Hao Qin

Ph.D. Candidate at the University of Arizona

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[Personal Website](#)   [GitHub](#)

EDUCATION

University of Arizona
Tucson, AZ, United States
Ph.D. Candidate in Statistics (Advised by Dr. [Chicheng Zhang](#), Grade: 4.0/4.0)
Aug. 2020 - Present

University of Wisconsin-Madison
Madison, WI, United States
M.S. in Statistics (Grade: 3.78/4.0)
Sept. 2018 - May 2020

Shandong University
Jinan, Shandong, P. R. China
B.S. in Mathematics (Grade: 91.6/100)
Sept. 2014 - Jun. 2018

RESEARCH EXPERIENCE

Research Assistant, University of Arizona
Tucson, AZ
Under the supervision of Dr. Chicheng Zhang
Aug. 2020 - Present

- **Inverse Reinforcement Learning**
  - Developed a robust reinforcement learning framework for robotic control, proposing an adaptive algorithm that handles varying initial system states.
  - Designed efficient inverse reinforcement learning methods that incorporate contextual and domain-shift information to enhance generalization across related tasks and environments.
  - Performed a finite-sample complexity analysis of the Maximum Entropy Inverse Reinforcement Learning (MaxEnt-IRL) algorithm, providing theoretical guarantees.
  - Conducted extensive GPU-accelerated experiments, delivering a comprehensive empirical evaluation of proposed methods.

- **Contextual Bandit**
  - Developed efficient contextual bandit algorithms for large action spaces.
  - Leveraged offline regression oracles to address scalability on large action spaces and improve learning efficiency.
  - Established theoretical guarantees with the best-known smooth regret bounds in the literature.

- **Multi-armed Bandits**
  - Developed the *Kullback–Leibler Maillard Sampling* (KL-MS) algorithm for the k-armed bandit with exponential distributions reward.
  - Proved that KL-MS achieves asymptotic optimality, Sub-UCB criterion and adaptive variance, with superior empirical performance across benchmark tasks.
  - Established unbiased off-policy evaluation for multi-armed bandits using the KL-MS framework.

WORKING EXPERIENCE

- **Statistical Consultant, University of Arizona**
  Sept. 2023 - Jul. 2024, Tucson, AZ
  Provided professional statistical advice and support to collaborative healthcare labs and biological research labs. Analyzed high-dimensional time series data and helped with the interpretation of results. Contributed to

- **Amazon Applied Scientist Intern**
  Jul. - Sept. 2024, Seattle, WA
  Developed a personalized email preference optimization system for Amazon Business using contextual bandits. Led the design and implementation of the first personalized recommendation framework for email delivery, improving customer engagement by identifying and serving content most likely to increase click-through rates.

TEACHING EXPERIENCE

Graduate Assistant, University of Arizona
Tucson, AZ
Teaching Assistant - Math 263, CSC 352, Math 571B, Data 474
2021 - 2025

PUBLICATIONS

- **Qin, H.**, Jun, K.S., Zhang, C.(2023). Kullback-Leibler Maillard Sampling for Multi-armed Bandits with Bounded Rewards, *Advances in Neural Information Processing Systems, 36.*

- **Qin, H.**, Jun, K.S., Zhang, C.(2025). Achieving adaptivity and optimality for multi-armed bandits using Exponential-Kullback Leiblier Maillard Sampling, *(In submission to The 37th International Conference on Algorithmic Learning Theory.*

- **Qin, H.**, Doung, T., Li, M., Zhang, C.(2025) Physics-Informed Parametric Bandits for Beam Alignment in mmWave Communications, *(In submission to IEEE International Conference on Computer Communications 2026)*

- Qi, Z., Li, H., **Qin, H.**, Peng, K., He, S., Qin, X., (2025) Harnessing Large Language Model for Virtual Reality Exploration Testing: A Case Study, *Automated Software Engineering, 33.*

SERVICES

- Served as a reviewer for NeurIPS, ICML, ICLR, AAAI, AISTATS, and ACM Transactions on Probabilistic Machine Learning for years.

AWARD AND HONORS

- NeurIPS 2023 Travel Grants, Carter Travel Award 2023, NeurIPS 2024 Travel Grants.