Rokeshuvaraj Nagarajan

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EDUCATION

Virginia Tech — M.S. Aerospace Engineering Expected May 2026
GPA: 3.76 / 4.0
Coursework: Flight Dynamics, System Dynamics & Control, GPS & Satellite Navigation, Orbital Mechanics, Numerical Methods

Alliance University — B.Tech Aerospace Engineering Aug 2020

TECHNICAL SKILLS

Guidance, Navigation & Control: PID, LQR, MPC, Control Allocation, Aircraft Longitudinal & Lateral Dynamics, Linearization
Estimation: Kalman Filter (KF), Extended Kalman Filter (EKF), State Estimation, Sensor Fusion, GPS Modeling
Simulation: MATLAB, Simulink, Control System Toolbox, 6-DOF Modeling
Programming: Python, C/C++, ROS
Systems: Linux, Git, Jetson, BeagleBone

EXPERIENCE

Graduate Teaching Assistant — System Dynamics and Control (AOE 3034) Jan 2026 – May 2026
Virginia Tech

- Assisted instruction in state-space modeling, stability analysis, and feedback controller design
- Guided MATLAB/Simulink simulation of dynamic aerospace systems

Graduate Teaching Assistant — Computational Methods (AOE 2074) Aug 2025 – Dec 2025
Virginia Tech

- Supported numerical ODE solvers, root-finding, and aerospace simulation validation

PROJECTS

Autonomous Multirotor Guidance & Control System 2025 – Present

- Developed nonlinear 6-DOF UAV dynamic model in MATLAB/Simulink
- Designed PID, LQR, and MPC controllers for trajectory tracking and disturbance rejection
- Implemented Extended Kalman Filter for attitude and position estimation using onboard sensor fusion
- Applied control allocation for multi-actuator thrust distribution
- Integrated ROS-based architecture for real-time telemetry and closed-loop testing

GPS-Based Navigation Modeling

- Modeled satellite-based positioning algorithms and analyzed dilution of precision and propagation errors in MATLAB

PUBLICATION

R. Nagarajan et al., "Design and Fabrication of Balloon Satellite," *International Journal of Engineering Applied Sciences and Technology*, Vol. 4, Issue 9, 2020.