Milad Farjad

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SUMMARY

Multi-Agent Reinforcement Learning & Robotics Specialist with 5+ years of experience in *Deep Reinforcement Learning* applied to *Heterogeneous Multi-Robot Systems*. Expertise covers the full stack: from designing transformer-based policy networks and hyperparameter fine-tuning to deploying real-time control and motion planning solutions using *Python*, *PyTorch*, *C++*, *ROS*, and *MATLAB*. Published researcher in optimal control and multi-robot coordination.

EXPERIENCE

Robotics and AI PhD Researcher
May 2021 - Present

McMaster University, Hamilton, ON

- **Scalable Multi-Agent Frameworks:** Developed a transformer-based deep reinforcement learning framework for distributed cooperative planning, enabling asynchronous decision-making across heterogeneous-agent teams.

- **Advanced Memory Architectures:** Engineered a mixed-memory neural network system combining Liquid Neural Networks and LSTMs to integrate robust continuous-time memory capabilities, significantly enhancing performance in asynchronous decision-making in complex, map-denied environments.

- **LLM Integration:** Researched and implemented methods to ground pre-trained Large Language Models using Multi-Agent Reinforcement Learning, enabling agents to interpret and navigate unstructured environments.

Skills: Python, PyTorch, CUDA, ROS, Linux, Git, Docker, NVIDIA Isaac Sim, Neural Networks, Transformer Models, Deep Reinforcement Learning, Multi-Agent Reinforcement Learning, Large Language Models, Computer Vision, Motion Planning, Robotic Perception, System Design, Recurrent Neural Networks

Teaching Assistant and Mentorship
Sep 2021 - Present

McMaster University, Hamilton, ON

Autonomous Electrified Vehicle System Engineering:

- **Curriculum Development:** Co-developed interdisciplinary course material focusing on control systems, electric machines, drive systems, programming, signal processing, and optimization towards developing a self-driving vehicle.

- **Technical Mentorship:** Led technical lab sessions on sensing, planning, control and SLAM modules for a vehicle platform powered by NVIDIA Jetson Nano, providing hands-on instructions in Linux OS, ROS, C++, Python, and hardware integration (LIDAR, RGB-D Camera, IMU, wheel encoders, electric motors).

Control Theory & System Design:

- Directed lab sessions on system identification and controller implementation, utilizing MATLAB and Simulink to demonstrate the practical application of theoretical models on the Quanser QUBE™-Servo 2 platform.

- Mentored students through the full project lifecycle, translating complex theoretical concepts into actionable solutions and resolving technical implementation challenges.

Undergraduate Research Programs:

- Collaborated with undergraduate students on diverse research projects, providing mentorship, facilitation and technical guidance.
    - Integration of LIDAR and RGB-D cameras for effective obstacle detection in dynamic environments.
    - Applying MARL to multi-robot navigation and collaborative-SLAM in 3D simulation environments.

Skills: ROS, ROS 2, Python, C++, Gazebo, MATLAB & Simulink, Isaac Sim, SLAM, C-SLAM, Sensor Integration, Control Theory, Electrical Motors, Autonomous Vehicles

Distributed Control Researcher
Sep 2018 – Apr 2020

Sharif University of Technology, Tehran, Iran

- Developed a non-iterative method for designing model-free LQR controllers for distributed systems based on convex optimization, improving the convergence time by an order of magnitude over AI-driven iterative methods.

Skills: MATLAB, LaTeX, Convex Optimization, Optimal Control, Reinforcement Learning

EDUCATION

PhD in Electrical and Computer Engineering, GPA: 3.97/4.0   May 2021 - Present
McMaster University, Hamilton, ON
- *Awarded* Department Chair's Commendation for Excellent 3-Minute-Thesis Presentation, Jan 2024
- *Relevant Courses*: Machine Learning, Nonlinear Control

Master of Science in Electrical Engineering, Control Major, GPA: 4.0/4.0   Aug 2018 – Apr 2020
Sharif University of Technology, Tehran, Iran
- *Relevant Courses*: Adaptive Control, Introduction to Machine Learning, Multivariable Control Systems, Robust Control

Bachelor of Science in Electrical Engineering, GPA: 3.47/4.0   Aug 2013 – Dec 2017
Sharif University of Technology, Tehran, Iran
- *Finalist* in Sharif's Electrical Engineering Department's Distinguished BSc Thesis Awards, Jan 2018
- *Relevant Courses*: Linear Algebra, Introduction to Robot Control, Nonlinear Systems

PUBLICATIONS

- Farjadnasab, M., & Babazadeh, M. (2022). Model-free LQR design by Q-function learning. Automatica, 137, 110060.

- Farjadnasab, M., & Sirouspour, S. (2025). Cooperative and Asynchronous Transformer-based Mission Planning for Heterogeneous Teams of Mobile Robots. Robotics and Autonomous Systems, 194, 105131.

LANGUAGES

- **English**, Full Professional Proficiency

- **Persian**, Native Proficiency

- **French**, Elementary Proficiency

INTERESTS AND EXTRACURRICULAR ACTIVITIES

- **Translation** - Published translations of books and other media from English to Persian for 10 years.

- **Teaching** - Taught English as a second language to school children.

- **Music** - Plays bass guitar in a rock band.