1   Introduction

To generate more scalable algorithms with higher efficiency and fewer open parameters, reinforcement learning (RL) has moved towards combining classical techniques from optimal control and dynamic programming with modern learning techniques from statistical estimation theory. In this vein, [1] suggests to use the framework of stochastic optimal control with path integrals to derive a novel approach to RL with parameterized policies. While solidly grounded in value function estimation and optimal control based on the stochastic Hamilton-JacobiBellman (HJB) equations, policy improvements can be transformed into an approximation problem of a path integral which has no open algorithmic parameters other than the exploration noise.

In the spirit of these latter ideas, this paper addresses a new method of probabilistic reinforcement learning derived from the framework of stochastic optimal control and path integrals.

Theoretical development, practical applications and important characteristics are presented in this paper, as well as related work and some main issues addressed.

2   Motivation

Besides the paper has been cited 413 times, I was motivated by the fact that it generated a new stochastic version of classical method framework using statistical estimation theory, and there's enough mathematical substances in this paper, which is exciting to readers.

3   My Plan

(a) Feb.16th $\rightarrow$ Mar.1st: 2 weeks for reading and theoretical derivation,

(b) Mar.2nd $\rightarrow$ Mar.8th: 1 week for implementation and simulation,

(c) Mar.8th $\rightarrow$ Mar.14th: 1 week for report writing and presentation.

References

[1] Theodorou, Evangelos, Jonas Buchli, and Stefan Schaal. "A generalized path integral control approach to reinforcement learning." journal of machine learning research 11.Nov (2010): 3137-3181.