

# 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

<b>Robotic Engineer at Fasta Robotics <a href="#">fasta.technology</a> </b> <i>Autonomous Mobile Robot Development</i>	Oct. 2025 – Present Tehran, Iran
<ul style="list-style-type: none"><li>• Developed AI-driven navigation for warehouse AMRs; reduced manual intervention by 40%.</li><li>• Deployed embedded ML for obstacle detection, path planning, and collision avoidance.</li><li>• Designed multi-robot fleet coordination algorithms optimizing task allocation and traffic flow.</li><li>• Fused LiDAR, camera, and IMU data for robust SLAM-based localization and mapping.</li><li>• Architected ROS 2 nodes for reliable hardware-software communication across the fleet.</li><li>• Validated controllers in Isaac Sim and PyBullet; generated synthetic datasets for training.</li></ul>	

### Academic Research

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

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

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

## TEACHING EXPERIENCE

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

## 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](#)