

Ali BaniAsad

Curriculum Vitae

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EDUCATION

M.S. Aerospace Engineering
Sharif University of Technology

Sep. 2022 – Apr. 2025

B.S. Aerospace Engineering
Sharif University of Technology
Upper-division GPA: 3.72/4.00

Sep. 2017 – May 2022

RESEARCH INTERESTS

- Reinforcement Learning
- Robotics
- Multi-Agent Systems
- Automatic Control
- Game Theory
- Embedded ML

PUBLICATIONS

Journal Papers

- A. Sharifi, **A. BaniAsad**, and S. Mozafari, “Applied an in-motion transfer alignment approach during global positioning system outages utilizing a recurrent neural network algorithm,” *Engineering Applications of Artificial Intelligence*, vol. 157, pp. 111167, 2025, doi: 10.1016/j.engappai.2025.111167.
- **A. BaniAsad**, et al., “Attitude Control of a 3-DoF Quadrotor Platform Using a Linear Quadratic Integral Differential Game Approach,” *ISA Transactions*, vol. 148, pp. 515-527, 2024, doi: 10.1016/j.isatra.2024.03.005.

Conference Papers

- **A. BaniAsad** and H. Nobahari, “Robust DDPG Reinforcement Learning Differential Game Guidance in Low-Thrust, Multi-Body Dynamical Environments,” in *Proc. of 23rd International Conference of Iranian Aerospace Society*, 2025 ([Proceedings entry](#)) ([Project Repo \(Code, Report, and Presentation\) on GitHub](#)).
- M. Amirpour, **A. BaniAsad**, and H. Nobahari, “Reinforcement Learning-Based Controller Design for a Suspended Ball Plant,” in *Proc. of 23rd International Conference of Iranian Aerospace Society*, 2025 ([Proceedings entry](#)) ([Report](#)).
- H. Nobahari, **A. BaniAsad**, and A. Sharifi, “Linear Quadratic Integral Differential Game applied to the Real-time Control of a Quadrotor Experimental setup,” *Proc. of 2022 10th RSI International Conference on Robotics and Mechatronics (ICRoM)*, 2022, pp. 578-583, doi: 10.1109/ICRoM57054.2022.10025263.

Preprints and Under Review

- **A. BaniAsad**, H. Nobahari, “Robustness on Demand: Transformer-Directed Switching in Multi-Agent RL,” (in preparation), 2025.
- R. Pordal, A. Sharifi, and **A. BaniAsad**, “Ellipsoidal Set-Theoretic Design of Robust Safety Filters for Constrained Linear Systems,” arXiv: 2510.22790 [eess.SY], 2025. (preprint)

PROFESSIONAL EXPERIENCE

Work Experience

Robotic Engineer at Fasta Robotics fasta.technology 	Oct. 2024 – Present
<i>Multi-Rotor Autopilot & Control Systems Development</i>	Tehran, Iran
<ul style="list-style-type: none">• Designed autopilot control loops with embedded RL; improved trajectory tracking.• Developed guidance/navigation algorithms with embedded ML fusing GPS/IMU data.• Conducted flight dynamics simulation and analysis using Isaac Sim and PyBullet.• Implemented real-time control software in C/C++ and Python with ROS 2.• Participated in system integration, laboratory and field testing to validate performance.• Applied flight mechanics and robust control to enhance autopilot stability under disturbances.	

Academic Research

Embedded RL Control for Robots 	Aug. 2022 – Apr. 2025
<i>Master's Thesis in Sharif University of Technology</i>	Tehran, Iran
Supervisors: Nobahari Hadi, PhD	
<ul style="list-style-type: none">• Designed zero-sum, disturbance-augmented training; policies stable under $10\times$ perturbations.• Built 15k LOC RL stack (DDPG, TD3, SAC, PPO) in PyTorch/TensorFlow+Gym.• Optimized neural networks via quantization for resource-constrained hardware.• Validated robustness on Gymnasium tasks: Ant, Humanoid, HalfCheetah, Walker2d.• Ported system to C++/Python ROS 2 node for hardware-in-the-loop testing.	

