Nicholas Natsoulas

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EDUCATION

University of Colorado Boulder, *Smead Department of Aerospace Engineering Sciences* — Boulder, CO
Master of Science in Aerospace Engineering–Astrodynamics & Satellite Navigation; ***GPA: 4.0*** — **August 2024 - May 2026**
HSF Scholar Sponsored by the Walt Disney Company Foundation

Cornell University, *The Sibley School of Mechanical and Aerospace Engineering* — Ithaca, NY
Bachelor of Science in Mechanical Engineering; ***GPA: 3.5*** *– 6 semesters* — **August 2020-December 2023**

EXPERIENCE

Autonomous Vehicle Systems Laboratory (CCAR) — Boulder, CO
Graduate Research Assistant — ***August 2024 – Present***

- Spacecraft simulation software development for the Basilisk Astrodynamics simulation framework using Python OOP, C++ OOP, and common libraries like Eigen, Numpy, Pandas, Bokeh, and SWIG
- Developed Interactive Monte Carlo visualization software in Python using Bokeh and Pandas
- Research Assistantship advised by Dr. Hanspeter Schaub

Vast Space — Long Beach, CA
Guidance Navigation and Controls Engineering Intern — ***May 2024 – August 2024***

- Crewed Space Station (Haven-1) GNC subsystem engineering
- Human Motion dynamics model development as a second order perturbation for 6DOF simulation truth model in C++
- Human Motion trajectory profiling using polynomial approximation in C++ with Matlab animation
- 6DOF Spacecraft flight simulation development using C++ OOP
- IIP Prediction & State Transition flight algorithm development in C++ with GTest unit tests and CMake build system
- Hohmann Transfer Guidance flight algorithm development in C++ with GTest unit tests and CMake build system

Varda Space Industries — El Segundo, CA
Guidance Navigation and Controls Engineering Intern — ***January 2024 – May 2024***

- Space-manufactured pharmaceutical payload reentry data review using Grafana and Influxdb
- Trajectory Reconstruction of Reentry Flight with IMU Data and EKF State Estimation
- 6DOF Satellite flight simulation and algorithm development in Python and C++
- Ground station camera and radar tracking trajectory input file generation and scripting
- Flight Safety Analysis for Reentry using Monte Carlo simulation and statistical analysis

SpaceX — Redmond, WA
Guidance Navigation and Controls Engineering Intern — ***May 2023 – August 2023***

- Member of Starlink's Collision Avoidance GNC team
- Cradle-to-grave GNC algorithm development that yielded a 10X runtime performance increase
- SQL and Grafana, Python, and Bokeh for data visualization and analysis

Blue Origin — Kent, WA
Mission Design Engineering Intern — ***September 2022 – December 2022***

- Development of Lunar Mission Design software for Copernicus using Python and Julia

NASA Glenn Research Center — Cleveland, OH
Attitude Control Engineering Intern — ***June 2022 – August 2022***

- Development of 6-DOF Spacecraft Flight Simulation featuring Lyapunov-Stable reference-tracking control laws tuned for a monolithic Flexible-Structure Spacecraft in Matlab, used for rapid ACS design in the Compass Lab

SOFTWARE SKILLS

C++ 14 & 17 | PYTHON | GIT | PYTEST | GTEST | COPERNICUS | STK | MONTE CARLO | OOP | MATLAB & SIMULINK

HOBBIES

Work-Out: Running (4-hour marathoner), Weight Training, Hiking **Games:** Backgammon, Foosball, Ping Pong, Chess