On Weak Stubborn Sets in Classical Planning

Silvan Sievers[1]   Martin Wehrle

[1]University of Basel, Switzerland

Setting

▶ solving optimal classical planning tasks with A^* search

Setting

- solving optimal classical planning tasks with A* search
- safe pruning with stubborn sets:
  - subset of the operators
  - restrict successor generation to applicable operators in stubborn set
  - guarantee preservation of at least one optimal plan

Setting

- solving optimal classical planning tasks with A^* search
- safe pruning with stubborn sets:
    - subset of the operators
    - restrict successor generation to applicable operators in stubborn set
    - guarantee preservation of at least one optimal plan
- several flavors:
    - weak and strong stubborn sets (Valmari, APN 1989)
    - generalized strong stubborn sets (GSSS) (Wehrle & Helmert, ICAPS 2014)

Contributions

- ▶ investigation of previously called "weak stubborn sets" in planning:
  - ▶ not stubborn sets in the original sense
  - ▶ called compliant stubborn sets (CSS) from now on

Contributions

- ▶ investigation of previously called "weak stubborn sets" in planning:
  - ▶ not stubborn sets in the original sense
  - ▶ called compliant stubborn sets (CSS) from now on
- ▶ generalized weak stubborn sets (GWSS):
  - ▶ reflect the (generalized) original definition
  - ▶ safe pruning function
  - ▶ exponentially higher pruning power than GSSS
  - ▶ incomparable pruning power with CSS

Contributions

- ▶ investigation of previously called "weak stubborn sets" in planning:
  - ▶ not stubborn sets in the original sense
  - ▶ called compliant stubborn sets (CSS) from now on
- ▶ generalized weak stubborn sets (GWSS):
  - ▶ reflect the (generalized) original definition
  - ▶ safe pruning function
  - ▶ exponentially higher pruning power than GSSS
  - ▶ incomparable pruning power with CSS
- ▶ experimental evaluation: confirm theoretical results