François Schwarzentruber</i>	
Putting Perspective into OWL [Sic]: Complexity-Neutral Standpoint Reasoning for Ontology Languages Via Monodic S5 Over Counting Two-Variable First-Order Logic. ....	366
<i>Lucía Gómez Álvarez, Sebastian Rudolph</i>	
A Framework for Inconsistency-Tolerant Reasoning with Sets of Models. ....	376
<i>Yehia Hatab, Kai Sauerwald, Matthias Thimm</i>	
Repairing General Game Descriptions. ....	386
<i>Yifan He, Munyque Mittelmann, Aniello Murano, Abdallah Saffidine, Michael Thielscher</i>	
An Analysis of the Role of Syntax in Inductive Inference. ....	396
<i>Jesse Heyninck, Richard Booth, Thomas Meyer, Lars-Phillip Spiegel</i>	
Fitting Ontologies and Constraints to Relational Structures.....	407
<i>Simon Hosemann, Jean Christoph Jung, Carsten Lutz, Sebastian Rudolph</i>	
Complexity of Abduction in Łukasiewicz Logic. ....	417
<i>Katsumi Inoue, Daniil Kozhemiachenko</i>	
Effective AGM Belief Contraction: A Journey Beyond the Finitary Realm.....	429
<i>Dominik Klumpp, Jandson S. Ribeiro</i>	
Abstractions of Queries in Ontology-Based Data Access.....	440
<i>Michel Leclère, Marie-Laure Mugnier, Guillaume Pérution-Kihli</i>	
An Epistemic Theory of Deductive Arguments.....	450
<i>Emiliano Lorini</i>	
Non-Deterministic Action Reversibility: Complexity Results. ....	462
<i>Jakub Med, Michael Morak, Lukáš Chrpá, Wolfgang Faber</i>	
Solving Unification in the Description Logic FL_bottom.....	467
<i>Barbara Morawska, Dariusz Marzec</i>	
Logical Expressivity and Explanations for Monotonic GNNs with Scoring Functions. ....	477
<i>Matthew Morris, David J. Tena Cucala, Bernardo Cuenca Grau</i>	
Faithful Differentiable Reasoning with Reshuffled Region-Based Embeddings.....	489
<i>Aleksandar Pavlovic, Emanuel Sallinger, Steven Schockaert</i>	
A Methodology for Incompleteness-Tolerant and Modular Gradual Semantics for Argumentative Statement Graphs. ....	500
<i>Antonio Rago, Stylianos Loukas Vasileiou, Son Tran, Francesca Toni, William Yeoh</i>	
On Gradual Semantics for Assumption-Based Argumentation.....	512
<i>Anna Rapberger, Fabrizio Russo, Antonio Rago, Francesca Toni</i>	
On the Complexity and Properties of Preferential Propositional Dependence Logic.....	523
<i>Kai Sauerwald, Arne Meier, Juha Kontinen</i>	

Context-Based Belief Revision. ....	534
<i>Nicolas Schwind</i>	
Efficient Volume Computation for SMT Formulas. ....	544
<i>Arijit Shaw, Uddalok Sarkar, Kuldeep S. Meel</i>	
A Principle-Based Framework for Analyzing Dialogue Game-Based Semantics. ....	555
<i>Yamil O. Soto, Andrea Cohen, Cristhian Ariel D. Deagustini, Maria Vanina Martinez, Gerardo I. Simari</i>	
Pushdown Reward Machines for Reinforcement Learning. ....	566
<i>Giovanni Varricchione, Toryn Q. Klassen, Natasha Alechina, Mehdi Dastani, Brian Logan, Sheila A. McIlraith</i>	

