

Certified Unsolvability in Classical Planning

Bibliography

Salomé Eriksson Gabriele Röger Malte Helmert

University of Basel, Switzerland

ICAPS 2020

Certified Unsolvability in Classical Planning

Bibliography

Certifying Algorithms and Proof Systems

- ▶ Ross M. McConnell, Kurt Mehlhorn, Stefan Näher, Pascal Schweitzer.
[Certifying Algorithms](#). Computer Science Review 2011
 - ▶ introduces the concept of certifying algorithms
- ▶ Mohammad Abdulaziz, Peter Lammich.
[A Formally Verified Validator for Classical Planning Problems and Solutions](#). ICTAI 2018
 - ▶ plan validator built with theorem prover
 - ▶ shows that VAL/INVAL still contain bugs (fringe cases)
- ▶ Gerhard Gentzen.
[Untersuchungen über das logische Schließen. I.](#) Mathematische Zeitschrift 1935
 - ▶ introduces the concept of natural deduction

Unsolvability Certificates

- ▶ Salomé Eriksson, Gabriele Röger, Malte Helmert.
[Unsolvability Certificates for Classical Planning](#). ICAPS 2017
 - ▶ inductive certificates
- ▶ Salomé Eriksson, Gabriele Röger, Malte Helmert.
[A Proof System for Unsolvable Planning Tasks](#). ICAPS 2018
 - ▶ first version of the unsolvability proof system
- ▶ Salomé Eriksson.
[Certifying Planning Systems: Witnesses for Unsolvability](#). Ph.D. Dissertation, University of Basel.
 - ▶ description and comparison of both inductive certificates and unsolvability proof system
 - ▶ augmentations to proof system
 - ▶ analysis of efficient verification with **R**-formalisms

Representation formalisms

- ▶ Adnan Darwiche, Pierre Marquis.
[A Knowledge Compilation Map](#). JAIR 2002
 - ▶ thorough analysis of different knowledge representations
 - ▶ describes operations for **R**-formalisms
- ▶ Stefan Edelkamp, Peter Kissmann.
[On the Complexity of BDDs for State Space Search: A Case Study in Connect Four](#). AAAI 2011
 - ▶ shows that information like mutexes cannot be efficiently encoded in one BDD

Planning techniques

- ▶ Marcel Steinmetz, Jörg Hoffmann.
[State space search nogood learning: Online refinement of critical-path dead-end detectors in planning](#). Artificial Intelligence 2017
 - ▶ iterative refinement of h^c specialized on finding dead-ends
- ▶ Malte Helmert, Patrik Haslum, Jörg Hoffmann, Raz Nissim.
[Merge-and-Shrink Abstraction: A Method for Generating Lower Bounds in Factored State Spaces](#). Journal of the ACM 2014
 - ▶ translation from M&S representation to ADD
- ▶ Malte Helmert, Gabriele Röger, Silvan Sievers.
[On the Expressive Power of Non-Linear Merge-and-Shrink Representations](#). ICAPS 2015
 - ▶ non-linear merge strategies cannot be represented by ADDs
- ▶ Vidal Alcázar, Álvaro Torralba.
[A Reminder about the Importance of Computing and Exploiting Invariants in Planning](#). ICAPS 2015
 - ▶ description of the h^2 preprocessor used in many planners