OFVF

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Abstract

This document provides a basic paper template and submission guidelines. Abstracts must be a single paragraph, ideally between 4–6 sentences long. Gross violations will trigger corrections at the camera-ready phase.

1. Introduction

We are trying to improve UCRL2 by replace the bounds by Bayesian bounds.

First, we are building a simple MDP problem using craam2.

Then, we are going to implement UCRL2 by modifying one of the algorithm in craam2.

Third, we are going to replace the bound in UCRL2 by Bayesian bounds. To generate Bayesian bounds, we generate multiple sample from the believe distribution and use the max and min in the sample set as the bounds.

Fourth, we do experiments to compare with UCRL2 and PSRL(TS approach). For example, One state MDP, chain MDP.

Fifth, once we have positive results, we are going to write proofs that prove the new bounds are guarantee to be asymptotic optimal. And we will show the new proof is simpler than the current proof of UCB convergence.

Markov decision processes (MDPs) provide a versatile methodology for modeling dynamic decision problems under uncertainty. MDPs assume that transition probabilities are known precisely, but this is rarely the case in reinforcement learning. Errors in transition probabilities often results in probabilities often results in policies that are brittle and fail in real-world deployments. The agent has to learn the true dynamics of the MDP as it optimize the performance while interacts with its environment. The key to evaluate RL algorithms is to check how they balance between exploration that gains information about unknown states (actions) and exploitation to achieve near-term performance.

OFU-RL

Posterior sampling

Our work

2. Problem formulation

3. OFVF and Bayes UCRL

4. Some shortcomings of existing UCRL2 and PSRL

5. Analysis

6. Simulation results

7. Conclusion

Acknowledgements

Do not include acknowledgements in the initial version of the paper submitted for blind review.

If a paper is accepted, the final camera-ready version can (and probably should) include acknowledgements. In this case, please place such acknowledgements in an unnumbered section at the end of the paper. Typically, this will include thanks to reviewers who gave useful comments, to colleagues who contributed to the ideas, and to funding agencies and corporate sponsors that provided financial support.

References

Langley, P. Crafting papers on machine learning. In Langley, P. (ed.), *Proceedings of the 17th International Conference on Machine Learning (ICML 2000)*, pp. 1207–1216, Stanford, CA, 2000. Morgan Kaufmann.

A. Do *not* have an appendix here

Do not put content after the references. Put anything that you might normally include after the references in a separate supplementary file.

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Preliminary work. Under review by the International Conference on Machine Learning (ICML). Do not distribute.

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