## **KR IN THE WILD**

Exploring Desirable Configurations in Global Logistics with Heuristic Search in Answer Set Programming. ....	578
<i>Olçay Altay-Kern, Emmanuelle Dietz, Isabelle Kuhlmann, Matthias Thimm</i>	
Model Checker for Recursive Aggregates. ....	588
<i>Mario Alviano, Carmine Dodaro, Salvatore Fiorentino</i>	
Interactive Exploration of Plan Spaces. ....	599
<i>Daniel Gnad, Markus Hecher, Sarah Alice Gaggl, Dominik Rusovac, David Speck, Johannes K. Fichte</i>	
Reasoning About Actual Causality in Answer Set Programming. ....	610
<i>Daniel Özcan, Dalal Alrajeh, Robert Craven</i>	
Can LLMs Solve ASP Problems? Insights from a Benchmarking Study. ....	621
<i>Lin Ren, Guohui Xiao, Guilin Qi, Yishuai Geng, Haohan Xue</i>	
ASP-Driven Visual Commonsense: A General Framework for Reasoning About Embodied Interaction in the Wild. ....	632
<i>Jakob Suchan, Mehul Bhatt, Ulius Monsen</i>	
A Tensor-Based Probabilistic Event Calculus. ....	643
<i>Efthimis Tsilonis, Alexander Artikis, Georgios Paliouras</i>	
TRACE-CS: A Hybrid Logic–LLM System for Explainable Course Scheduling. ....	653
<i>Stylianos Loukas Vasileiou, William Yeoh</i>	
Advances in Logic-Based Entity Resolution: Enhancing ASPEN with Local Merges and Optimality Criteria. ....	659
<i>Zhiliang Xiang, Meghyn Bienvenu, Gianluca Cima, Víctor Gutiérrez-Basulto, Yazmín Ibáñez-García</i>	
An Embarrassingly Parallel Model Counter. ....	670
<i>Zhenghang Xu, Minghao Yin, Jean Marie Lagniez</i>	

## **KRAND CONSTRAINTS**

Expressive Description Logics with Rich Yet Affordable Numeric Constraints. ....	683
<i>Federica Di Stefano, Sanja Lukumbuza, Magdalena Ortiz, Mantas Šimkus</i>	

Counterexample-Guided Abstraction Refinement for Assumption-Based Argumentation. .... 694  
*Jean Marie Lagniez, Emmanuel Lonca, Jean-Guy Mailly*

Reasoning in Assumption-Based Argumentation Via SAT. .... 707  
*Andreas Niskanen, Masood Feyzbakhsh Rankooh, Tuomo Lehtonen, Matti Järvisalo*

## **KR IN PLANNING AND SCHEDULING**

LTL Synthesis Under Multi-Agent Environment Assumptions. .... 719  
*Benjamin Aminof, Giuseppe De Giacomo, Giuseppe Perelli, Sasha Rubin*

Depth-Bounded Epistemic Planning..... 729  
*Thomas Bolander, Alessandro Burigana, Marco Montali*

Learning General Policies from Examples. .... 740  
*Blai Bonet, Hector Geffner*

Automated Planning with Ontologies Under Coherence Update Semantics. .... 751  
*Stefan Borgwardt, Duy Nhu, Gabriele Röger*

Pushing the Envelope in Numeric Pattern Planning. .... 762  
*Matteo Cardellini, Enrico Giunchiglia*

Pruning with Belief Traps in Multi-Agent Epistemic Planning..... 773  
*Biqing Fang, Fangzhen Lin*

Cost-Optimal Delete-Free Classical Planning Via Maximum Satisfiability. .... 783  
*Masood Feyzbakhsh Rankooh, Andreas Niskanen, Matti Järvisalo*

Counterfactual Scenarios for Automated Planning..... 794  
*Nicola Gigante, Francesco Leofante, Andrea Micheli*

Domain-Independent Instance Generation for Classical Planning. .... 805  
*Claudia Grundke, Malte Helmert, Gabriele Röger*

Emerson-Lei and Manna-Pnueli Games for LTLf+ and PPLTL+ Synthesis. .... 810  
*Daniel Hausmann, Shufang Zhu, Gianmarco Parretti, Christoph Weinhuber, Giuseppe De Giacomo, Nir Piterman*

Representing Perfect Saturated Cost Partitioning Heuristics in Classical Planning. .... 821  
*Paul Höft, David Speck, Jendrik Seipp*

Learning Lifted Action Models from Traces of Incomplete Actions and States..... 832  
*Niklas Jansen, Jonas Gösgens, Hector Geffner*

Generalizing Platform-Aware Mission Planning for Infinite-State Timed Transition Systems. .... 843  
*Stefan Panjkovic, Alessandro Cimatti, Andrea Micheli, Stefano Tonetta*

A Planning Compilation to Reason About Goal Achievement at Planning Time. .... 853  
*Alberto Pozanco, Marianela Morales, Daniel Borrajo, Manuela Veloso*

Explanations for Unrealizability of Infinite-State Safety Shields..... 858  
*Andoni Rodríguez, Irfansha Shaik, Davide Corsi, Roy Fox, César Sánchez*

Probabilistic HTN Planning: Formalization and Computational Complexity Analysis. .... 869  
*Mohammad Yousefi, Johannes Schmalz, Patrik Haslum, Pascal Bercher*

Probabilistic Active Goal Recognition. .... 880  
*Chenyuan Zhang, Cristian Rojas Cardenas, Hamid Reza Tofighi, Mor Vered, Buser Say*

**Author Index**