The Dependence of Effective Planning Horizon on Model Accuracy

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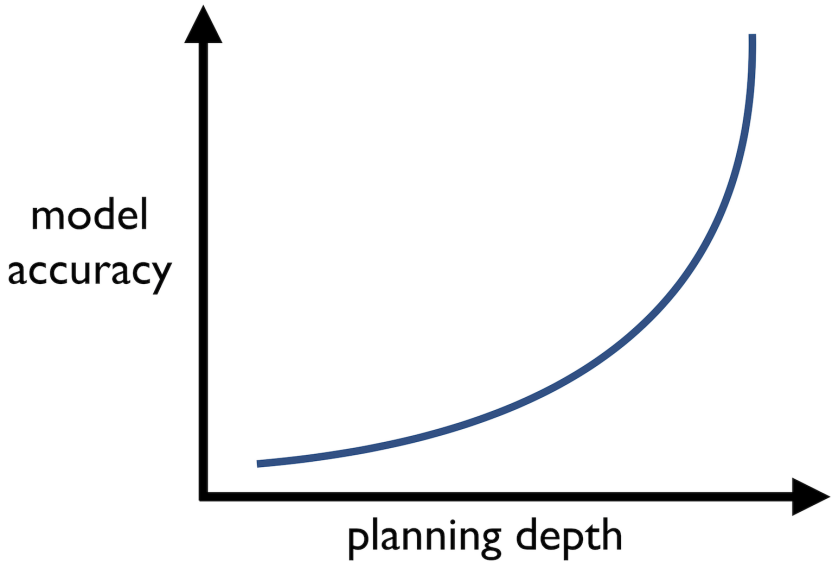
December 15, 2015

Outline

1. What is the point?
2. RandomMDP Story
3. RandomMDP Results
4. UCT Story
5. UCT Results

What is the Point?

Planning Depth should be determined proportionally to model accuracy

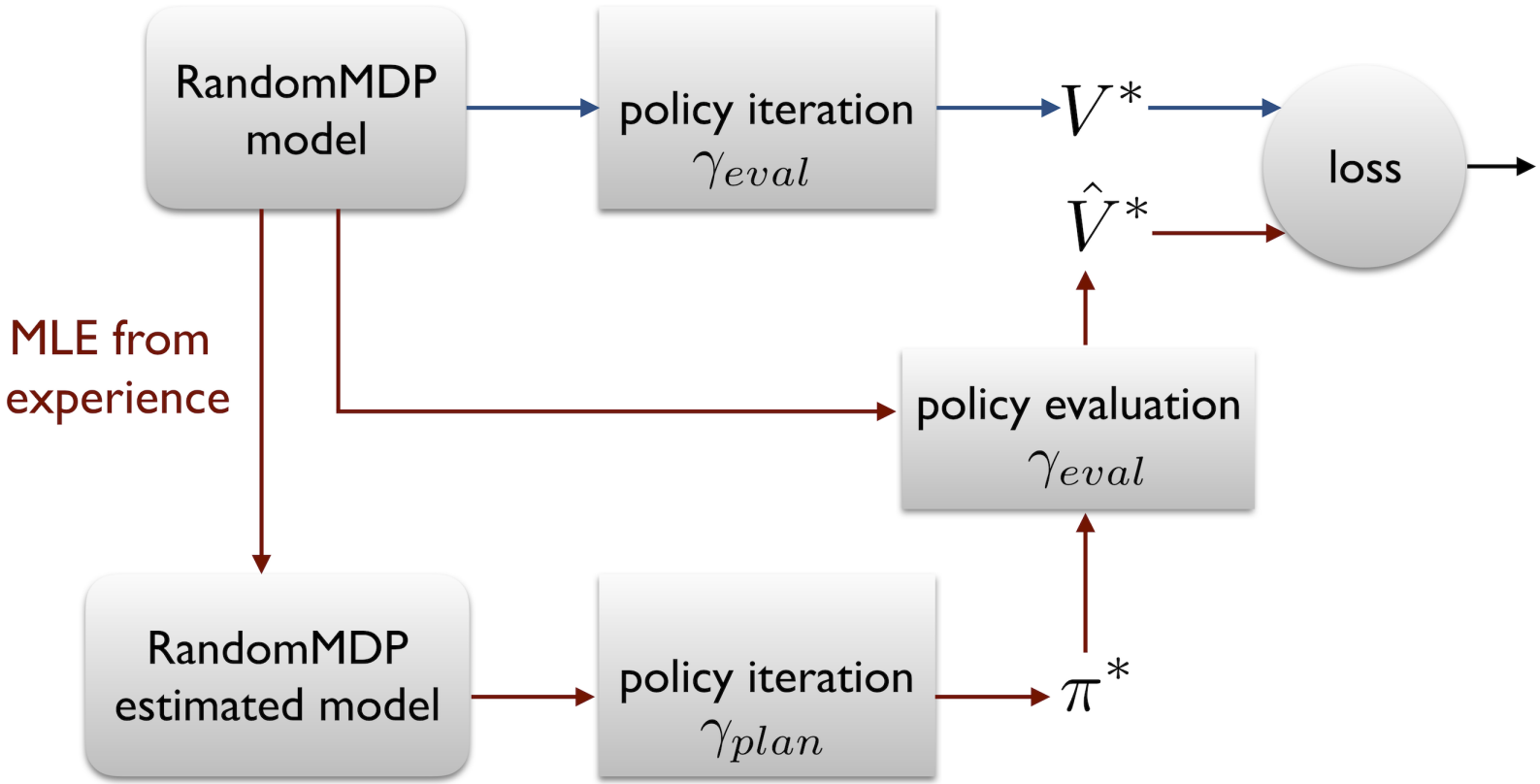


RandomMDP Story

The evaluation is performed on a MDP designed by the authors, called RandomMDP, specified as:

