

# Scott Nguyen

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## EDUCATION

Master of Science in Electrical Engineering |Space Systems Engineering

University of New Mexico

Summer 2026

GPA: 3.94/4.00

Master of Science in Aerospace Engineering

University of Illinois Urbana-Champaign

Fall 2024

Bachelor of Science in Aerospace Engineering

Iowa State University

Spring 2022

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## SKILLS

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

Frameworks / Libraries / Tools: NumPy, SciPy, Matplotlib, Astropy, Poliastro, bpy, git

Applications: Simulink, Blender

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## WORK EXPERIENCE

Student Co-Op, Electronics for Contested Space Group

September 2025 – Present

MIT Lincoln Laboratory

- Implemented an *Unscented Kalman Filter (UKF)* for precise optical sensor measurement fusion and state estimation
- Built a probabilistic detection tool to compute observation likelihoods based on resident space object properties and optical sensor performance

Guidance, Navigation & Controls Engineer Intern

May 2025 – August 2025

Blue Canyon Technologies

- Performed post-environment (TVAC/vibe) functional testing of *IMU*, *Nano Star Tracker*, *Reaction Wheels*, *Torque Rods*, and *Sun Sensors*; verified polarity, health, and performance against flight acceptance criteria.
- Led root-cause investigation of *SADA* command-response latency; characterized timing delay across modes, identified the source, and informed updates to command/telemetry interfaces and test limits.
- Automated *SADA* validation in *COSMOS* with *Ruby* scripts; mapped telemetry channels, implemented pass/fail logic, and generated reproducible test reports.

Guidance, Navigation & Controls Engineer Intern

January 2025 – April 2025

Blue Origin

- Designed a hybrid *Active Disturbance Rejection Control (ADRC)* + *Sliding Mode Control (SMC)* controller; used an extended state observer and a sliding manifold for robust tracking under uncertainty and actuator limits.
- Injected time-domain disturbances and conducted a trade study comparing the hybrid controller to *PID* and *LQR* on LTI linearizations; benchmarked rise time, settling time, and overshoot.
- Integrated flight software into *Simulink* via *C S-functions* to run full closed-loop simulations.

Guidance, Navigation & Controls Engineer Intern

May 2024 – August 2024

Varda Space Industries

- Conducted trade studies to optimize gravity models for mission requirements and select the best filter (*Extended Kalman Filter (EKF)* vs. *Unscented Kalman Filter (UKF)*)
- Created Monte Carlo simulations to perform flight safety analysis and develop reentry criteria for capsule reentry
- Implemented an *EKF* for state estimation, optimizing ground station data timing to minimize residuals and enable precise delta-v planning
- Implemented unit testing for the code base and introduced CI/CD pipelines using Bamboo

Guidance, Navigation & Controls Engineer Intern

May 2023 – August 2023

Space Dynamics Laboratory

- Implemented a UKF with range iteration and least squares orbit determination methods using optical navigation
- Performed Monte Carlo analysis on relative orbits to identify challenging scenarios and refine the algorithm
- Programmed and developed unit tests for *Lambert Solver* to be utilized with *Initial Orbit Determination (IOD)*

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## RESEARCH PROJECTS

Delta-V Minimization from Geostationary Orbit to Mars

- Generated pork-chop plots using Lambert solutions and cross-validated optimizer results with the plot's global and local minimum regions to ensure consistency
- Utilized Blender's Python API to visualize the optimized trajectory and animate planetary motion