Payam Parvizi

Postdoctoral Research Associate | Applied RL & Control

Ontario, Canada | (+1) 613-606-5842 | pparv056@uottawa.ca | linkedin.com/in/PayamParvizi | github.com/payamparvizi

Professional Summary

PhD-trained Postdoctoral Research Associate with 4+ years of experience developing and validating reinforcement learning methods for continuous control problems with real-world-motivated constraints. Specializing in continuous control and policy regularization to achieve smooth, stable behavior in learning-based systems. Proven track record in building custom Gymnasium-compatible environments and simulation-to-real transfer, including deployment on a quadcopter platform. Research conducted at the University of Ottawa in collaboration with the National Research Council of Canada (NRC).

Core Skills

Applied ML & decision systems	Reinforcement learning (PPO, SAC, TD3, DDPG), policy regularization, robustness & stability evaluation
Control Systems	Continuous control, learning-based control, system dynamics, classical control (PID, lead/lag)
Programming	Python, PyTorch, JAX (XLA GPU backend), TensorFlow, Bash, MATLAB/Simulink
Systems & infrastructure	Linux/Ubuntu, HPC/SLURM (Compute Canada), GPU-accelerated training, Git
Simulation & tooling	MuJoCo, Gymnasium, DM-Control, custom RL environment design, Tianshou, Weights & Biases (W&B)

Work Experience

Postdoctoral Research Associate — *Ottawa, Canada*

University of Ottawa — *Nov. 2025 – Present*

- Develop action/policy regularization methods to improve smoothness and stability of learned policies in continuous-control settings.
- Prototype and evaluate RL methods in GPU-accelerated simulation workflows using PyTorch and JAX (MuJoCo-based environments).
- Run controlled empirical studies to analyze temporal behavior, robustness, and reliability across changing conditions.

Research Assistant — *Ottawa, Canada*

University of Ottawa & National Research Council of Canada (NRC) — *Apr. 2022 – Sept. 2025*

- Designed and implemented the first Gymnasium-compatible RL environment in our project for wavefront sensorless adaptive optics (WSL-AO).
- Developed and validated model-free RL controllers for wavefront correction in satellite-to-ground optical communication scenarios.
- Developed action-regularized RL methods to reduce high-frequency oscillations and improve policy smoothness in complex environments.
- Transferred RL policies from simulation to a quadcopter platform via simulation-to-real transfer, targeting smooth and stable control.

Project Assistant — *Ankara, Turkey*

Middle East Technical University & TÜBİTAK — *Nov. 2015 – Nov. 2017*

- Modeled human motor skills and transferred motion primitives to robotic platforms (hexapod, ABB manipulator).
- Supported process modeling and experimental validation for a high-precision robotic deburring system.

Education

PhD in Applied Science (Mechanical Engineering) — *Ottawa, Canada*

University of Ottawa — *Sep. 2018 – Oct. 2025*

Thesis: Adaptive Policy Smoothing in Reinforcement Learning: Applications to Wavefront Sensorless Adaptive Optics and Robotics [Link]

Master of Applied Science (Mechanical Engineering) — *Ankara, Turkey*

Middle East Technical University — *Feb. 2015 – Jan. 2018*

Selected Publications

Adaptive Policy Regularization for Smooth Control in Reinforcement Learning

Payam Parvizi, Abhishek Naik, Colin Bellinger, Ross Cheriton, Davide Spinello

Submitted to IEEE Transactions on Automation Science and Engineering, Preprint available at TechRxiv, 2026 [Link]

Action-Regularized Reinforcement Learning for Adaptive Optics in Optical Satellite Communication

Payam Parvizi, Colin Bellinger, Ross Cheriton, Abhishek Naik, Davide Spinello

In final production at Journal of the Optical Society of America B (Optica). Preprint available at Optica Open, 2025 [Link]

Reinforcement Learning Environment for Wavefront Sensorless Adaptive Optics in Single-Mode Fiber Coupled Optical Satellite Communications Downlinks

Payam Parvizi, Runnan Zou, Colin Bellinger, Ross Cheriton, Davide Spinello

Photonics, 2023 [Link]