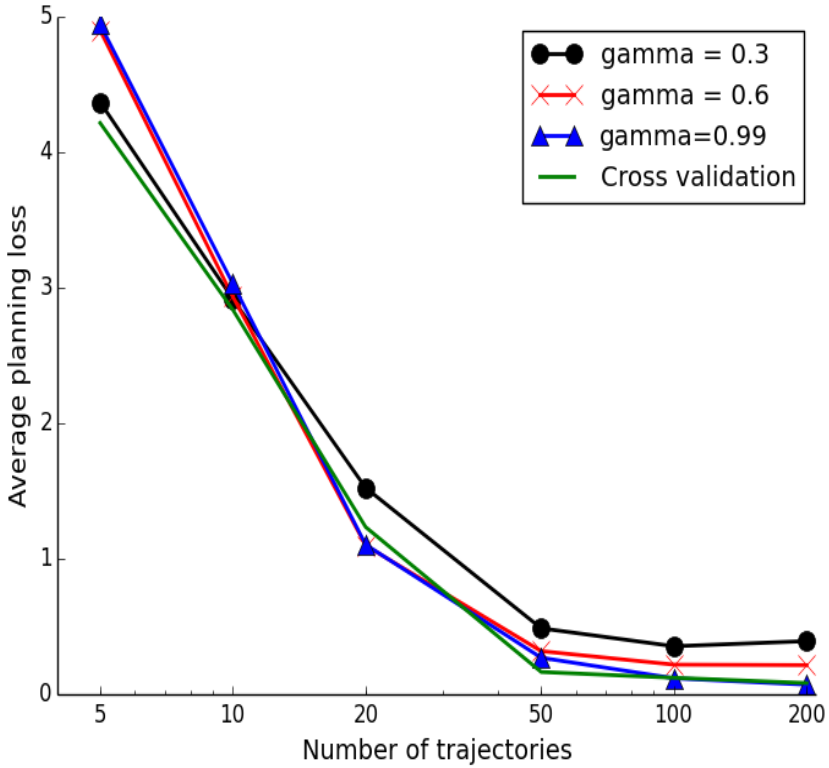
1. 10 states, 2 actions
2. Given state and action, choose next state uniformly random from 5 possible states
3. Rewards $\sim$ uniform$(0, 1)$, sample rewards have additive Gaussian noise
4. $\gamma_{eval} = 0.99$ and $\gamma_{plan} = 0.3, 0.66,$ and 0.99

