CSC 449/549 — Advanced Topics in Artificial Intelligence
Deep Reinforcement Learning

Fall, 2022

Programming Assignment 3

Implement Sarsa(λ) for the Mountain Car problem as described in Sutton and Barto. Use linear function approximation with Fourier basis functions. `https://people.cs.umass.edu/~pthomas/papers/Konidaris2011a.pdf`

Write a report, and include at lesat the following:

1. Show learning curves for order 3, 5, and 7 Fourier bases, for a fixed setting of α and ϵ, and $\gamma = 1$, $\lambda = 0.9$.

2. Create a surface plot of the value function (the negative of the value function) of the learned policies after 1, 000 episodes, for the above orders. (Hint: Your plot should look like the one in Sutton and Barto, but smoother.)

3. The Mountain Car contains a negative step reward and a zero goal reward. What would happen if γ was less than 1 and the solution was many steps long? What would happen if we had a zero step cost and a positive goal reward, for the case where $\gamma = 1$, and the case where $\gamma < 1$?

Turn in your report and your code.