Nicholas Natsoulas

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EDUCATION

Cornell University, *The Sibley School of Mechanical and Aerospace Engineering* — Ithaca, NY
Pursuing Bachelor of Science in Mechanical Engineering — **Aug 2020- Dec 2023**

Relevant Coursework: Spaceflight Mechanics (Teaching Assistant Fall 2023), Advanced Astrodynamics, Stochastic Adaptive Control, Space Systems & Technology, Advanced Dynamics & Vibrations, Linear Algebra, System Dynamics, Differential Equations, Multivariable Calculus; Technical University of Denmark Exchange Spring 2023;

PROFESSIONAL EXPERIENCE

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 performance increase
- Honing software development skills such as Git, Linux, and use of the Pandas and NumPy Python libraries
- Developed Monte-Carlo simulation to test algorithm performance and robustness
- Analysis using fundamental orbital mechanics, dynamics, and optimization
- SQL and Grafana for data analysis

Blue Origin — Kent, WA
Guidance Navigation and Controls Engineering Intern — ***September 2022 – December 2022***

- Mission Design in the Advanced Development Programs
- Development of Mission Design software tools for Copernicus using Julia, Python, and Copernicus' native API
- Automatic trajectory solutions across the calendar for many potential Mission start dates
- Automatic conversion of low-fidelity trajectory solutions to high-fidelity solutions
- Use of Git/GitLab for version control during software development
- Parallel computing for automation software using Linux
- Professional documentation and communication of software development process and user operation

NASA Glenn Research Center — Cleveland, OH
Guidance Navigation and Controls 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 design in the Compass Lab
- Focus on Robust Attitude Control given uncertainties in mass and controlling attitude actuators with real-world limitations to accomplish subsystem mission requirements (i.e., slew time, pointing accuracy, etc.)
- Development of a thruster assessment tool assisting the design of RCS placement and sizing. This tool acknowledges constraints imposed by mission requirements and actuator performance.

Cornell University Space Systems Design Studio — Ithaca, NY
Attitude Control Engineer — ***February 2022 – December 2023***

- Dynamics simulations and control algorithm development for a CubeSat's attitude control using MATLAB, Simulink, and C++, Monte Carlo simulation for detumbling algorithm, and native C++ high-performance EKF development.
- ACS integration, testing, and validation.

SKILLS & INTERESTS

Software Skills: STK | COPERNICUS | MATLAB | PYTHON | C++ | JULIA | SIMULINK | GIT
Personal Projects: LQR Spacecraft Rendezvous 3-DOF Simulation (C++), Kalman Filtering Software (Python) [See Github]
Professional Interests: SIMULATION | MISSION DESIGN | SPACECRAFT DYNAMICS | OPTIMAL CONTROL

HOBBIES

Music: Oud (Arabic Music Club), Viola (Baroque Ensemble), Accordion (Norteño), Bouzouki (Rempetiko)
Exercise: Running (primarily 5k), Weight Training, Hiking — **Games:** Backgammon, Foosball, Ping Pong, Chess