

Online Saturated Cost Partitioning for Classical Planning

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Setting and Motivation

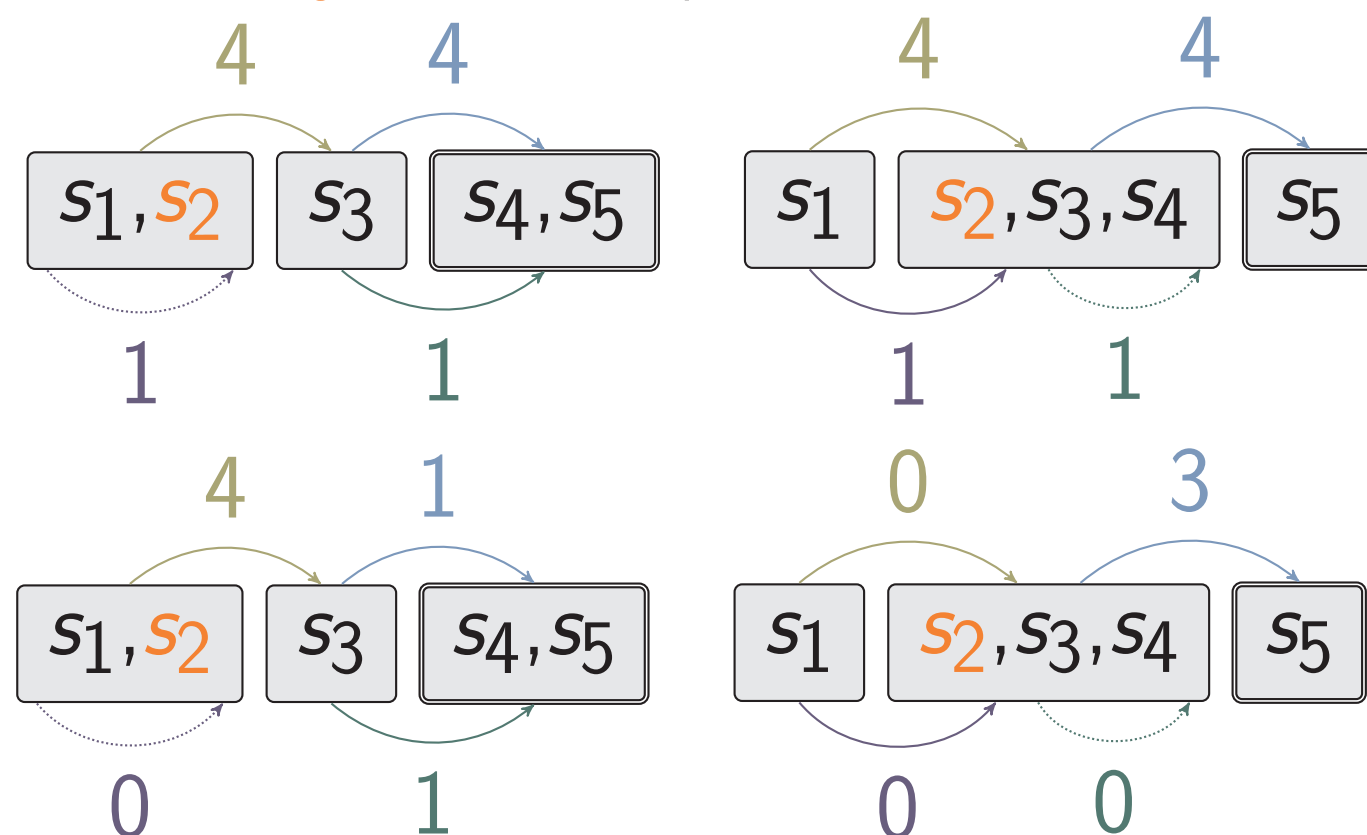
- ▶ optimal classical planning
 - ▶ A* search + multiple abstraction heuristics
 - ▶ (saturated) cost partitioning
 - ▶ different states need different cost partitionings
 - ▶ **precompute** cost partitionings
- no good stopping criterion, search starts late
- ▶ compute cost partitioning for **each state**
- too expensive

Cost partitioning

- ▶ **split action costs** among heuristics
- ▶ ensure that sum of costs \leq original cost

Saturated cost partitioning

- ▶ order heuristics, then for each heuristic h :
 - ▶ use **minimum costs** preserving all estimates of h
 - ▶ use **remaining costs** for subsequent heuristics



Offline diversification

- ▶ sample 1000 states
- ▶ start with empty set of orders
- ▶ until time limit is reached:
 - ▶ compute order for new sample
 - ▶ store order if a sample profits from it

Online diversification: ComputeHeuristic(s)

- ▶ if SELECT(s) and not time limit reached
 - ▶ compute order for s
 - ▶ store order if s profits from it
- ▶ return maximum over all stored orders for s

Selection strategies

- ▶ Bellman (Eifler and Fickert 2018)
- ▶ Novelty (Lipovetzky and Geffner 2012)
- ▶ Interval

Offline vs. online diversification

Offline

- ▶ compute orders for **samples** for **T seconds**
- ▶ store order if one of **1000 samples** profits from it

Online

- ▶ compute orders for subset of evaluated **states** for **at most T seconds**
- ▶ store order if **single** evaluated **state** profits from it

Results

