

ALI BANIASAD

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Education

Sharif University of Technology September 2022 – December 2024 (Expected)
Master of Science in Aerospace Engineering Tehran, Iran

Sharif University of Technology September 2017 – May 2022
Bachelor of Science in Aerospace Engineering, GPA: 3.72/4 (17.56/20) last 6 semesters Tehran, Iran

Research Interests

- Reinforcement Learning
- Artificial Intelligence
- Robotics
- Automatic Control
- Optimal Control
- Deep Learning
- Computer Vision
- Game Theory

Publications [Google Scholar profile]

- **Ali BaniAsad**, Alireza Sharifi, Reza Pordal, Hadi Nobahhari. "Attitude Control of a 3-DoF Quadrotor Platform Using a Linear Quadratic Integral Differential Game Approach." *ISA Transactions*, Elsevier, 2024.
- Alireza Sharifi, **Ali BaniAsad**. "Robust In-Motion Transfer Alignment of Low-Grade Inertial Navigation Systems with Recurrent Neural Networks in the Event of Reference Malfunction." *Engineering Applications of Artificial Intelligence*, 2024 (Submitted).
- Hadi Nobahhari, **Ali BaniAsad**, Alireza Sharifi. "Linear Quadratic Integral Differential Game Applied to the Real-time Control of a Quadrotor Experimental Setup." *ICRoM*, IEEE, 2022.

Research Experience

Researcher at CNAV Lab May 2020 – Ongoing
Head of Lab (Current), Researcher (Former) Tehran, Iran

- Led projects on **embedded AI** in C, **Reinforcement Learning (RL)**, and **ROS** for robotic control systems.
- Developed quadrotor tech and AI navigation, enhancing vehicle **precision** and **safety**.

Master's Thesis August 2022 – December 2024 (Expected)
Reinforcement Learning for Robotics in Complex Dynamical Systems Tehran, Iran

- Investigated various **Reinforcement Learning** methods and compared their performance to classic control strategies.
- Integrated **ROS** to implement and test **real-world robotic** systems, validating performance in practical scenarios.

Bachelor's Thesis February 2021 – September 2023
Game Theory-Based Control for a Quadrotor with Three Degrees of Freedom Tehran, Iran

- Controlled a quadcopter stand using **differential game** theory, employing **Nash equilibrium** for **robust** controller.
- Evaluated performance through Simulink simulations and practical **implementation** on a three degree of freedom setup.

Projects

Optimized Flocking of Autonomous Drones | Embedded C, HIL, Optimization, Simulink, Swarm July 2023

- Developed a UAV swarm model optimizing flocking under **real-world constraints** such as **delays** and **obstacles**.
- Implemented and validated the model with Simulink simulations and **HIL** testing using a **microcontroller**.

Multi-Objective Heuristic Optimization | OOP, Optimization Algorithms, Python February 2023

- Implemented the **REMARK** algorithm for **multi-objective** optimization with conflicting objectives.
- Utilized heuristic methods to achieve high approximations of the **Pareto set**, balancing trade-offs between objectives.

Advanced Aircraft Trim Stability Analysis with DATCOM | Advanced UI, Aircraft Control, Python March 2022

- Developed an advanced UI for Digital DATCOM software, **optimizing analysis** and enhancing design precision.

AIAA Regional Jet Design Competition | Aircraft Design, Computer Modeling, MATLAB, Python June 2021

- Fully designed a regional jet, encompassing coding, computer design, and simulations.

Awards and Honors

- Iranian Aerospace Society's **Best Undergraduate Thesis** Award.
- Ranked **Top 0.5%** in Nationwide Undergraduate Entrance Exam among more than 150,000 participants, 2017.

Technical Skills

Programming Languages: C/C++, Embedded C, MATLAB, Python

Tools and Platforms: Git, Linux, ROS, Simulink, Terminal, LaTeX

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

Quantitative Skills: Reinforcement Learning, Robotics, Data Structures, Deep Learning, Embedded Machine Learning, Heuristic Optimization, Game Theory