

Computer Science & Engineering Spring Lecture Series 2023

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Speaker: Shaofeng Zou, Associate Professor, University of Buffalo

Date: Thursday, March 23, 2023

Time: 12:00-1:00 EST

Location: UConn Library Conference Room 1102

Webex: <https://uconn-cmr.webex.com/meet/cdc19010>

Title: Robust Reinforcement Learning under Model Uncertainty

Abstract: In this talk, I will present our recent work on robust reinforcement learning (RL) under model uncertainty with fundamentals, algorithm design, convergence and complexity analysis and experimental results. RL recently has achieved great success in various benchmark tasks, e.g., beating human champions in the game of Go, achieving grandmaster level in video games and its most recent application in ChatGPT. However, existing RL approaches usually assume that a learned policy will be deployed in the same environment as the one it was trained in. Such an assumption is often violated in practice, e.g., a robot trained in a simulated environment will be deployed in a real outdoor environment (sim-to-real gap), and a policy will be deployed in an adversarial environment under potential attacks, which could lead to a significant performance degradation. Robust RL addresses this challenge through distributional robustness, i.e., optimizing the worst-case performance in the presence of distributional model uncertainty.

I will first introduce our recent results on the robust RL under the average-reward setting including the fundamentals of the robust average-reward RL and further comprehensive design and analyses for both the model-based and model-free approaches. I will then present our results for online model-free robust RL under adversarial state transition perturbation, including value-based method and policy gradient method, their convergence and complexity analyses.

Bio: Dr. Shaofeng Zou is an Assistant Professor at the Department of Electrical Engineering, University at Buffalo, the State University of New York. He received the Ph.D. degree in Electrical and Computer Engineering from Syracuse University in 2016. He received the B.E. degree (with honors) from Shanghai Jiao Tong University, Shanghai, China, in 2011. He was a postdoctoral research associate at the Coordinated Science Lab, University of Illinois at Urbana-Champaign during 2016-2018. Dr. Zou's research interests include reinforcement learning, machine learning, statistical signal processing and information theory. He received the National Science Foundation CRII award in 2019 and the 2023 AAAI Distinguished Paper Award.

