Bahram Behzadian

Reinforcement learning for reasoning, planning, and long-horizon decision-making

Menlo Park, CA
buiksat@gmail.com
buiksat.github.io
buiksat

Research Statement

I study reinforcement learning and sequential decision-making, with a focus on reasoning, planning, and long-horizon decision problems. My research studies learning under uncertainty and partial observability, with an emphasis on robust Markov decision processes and stable value- and policy-iteration–style methods. I am interested in how learning dynamics and representation interact with planning to produce reliable behavior in complex environments.

Publications

Selected Publications

Fast Algorithms for L_∞-Constrained S-Rectangular Robust MDPs.
Neural Information Processing Systems (NeurIPS), 2021.
Scalable algorithms for robust policy computation under structured uncertainty.

Optimizing Percentile Criterion using Robust MDPs.
International Conference on Artificial Intelligence and Statistics (AISTATS), 2021.
Robust decision-making under risk-sensitive and quantile-based objectives.

Fast Feature Selection for Linear Value Function Approximation.
International Conference on Automated Planning and Scheduling (ICAPS), 2019.
Representation and feature selection methods for value-based reinforcement learning.

Monte Carlo Localization in Hand-Drawn Maps.
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2015.
State estimation under partial observability with nonstandard, noisy map representations.

Other Publications and Workshops

Robot Navigation in Hand-Drawn Sketched Maps. *European Conference on Mobile Robotics (ECMR)*, 2015.

Optimizing Norm-Bounded Weighted Ambiguity Sets for Robust MDPs.
NeurIPS Workshop on Safety and Robustness in Decision-Making, 2019.

Feature Selection by Singular Value Decomposition for Reinforcement Learning.
ICML Workshop on Prediction and Generative Modeling, 2018.

Low-Rank Feature Selection for Reinforcement Learning.
International Symposium on Artificial Intelligence and Mathematics (ISAIM), 2018.

Experience

2022–Present **Research Scientist**, *Meta*, Menlo Park, CA
- Research on online learning and sequential decision-making systems under partial observability, including missing and delayed feedback.
- Developed statistically grounded learning and evaluation frameworks to improve stability and reliability of large-scale learning systems.

2018 **AI Engineer Intern**, *Envio, Inc.*, Dover, NH
- Developed learning-based approaches for vehicle routing and scheduling as constrained sequential decision-making problems.
- Addressed combinatorial planning, uncertainty in execution, and long-horizon trade-offs in logistics optimization.

Education

2019–2022 **Ph.D. in Computer Science**, *University of New Hampshire*
Dissertation: *Efficient Data-Driven Robust Policies for Reinforcement Learning*

2015–2019 **M.S. in Computer Science**, *University of New Hampshire*
Master's Thesis: *Representation Learning for Reinforcement Learning via Singular Value Decomposition*

2010–2013 **M.S. in Machine Automation**, *Tampere University*
Master's Thesis: *Robot Localization under Partial Observability with Weak Maps*

Honors and Fellowships

CEPS Graduate Fellowship, University of New Hampshire

Thesis and Dissertation Fellowship, Tampere University of Technology

Skills

Reinforcement Learning; Sequential Decision-Making; Planning and Reasoning; Long-Horizon Credit Assignment; Robust Markov Decision Processes; Learning under Uncertainty; Partial Observability; Policy Iteration and Value-Based Methods