

# Milad Farjad

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## SUMMARY

*MARL & 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

<b>Robotics and AI PhD Researcher</b> <i>McMaster University, Hamilton, ON</i>	May 2021 - Present
<ul style="list-style-type: none"><li>Developed a transformer-based multi-agent deep reinforcement learning framework for distributed cooperative mission planning of a heterogeneous team of mobile robots, enabling asynchronous and scalable cooperation among robotic teams.</li><li>Worked on enabling mapless exploration and navigation for cooperative multi-robot systems by grounding pretrained large language models using multi-agent deep reinforcement learning.</li><li>Developed a framework for mapless target-driven navigation of heterogeneous multi-robot systems by integrating continuous-time memory into a transformer-based policy network.</li></ul> <p><b>Skills:</b> 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</p>	
<b>Teaching Assistant and Mentorship</b> <i>McMaster University, Hamilton, ON</i>	Sep 2021 - Present
<p><b>Autonomous Electrified Vehicle System Engineering:</b></p> <ul style="list-style-type: none"><li>Co-developed the course curriculum, integrating interdisciplinary knowledge from electric machines, drive systems, control systems, programming, signal processing, and optimization towards developing a self-driving vehicle.</li><li>Led lab sessions focusing on the development of sensing, planning, control and SLAM modules for a vehicle platform powered by NVIDIA Jetson Nano, providing practical instructions in Linux OS, ROS, C++, Python, and hardware integration (LIDAR, RGB-D Camera, IMU, wheel encoders, electric motors).</li></ul> <p><b>Control Systems Design:</b></p> <ul style="list-style-type: none"><li>Instructed and facilitated lab sessions for system identification and controller implementation using the Quanser QUBE™-Servo 2 platform, emphasizing control theory applications with MATLAB and Simulink.</li><li>Addressed students' queries and supported them through both the theoretical concepts and practical challenges encountered in the course projects.</li></ul> <p><b>Undergraduate Research Programs:</b></p> <ul style="list-style-type: none"><li>Collaborated with four undergraduate students on diverse research projects, providing mentorship, facilitation and technical guidance.<ul style="list-style-type: none"><li>Integration of LIDAR and RGB-D cameras for effective obstacle detection in dynamic environments.</li><li>Combining multi-robot navigation and collaborative-SLAM with MARL in 3D simulation environments.</li></ul></li></ul>	
<b>Distributed Control Researcher</b> <i>Sharif University of Technology, Tehran, Iran</i>	Sep 2018 – Apr 2020
<ul style="list-style-type: none"><li>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.</li></ul> <p><b>Skills:</b> MATLAB, LaTeX, Convex Optimization, Optimal Control, Reinforcement Learning</p>	

## EDUCATION

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<b>PhD in Electrical and Computer Engineering, GPA: 3.97/4.0</b> <i>McMaster University, Hamilton, ON</i>	May 2021 - Present
<ul style="list-style-type: none"><li>• Awarded Department Chair's Commendation for Excellent 3-Minute-Thesis Presentation, Jan 2024</li><li>• Relevant Courses: Machine Learning, Nonlinear Control</li></ul>	
<b>Master of Science in Electrical Engineering, Control Major, GPA: 4.0/4.0</b> <i>Sharif University of Technology, Tehran, Iran</i>	Aug 2018 – Apr 2020
<ul style="list-style-type: none"><li>• Relevant Courses: Adaptive Control, Introduction to Machine Learning, Multivariable Control Systems, Robust Control</li></ul>	
<b>Bachelor of Science in Electrical Engineering, GPA: 3.47/4.0</b> <i>Sharif University of Technology, Tehran, Iran</i>	Aug 2013 – Dec 2017
<ul style="list-style-type: none"><li>• Finalist in Sharif's Electrical Engineering Department's Distinguished BSc Thesis Awards, Jan 2018</li><li>• Relevant Courses: Linear Algebra, Introduction to Robot Control, Nonlinear Systems</li></ul>	

## PUBLICATIONS

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- Farjadnasab, M., & Babazadeh, M. (2022). Model-free LQR design by Q-function learning. *Automatica*, 137, 110060.
- Farjadnasab, M., & Sorouspour, S. (2025). Cooperative and Asynchronous Transformer-based Mission Planning for Heterogeneous Teams of Mobile Robots. *Robotics and Autonomous Systems*, 194, 105131.

## LANGUAGES

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- **English**, Full Professional Proficiency
- **Persian**, Native Proficiency
- **French**, Elementary Proficiency

## INTERESTS AND EXTRACURRICULAR ACTIVITIES

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- **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.