

# Certified Unsolvability in Classical Planning

## Bibliography

Salomé Eriksson   Gabriele Röger   Malte Helmert

University of Basel, Switzerland

ICAPS 2020

Eriksson, Röger, Helmert

Certified Unsolvability in Classical Planning

1 / 6

# Certified Unsolvability in Classical Planning

## Bibliography

Eriksson, Röger, Helmert

Certified Unsolvability in Classical Planning

2 / 6

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

Eriksson, Röger, Helmert

Certified Unsolvability in Classical Planning

3 / 6

Bibliography

## 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

Eriksson, Röger, Helmert

Certified Unsolvability in Classical Planning

4 / 6

## 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