

Multi-step RL: Unifying Algorithm

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November 4, 2017

Overview

- 1 Introduction
- 2 From Monte Carlo and one-step TD to multi-step Bootstrapping
- 3 Algorithm
- 4 Conclusion

Results

Monte Carlo methods

One-step TD methods

n -step TD methods

$Q(\sigma)$ algorithm

Initialize $S_0 \neq \text{terminal}$

Select A_0 according to $\pi(.|S_0)$

Store $S_0, A_0, Q(S_0, A_0)$

for $t = 0, \dots, T + n - 1$ **do**

if $t < T$ **then**

 Take Action A_t , observe R and store S_{t+1}

end if

end for

Intuition and Examples

Synopsis

- $Q(\sigma)$ unifies n -step Sarsa and Tree-backup
- $Q(\sigma)|_{\sigma=0}$ is Tree-backup
- $Q(\sigma)|_{\sigma=1}$ is n -step Sarsa

References



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Richard S. Sutton, Andrew G. Barto.

Reinforcement Learning: An Introduction.
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The End