Kavosh Asadi

Education

2015-2020 Doctor of Philosophy in Computer Science, Brown University
advisor: Michael L. Littman

2013-2015 Masters in Computer Science, University of Alberta
advisor: Richard S. Sutton

2008-2013 Bachelors of Engineering, University of Tehran

Industrial Experience

2020-Present Applied Scientist at Amazon. My work at Amazon was comprised of 3 areas:

- I worked on advancing fundamental RL research. In particular, I started a research program to study the value-function-approximation problem in RL through the lens of optimization. Our efforts came into fruition by publishing multiple papers at NeurIPS about this topic.
- I focused on different applications of ML, most notably aligning large language models. This effort included developing a simple but effective rejection-sampling approach, and also rethinking and implementing various ingredients of reinforcement learning from human feedback (RLHF) such as the generalized advantage estimator in the critic module. In a different project, I focused on tackling congestion control in AWS networks using imitation learning. We explored approaches that tackle the distribution-shift problem in ML.
- I also focused on AI education where our aim was to make it easier for students and engineers to get started in RL. This effort came into frutiton by co-authoring the RL chapter of the D2L book.

2016 & 2017 Microsoft Research (MSR) Summer Internship
mentor: Jason D. Williams
At Microsoft I worked on training generative AI systems for conversational agents before it was cool! The approaches we developed could be viewed as laying the foundation of current dialog systems, but where somewhat different in that we were using the LSTM architecture (rather than Transformers), and we used sparse goal-based reward signals (rather than learning rewards from human feedback).

Technical Interests

Sequential decision making (more specifically, the reinforcement-learning problem)

Applications of reinforcement learning to large-scale problems, in particular conversational agents, and improving generative AI using human feedback

Optimization algorithms for deep reinforcement learning

Variational approaches to generative AI such as Diffusion Models and VAEs

Conference Papers

2024 Zuxin Liu, Jesse Zhang, **Kavosh Asadi**, Yao Liu, Ding Zhao, Shoham Sabach, Rasool Fakoor, "TAIL: Task-specific Adapters for Imitation Learning with Large Pretrained Models", International Conference on Learning Representations (ICLR)

2023 **Kavosh Asadi**, Shoham Sabach, Yao Liu, Omer Gottesman, Rasool Fakoor, "TD Convergence: An Optimization Perspective", Conference on Neural Information Processing Systems (NeurIPS)

2023 **Kavosh Asadi**, Rasool Fakoor, Shoham Sabach, "Resetting the Optimizer in Deep RL: An Empirical Study", Conference on Neural Information Processing Systems (NeurIPS)

2023 Omer Gottesman, **Kavosh Asadi**, Cameron Allen, Samuel Lobel, George Konidaris, Michael L. Littman, "Coarse-Grained Smoothness for Reinforcement Learning in Metric Spaces", Conference on Artificial Intelligence and Statistics (AISTATS)

2022 **Kavosh Asadi**, Rasool Fakoor, Omer Gottesman, Taesup Kim, Michael L. Littman, Alexander J. Smola, "Faster Deep Reinforcement Learning with Slower Online Network", Conference on Neural Information Processing Systems (NeurIPS)

2022 Martin Klissarov, Rasool Fakoor, Jonas Mueller, **Kavosh Asadi**, Taesup Kim, Alexander J. Smola, "Adaptive Interest for Emphatic Reinforcement Learning", Conference on Neural Information Processing Systems (NeurIPS)

2021 Rasool Fakoor, Jonas Mueller, **Kavosh Asadi**, Pratik Chaudhari, Alexander J. Smola, "Continuous Doubly Constrained Batch Reinforcement Learning", Conference on Neural Information Processing Systems (NeurIPS)

2021 **Kavosh Asadi**, Neev Parikh, Ronald E. Parr, George D. Konidaris, Michael L. Littman, "Deep Radial-basis Value Functions for Continuous Control", Conference on Artificial Intelligence (AAAI)

2021 Erwan Lecarpentier, David Abel, **Kavosh Asadi**, Yu Jinnai, Emannuel Rachelson, Michael L. Littman, "Lipschitz Lifelong Reinforcement Learning", Conference on Artificial Intelligence (AAAI)

2019 Seungchan Kim, **Kavosh Asadi**, Michael L. Littman, George D. Konidaris, "Deepmellow: Removing the Need for a Target Network in Deep Q-learning", International Joint Conference on Artificial Intelligence (IJCAI)

2019 David Abel, Dilip Arumugam, **Kavosh Asadi**, Yuu Jinnai, Michael L. Littman, Lawson LS. Wong, "State Abstraction as Compression in Apprenticeship Learning", Conference on Artificial Intelligence (AAAI)

2018 **Kavosh Asadi**, Dipendra Misra, Michael L. Littman, "Lipschitz Continuity in Model-based Reinforcement Learning", International Conference on Machine Learning (ICML)

2017 Jason D. Williams, **Kavosh Asadi**, Geoffrey Zweig, "Hybrid Code Networks: Practical and Efficient end-to-end Dialog Control with Supervised and Reinforcement Learning", Annual Meeting of the Association for Computational Linguistics (ACL)

2017 **Kavosh Asadi**, Michael L. Littman, "An Alternative Softmax Operator for Reinforcement Learning", International Conference on Machine Learning (ICML)

Book Chapter

Dive into Deep Learning. Main Authors: Aston Zhang, Zack C. Lipton, Mu Li, Alexander J. Smola. I served as a co-author for the chapter on reinforcement learning.

Notable Programming Experience

Solid experience in deep-learing libraries, especially in PyTorch. Advanced experience in Tensorflow and Keras.

Advanced experience in Cloud Computing, especially Amazon EC2

Solid experience in various programming languages, especially Python. Advanced experience in C, C++, and Java.

Hobbies

Playing classical music on the violin

Watching the English Premier League soccer

Physical activities, in particular snorkeling, hiking, jogging, and rock climbing