

# 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. 2025 – Present  
*Multi-Rotor Autopilot & Control Systems Development* Tehran, Iran

- Designed autopilot control loops with embedded RL and developed guidance/navigation algorithms with embedded ML fusing GPS/IMU data, improving trajectory tracking performance.
- Implemented real-time control software in C/C++ and Python with ROS 2; conducted flight dynamics simulation using Isaac Sim and PyBullet.
- Applied flight mechanics and robust control to enhance autopilot stability under disturbances; participated in system integration, laboratory and field testing.

### Academic Research

**Embedded RL Control for Robots ** Aug. 2022 – Apr. 2025  
*Master's Thesis in Sharif University of Technology* Tehran, Iran

Supervisors: Nobahari Hadi, PhD

- Designed zero-sum, disturbance-augmented training yielding 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 and 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  
*Head of Lab (Former)* Tehran, Iran

Supervisors: Nobahari Hadi, PhD and Sharifi Alireza, PhD

- Led embedded AI (C) and RL projects for robotic control and navigation; developed LSTM-MLP for GPS-denied INS alignment achieving  $< 0.1\%$  drift vs Kalman-INS. 

**Game Theory-Based Control for 3-DoF Platform  ** Feb. 2021 – Sep. 2023  
*Bachelor's Thesis — Sharif University of Technology* Best Thesis Award 

Supervisor: Nobahari Hadi, PhD

- Designed LQI differential-game controller outperforming 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

- Code in Place (CS106A) [verify](#)
- Mentor 10 international learners in Python.

**Teaching Assistant — Sharif University of Technology** Sep. 2018 – Present

- 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

- 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
- L<sup>A</sup>T<sub>E</sub>X

- **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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