Iman Sharifi

PhD Candidate in Mechanical and Aerospace Engineering
George Washington University, Washington DC, USA
i.sharifi@gwu.edu

+1 571 302 2783
Website
LinkedIn
Google Scholar

Research Interests

My research lies at the intersection of neuro-symbolic artificial intelligence, multi-agent reinforcement learning, and large language model fine-tuning for safety-critical autonomous systems. My current focuses are (1) safety, efficiency, and scalability of multi-agent autonomy through interpretable and learning-based decision-making; (2) autonomous transportation applications including air traffic control, UAS traffic management (UTM), advanced air mobility (AAM), and autonomous driving; and (3) AI safety and human-aligned learning, with emphasis on interpretable policies, robustness, and deployable fine-tuning of LLMs for high-level decision support.

Education

George Washington University — *Sep 2024 – Present*
Doctor of Philosophy in Mechanical and Aerospace Engineering — Washington, DC, USA
Research Areas: *Multi-Agent Reinforcement Learning, Neuro-Symbolic AI, Generative AI* — GPA: 4.0 / 4.0
PhD Advisor: *Dr. Peng Wei*

Sharif University of Technology — *Sep 2019 – Mar 2022*
Master of Science in Mechanical Engineering — Tehran, Iran
Research Areas: *Reinforcement Learning, Computer Vision, Robotics, Dynamics & Control* — GPA: 4.0 / 4.0

K. N. Toosi University of Technology — *Sep 2015 – Sep 2019*
Bachelor of Science in Aerospace Engineering — Tehran, Iran
Relevant Courses: *Flight Dynamics & Control, Control & Navigation, Automatic Control*

Experience

Visiting Student Researcher — *Jun 2026 – Sep 2026*
Stanford University, Stanford Intelligent Systems Laboratory (SISL), Stanford, CA

- To develop a *neuro-symbolic safegaurd framework* to shield unsafe actions taken by large language models (LLMs) using retrieval-augmented generations (RAGs) for aviation applications.

Research Assistant — *Sep 2024 – Present*
George Washington University, Intelligent Autonomous Systems Lab (IASL), Washington DC, USA

- *Fine-tuned LLMs using parameter-efficient supervised fine-tuning and group-relative policy optimization (GRPO) on human-aligned tactical deconfliction datasets* to improve the overall safety and efficiency of pretrained LLMs in small unmanned aerial systems. The paper has been accepted at the *Proceedings of CVPR Workshops, 2026.*
- Developed a *multi-agent reinforcement learning framework for heterogeneous agents with different aircraft performance, sensing capabilities, and control policies.* This project is funded by *NASA*, and the paper has been accepted at *ITSC, 2026.*
- Designed and developed a novel *attention-based neurosymbolic differentiable rule extractor* to learn logical rules on a novel *continuous rule space* using *attention-based conjunction and disjunction operators* and a new *curriculum learning.* The paper is under review at *NeSy, 2026.*

Visiting Student Researcher — *Jan 2023 – Dec 2023*
University of Surrey, Connected and Automated Vehicles Lab (CAV-Lab), Guildford, UK

- Developed a safe *neuro-symbolic reinforcement learning* framework based on symbolic logic programming for autonomous driving systems. Published at *TRR.*
- Developed a *symbolic imitation learning* strategy using inductive logic programming to learn human-like behavioral rules in highway driving. Published at *Applied Sciences.*

Research Assistant — *Sep 2019 – Mar 2022*
Sharif University of Technology, Control Lab, Tehran, Iran

- Developed a novel *self-tuning PID controller using hybrid actor-critic neural networks* for quadcopters. Published at the *ISME* conference.

Teaching Assistant — *Sep 2019 – Mar 2022*
Sharif University of Technology, Department of Mechanical Engineering, Tehran, Iran

- Assisted in graduate courses: *Fuzzy Systems & Control*, *Advanced Applied Mathematics*; and undergraduate courses: *Automatic Control*, *Differential Equations.*

Publications

I. Sharifi, A. Zongo, P. Wei, "Fine-Tuning Large Language Models for Autonomous Tactical Deconfliction of Small Unmanned Aerial Systems," *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, Denver, Colorado, USA, 2026.

I. Sharifi, H. T. Kim, M. H. Ahmed, M. Ghasemi, P. Wei, "Separation Assurance between Heterogeneous Fleets of Small Unmanned Aerial Systems via Multi-Agent Reinforcement Learning," *IEEE International Conference on Intelligent Transportation Systems (ITSC)*, Naples, Italy, 2026.

