

# ALI BANIASAD

Tehran, Iran

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## Education

<b>Sharif University of Technology</b> <i>Master of Science in Aerospace Engineering</i>	<b>Sep. 2022 – Apr. 2025</b> <i>Tehran, Iran</i>
<b>Sharif University of Technology</b> <i>Bachelor of Science in Aerospace Engineering</i>	<b>Sep. 2017 – May 2022</b> <i>Tehran, Iran</i>


## Research Interests





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


## Publications

- 2025 [J] A. Sharifi, **A. BaniAsad**, et al., “Applied an In-Motion Transfer Alignment Approach During Global Positioning System Outages Utilizing a Recurrent Neural Network Algorithm,” *Eng. Appl. AI* — [Elsevier DOI](#).
- 2025 [C] **A. BaniAsad** and H. Nobahari, “Robust DDPG Reinforcement Learning Differential Game Guidance in Low-Thrust, Multi-Body Dynamical Environments,” *23rd Int. Conf. of Iranian Aerospace Society* — Accepted.
- 2025 [C] M. Amirpour, **A. BaniAsad** and H. Nobahari, “Reinforcement Learning-Based Controller Design for a Suspended Ball Plant,” *23rd Int. Conf. of Iranian Aerospace Society* — Accepted.
- 2024 [J] **A. BaniAsad**, et al., “Attitude Control of a 3-DoF Quadrotor Platform Using a Linear Quadratic Integral Differential Game Approach,” *ISA Trans.* — [Elsevier DOI](#).
- 2022 [C] H. Nobahari, **A. BaniAsad**, et al., “Linear Quadratic Integral Differential Game Applied to the Real-Time Control of a Quadrotor Experimental Setup,” *ICRoM* — [IEEE DOI](#).

## Research Experience & Projects

<b>Embedded RL Control for Robots</b> 	<b>Aug. 2022 – Apr. 2025</b> <i>Tehran, Iran</i>
<i>Master’s Thesis, Sharif University of Technology</i>	
<ul style="list-style-type: none"><li>• Outperformed classical MPC, cutting trajectory-tracking error by 22% within strict on-board CPU/memory limits.</li><li>• Designed zero-sum, disturbance-augmented training that kept policies stable under <math>10\times</math> worst-case perturbations.</li><li>• Engineered 15 k LOC RL control stack (DDPG, TD3, SAC, PPO) in PyTorch/TensorFlow+Gym for embedded robots.</li><li>• Validated robustness on Gymnasium locomotion tasks—Ant, Humanoid, HalfCheetah, Walker2d.</li><li>• Ported the system to a C++/Python ROS 2 hardware-in-the-loop node for on-board testing.</li></ul>	



<b>Researcher at CNAV Lab</b>   	<b>May 2020 – Feb. 2025</b> <i>Tehran, Iran</i>
<i>Head of Lab (Current), Researcher (Former)</i>	
<ul style="list-style-type: none"><li>• Led projects on embedded AI in C, reinforcement learning, and ROS for robotic control systems.</li><li>• Robust in-motion Transfer Alignment method based on the multilayer Neural Network. <ul style="list-style-type: none"><li>* Proposed LSTM–MLP that performs in-motion using only IMU + SINS data when GPS is unavailable.</li><li>* Cut navigation drift to <math>&lt; 0.1\%</math> of the Kalman-INS error during 100 s GPS outages.</li><li>* Generalized across ship, ROV, and car datasets, outperforming conventional methods out of domain.</li></ul></li></ul>	

<b>Game Theory-Based Control for 3-DoF Platform</b> 	<b>Feb. 2021 – Sep. 2023</b> <i>Tehran, Iran</i>
<i>Bachelor’s Thesis, Sharif University of Technology</i>	
<ul style="list-style-type: none"><li>• Modelled a <a href="#">3-DoF setup</a> in Simulink and identified dynamics for parameter estimation.</li><li>• Designed a robust controller via differential game theory and Nash equilibrium.</li><li>• Implemented the controller through a MATLAB/Simulink–to–C pipeline for real-time hardware tests.</li><li>• Benchmarked against ADRC and DOBC, achieving superior disturbance rejection and robustness.</li></ul>	

## Awards and Honors

- Best B.Sc. Thesis Award, Iranian Aerospace Society (2023)
- Top 0.5% of 150 000, Iran B.Sc. Entrance Exam (2017)
- Ranked 23rd nationally, Iran M.Sc. Aerospace Exam (2022)
- [NODET](#) exceptional-talent scholar. (2010–2017)

## Technical Skills

**Programming Languages:** C/C++, Embedded C, MATLAB, Python  
**Tools & Platforms:** Git, Linux , ROS, Simulink, \_Terminal,  $\LaTeX$   
**Libraries/Frameworks:** Matplotlib, NumPy, Pandas, PyTorch, TensorFlow