RandomMDP Evaluation approach

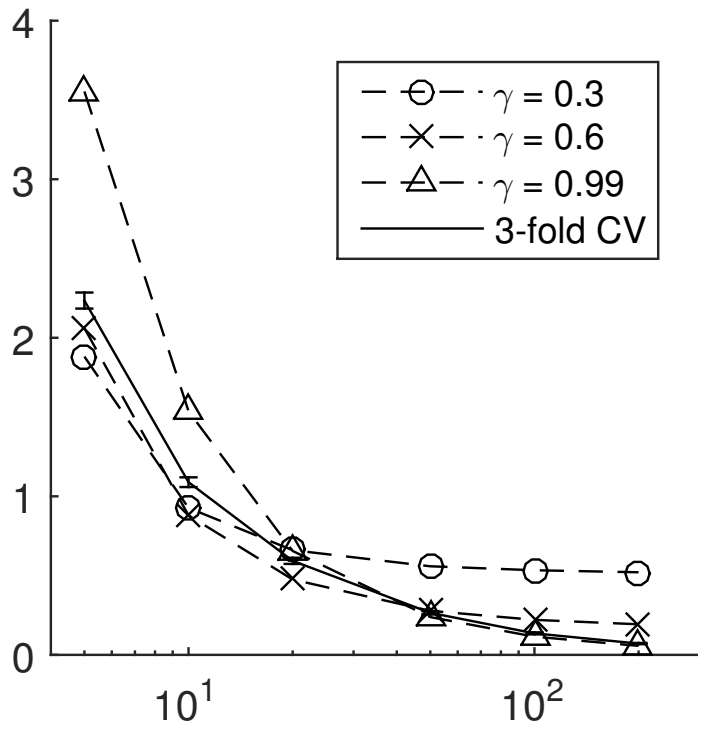


RandomMDP Results

our results



their results



RandomMDP Reproducibility Discussion

- Definition of RandomMDP
- Loss function
- Plot readability

UCT Story

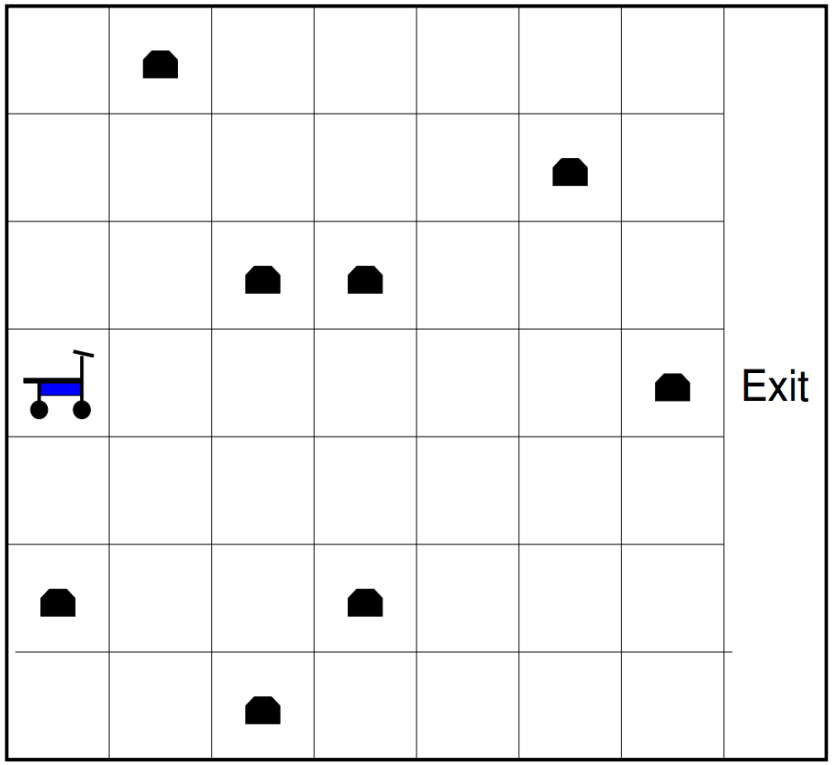
UCT:

- UCB
- Monte Carlo Planning

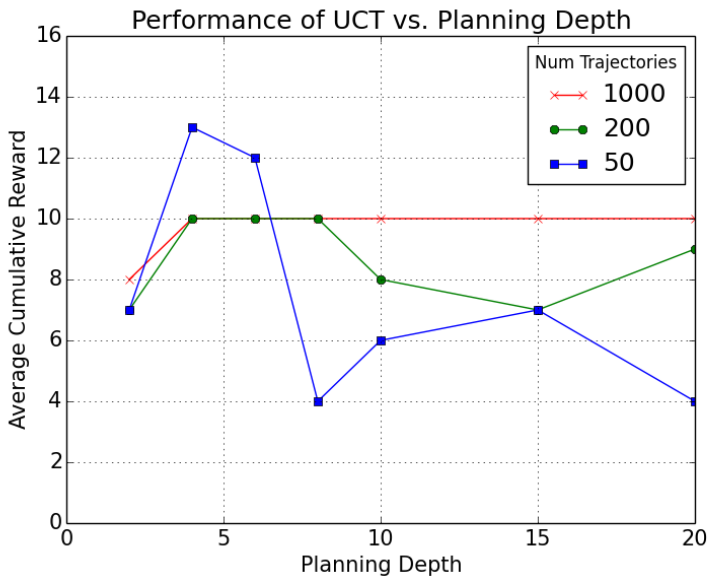
Experiments:

- Rock Sample Domain
- Comparing UCT performance with different planning depths.

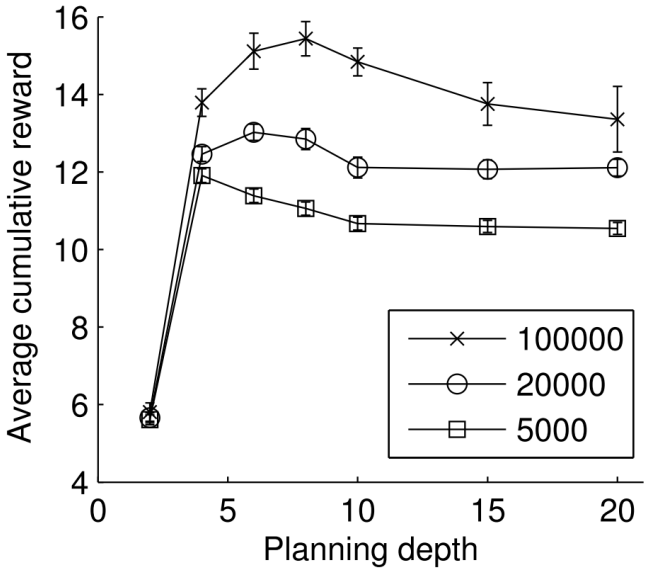
Rock Sample Domain



UCT Results



(a) Our results



(b) Their results

UCT Reproducibility Discussion

- Ambiguities of UCT
- Ambiguities of Rock Sample
- Computational Limitations