Hridai Ambati

Atlanta, Georgia | ahridai00@gmail.com | www.linkedin.com/in/ahridai
Portfolio: hridaia.github.io/portfolio/ | GitHub: github.com/hridaia

EDUCATION

Georgia Institute of Technology   Atlanta, Georgia
Bachelor of Science in Aerospace Engineering   May 2023 – Dec 2025
Minor in Scientific Engineering and Computing
GPA: 3.8

SKILLS

Framework Development	GNC	Multi-Agent Autonomy
Convex Optimization	State Estimation	Cooperative Control
C++, Python, MATLAB	ROS 2, MuJoCo, SysML	Motion Planning

WORK EXPERIENCE

Aerospace Robotics Laboratory (ARL)   Atlanta, Georgia
Undergraduate Researcher   Jan 2025 – Present
- Develop tools and frameworks for autonomous spacecraft testing, GNC, and multi-agent mission design
- Research spacecraft GNC with faculty and graduate students on algorithms, dynamics modeling, and optimization

Aerospace Systems Design Laboratory (ASDL)   Atlanta, Georgia
Undergraduate Researcher   Jan 2024 – May 2025
- Built object-oriented SysML and Simulink ascent models for NASA Space Shuttle, Saturn V, and Falcon Heavy
- Simulated closed loop ascent control, with gimbal error under 5 degrees and velocity within 10%

PROJECT EXPERIENCE

Formation Flying Spacecraft Simulation Framework | https://hridaia.github.io/portfolio/projects/flagship.html
ARL Research   Jan 2025 – Present
- Developed a high-fidelity simulation framework using ROS 2 and MuJoCo to model multi-agent formation flight
- Simulated 5+ spacecraft with robotic arms, MOI, relative orbit, and contact dynamics using RK4 at 1 kHz
- Integrated C++/Python architecture with accelerometer, gyroscope, and camera fusion at 0.5 kHz via EKF/UKF
- Implemented GNC for pathfinding, cooperative control, collision avoidance, and vision-based state estimation

Optimal Guidance and Control for Orbital Injection | https://hridaia.github.io/portfolio/projects/orbital-injection.html
Optimal Guidance and Control   May 2024 – May 2025
- Formulated an optimal rocket ascent and orbital injection problem with state and costate dynamics
- Designed linear feedback guidance about the nominal trajectory and validated open/closed loop results

3D Quadcopter DDP Guidance and Control Simulation | https://hridaia.github.io/portfolio/projects/quadrotor-ddp.html
Robotics and Autonomy   May 2024 – May 2025
- Used differential dynamic programming on a 12-state quadrotor to generate obstacle-avoiding trajectories
- Built a receding horizon MPC controller and tested on simulated Robotarium hardware for closed-loop validation

CAMPUS & COMMUNITY INVOLVEMENT

Georgia Tech Ramblin' Rocket - GNC   Aug 2024 – Present
- Collaborated on a comprehensive rocket GNC simulation architecture and class hierarchy in MATLAB
- Built environment models for 0-100 km altitudes and 0-35 m/s wind gusts and perturbations
- Developed inertial state estimation algorithms and IMU fusion to minimize RMSE at 200 Hz
- Simulated LQR with 1000+ Monte Carlo runs varying aerodynamics, thrust, mass, and environmental conditions

RELEVANT COURSEWORK

Orbital Mechanics	Two-body/N-body, orbit determination, maneuvers, rendezvous
Optimal Guidance and Control	Variational methods, Pontryagin principle, LQR, numerical methods
Robotics and Autonomy	Planning and control, state estimation, SLAM, multi-robot systems