Researcher at CNAV Lab   	May 2020 – Feb. 2025
<i>Head of Lab (Former)</i>	Tehran, Iran
Supervisors: Nobahari Hadi, PhD and Sharifi Alireza, PhD	
<ul style="list-style-type: none">• Led embedded AI (C) and RL projects for robotic control and navigation.• Developed LSTM-MLP for GPS-denied INS alignment; $< 0.1\%$ drift vs Kalman-INS. 	

Game Theory-Based Control for 3-DoF Platform  	Feb. 2021 – Sep. 2023
<i>Bachelor's Thesis — Sharif University of Technology</i>	Best Thesis Award 
Supervisor: Nobahari Hadi, PhD	
<ul style="list-style-type: none">• Designed LQI differential-game controller; outperformed ADRC/DOBC in robustness.• Deployed via MATLAB/Simulink-to-C pipeline for real-time 3-DoF quadcopter control.	

TEACHING EXPERIENCE

Section Leader — Stanford University	Apr. 2025 – June 2025
<ul style="list-style-type: none">• Code in Place (CS106A) verify• Mentor 10 international learners in Python.	
Teaching Assistant — Sharif University of Technology	
Sep. 2018 – Present	
<ul style="list-style-type: none">• Automatic Control (2021 – Present), Control Lab (2022 – Present), Dynamics (2023), Aircraft Design II (Fall 2021), Fundamentals of Programming C/C++ (Fall 2018)	
Community Outreach	
Sep. 2020 – Dec. 2021	
<ul style="list-style-type: none">• University Entrance-Exam Preparation, Virgil Charity.	

AWARDS AND HONORS

- Best Undergraduate Thesis — Iranian Aerospace Society 2023
“Control of a 3-DOF Quadrotor Stand via LQI & Differential Game Theory”
- National M.Sc. Entrance Exam (Aerospace) — Rank 23 / 1 000+ 2022
- National B.Sc. Entrance Exam — Top 0.5 % of 150 000 2017
- NODET — National Organization for Development of Exceptional Talents 2010–2017

TECHNICAL SKILLS

- Programming Languages:

- C/C++
- Embedded C
- MATLAB
- Python

- Tools and OS:

- Git 
- ROS
- Terminal 
- Linux 
- Simulink
- LATEX

- Libraries/Frameworks:

- Machine Learning Libraries:
PyTorch, TensorFlow, Keras, Scikit-learn, OpenCV, OpenAI Gym, JAX
- Data Analysis and Visualization Libraries:
Matplotlib, NumPy, Pandas, Seaborn, Plotly
- Simulation Tools: Isaac Sim, MuJoCo, PyBullet, Gazebo

- Languages: Farsi (Native), English (Full Professional Proficiency)

The TOEFL iBT score is 96 (Reading: 26, Listening: 27, Speaking: 22, Writing: 21)

NOTABLE COURSES

Selected University Courses 2017–2024

- Programming & Numerics: Basic C Programming (20/20), Numerical Calculations (20/20)
- Math & Statistics: Engineering Mathematics (19.8/20), Probability & Statistics (20/20)
- Control Systems: Automatic Control (18.1), Control Lab (18.5/20), Optimal Control (17.5/20)
- Aerospace Engineering: Aircraft Design II (18.3/20), Flight Dynamics II (18.3/20)
- Research: B.Sc. Thesis (20/20)

Online Courses 2017–2024

- Robotics Specialization — Univ. of Pennsylvania (6 courses) [verify](#)
- Reinforcement Learning Specialization — Univ. of Alberta (4 courses) [verify](#)
- AI Engineering Pro-Cert — IBM (6 courses)
- Accelerated Computing with CUDA Python — NVIDIA
- Neural Networks & Deep Learning — deeplearning.ai [verify](#)
- Python Data Structures — Univ. of Michigan [verify](#)
- Intro to Embedded Machine Learning — Edge Impulse [verify](#)
- Game Theory — Stanford University [verify](#)

REFERENCES

- **Dr. Hadi Nobahari**
Professor, Sharif University of Technology, Department of Aerospace Engineering
Email: nobahari@sharif.ir
- **Dr. Nima Assadian**
Research Associate, University of Toronto, Institute for Aerospace Studies (UTIAS)
Email: nima.assadian@utoronto.ca
- **Dr. Alireza Sharifi**
Assistant Professor, Sharif University of Technology, Department of Aerospace Engineering
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