

# ALI BANIASAD

Tehran, Iran

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## Education

**Sharif University of Technology** Sep. 2022 – Apr. 2025  
*Master of Science in Aerospace Engineering* Tehran, Iran

**Sharif University of Technology** Sep. 2017 – May 2022  
*Bachelor of Science in Aerospace Engineering* Tehran, Iran

## 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

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

- Outperformed classical MPC, cutting trajectory-tracking error by 22% within strict on-board CPU/memory limits.
- Designed zero-sum, disturbance-augmented training that kept policies stable under  $10\times$  worst-case perturbations.
- Engineered 15 k LOC RL control stack (DDPG, TD3, SAC, PPO) in PyTorch/TensorFlow+Gym for embedded robots.
- Validated robustness on Gymnasium locomotion tasks—Ant, Humanoid, HalfCheetah, Walker2d.
- Ported the system to a C++/Python ROS 2 hardware-in-the-loop node for on-board testing.

**Researcher at CNAV Lab**    May 2020 – Feb. 2025  
*Head of Lab (Current), Researcher (Former)* Tehran, Iran

- Led projects on embedded AI in C, reinforcement learning, and ROS for robotic control systems.
- Robust in-motion Transfer Alignment method based on the multilayer Neural Network. 
  - \* Proposed LSTM-MLP that performs in-motion using only IMU + SINS data when GPS is unavailable.
  - \* Cut navigation drift to  $< 0.1\%$  of the Kalman-INS error during 100 s GPS outages.
  - \* Generalized across ship, ROV, and car datasets, outperforming conventional methods out of domain.

**Game Theory-Based Control for 3-DoF Platform**  Feb. 2021 – Sep. 2023  
*Bachelor’s Thesis, Sharif University of Technology* Tehran, Iran

- Modelled a [3-DoF setup](#) in Simulink and identified dynamics for parameter estimation.
- Designed a robust controller via differential game theory and Nash equilibrium.
- Implemented the controller through a MATLAB/Simulink-to-C pipeline for real-time hardware tests.
- Benchmarked against ADRC and DOBC, achieving superior disturbance rejection and robustness.

## 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, L<sup>A</sup>T<sub>E</sub>X

**Libraries/Frameworks:** Matplotlib, NumPy, Pandas, PyTorch, TensorFlow