Vinal Asodia, **I. Sharifi**, S. Fallah, "Reinforcement Learning Enhancement Using Vector Semantic Representation and Symbolic Reasoning for Human-Centered Autonomous Emergency Braking," under review at *IEEE Transactions on Intelligent Transportation Systems*, 2026.

I. Sharifi, P. Wei, S. Fallah, "ANDRE: An Attention-based Neurosymbolic Differentiable Rule Extractor," to be submitted to the *20th Conference on Neurosymbolic Learning and Reasoning (NeSy 2026)*, Lisbon, Portugal, 2026.

M. Ghazanfari, **I. Sharifi**, A. Taye, P. Wei, G. Biswas, B. Ward, X. Koutsoukos, M. Ghasemi, V. Gupta, A. Chen, A. Shirkhodaei, S. Hasan, I. Amundson, F. Fotiadis, U. Topcu, et al., "A Survey of Security Challenges and Solutions for Advanced Air Mobility and eVTOL Aircraft," *AIAA SciTech Forum*, Orlando, Florida, 2026.

I. Sharifi, M. Ghazanfari, A. Taye, P. Wei, G. Biswas, B. Ward, X. Koutsoukos, M. Ghasemi, V. Gupta, A. Chen, A. Shirkhodaei, S. Hasan, I. Amundson, F. Fotiadis, U. Topcu, et al., "A Survey of Security Challenges and Solutions for UAS Traffic Management (UTM) and small Unmanned Aerial Systems (sUAS)," *AIAA SciTech Forum*, Orlando, Florida, 2026.

I. Sharifi, M. Yildirim, S. Fallah, "Symbolic Imitation Learnig: From Black-Box to Explainable Driving Policies," *Applied Sciences, Special Issue on Intelligent Vehicle Collaboration and Positioning*, 2025.

K. Acharya, **I. Sharifi**, M. Lad, L. Sun, H. H. Song, "Integrating Neurosymbolic AI in Advanced Air Mobility: A Comprehensive Survey," *Proceedings of the Thirty-Fourth International Joint Conference on Artificial Intelligence (IJCAI)*, 2025.

A. Talaeizadeh, **I. Sharifi**, Shirin Gh. Samani, A. Alasty, "Agricultural Spraying Drones: A Comprehensive Review," *Smart Agricultural Technology*, 2025.

I. Sharifi, M. Yildirim, S. Fallah, "Towards Safe Autonomous Highway Driving Policies using a Neuro-Symbolic Deep Reinforcement Learning Approach," *Transportation Research Record (TRR)*, 2025.

I. Sharifi, A. Alasty, "Self-Tuning PID Control via a Hybrid Actor-Critic-Based Neural Structure for Quadcopter Control," *30th Annual International Conference of Iranian Society of Mechanical Engineers (ISME)*, Tehran, Iran, 2022.

Peer Reviews

Journal Reviews:

- *Journal of Aerospace Information Systems* (2 papers, 2025).

Conference Reviews:

- *Association for the Advancement of Artificial Intelligence (AAAI) Conference* (4 papers, 2025).
- *IEEE International Conference on Intelligent Transportation Systems (ITSC)* (2 papers, 2026).

Graduate Courses (Grade)

Machine Learning (A)	Deep Reinforcement Learning (A)	Large Language Vision Models (A)
Computer Vision (A)	Nonlinear Control (A)	Advanced Mathematics (A)
Advanced Control (A)	Advanced Dynamics (A)	Fuzzy Systems & Control (A)
Control Systems Design (A)	Electro-Mechanical Control Systems (A)	

Technical Skills

Programming	Python, Jupyter Notebook, MATLAB/SIMULINK, Prolog, ProbLog
Libraries	Numpy, Matplotlib, Pandas, Pygame, Scikit-Learn, PyTorch, OpenCV
Tools	GIT, GITHUB, VS-Code, PyCharm, VirtualEnv, Linux Ubuntu, LaTeX
CAD	SOLIDWORKS

Achievements

Master's GPA Distinction *Mar 2022*
Ranked among the top three graduate students in Dynamics & Control at Sharif University of Technology.

Bachelor's Thesis Award *Nov 2019*
Recognized as the top Bachelor's thesis by the Iranian Aerospace Association.

National Entrance Exam Distinction *2015, 2019*
Ranked among the top 1% of students nationwide in the Iranian Master's and Bachelor's entrance examinations.

References

Dr. Peng Wei
Associate Professor, Department of Mechanical and Aerospace Engineering
George Washington University, Washington, DC, USA
pwei@gwu.edu

Prof. Saber Fallah
Professor, Department of Mechanical Engineering Sciences
University of Surrey, Guildford, UK
s.fallah@surrey.ac.uk