Cyrus Nolan

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Objective

Launch a career working on spacecraft as a guidance, navigation, and control engineer.

Education

Cornell University, Sibley School of Mechanical and Aerospace Engineering, Ithaca, NY
M.Eng. in **Aerospace Engineering** with focus on spacecraft GNC, May 2024, GPA: 3.90
B.S. in **Mechanical Engineering**, Dec 2019, GPA: 2.77

Fall 2023 Coursework: Orbital mechanics, attitude dynamics and control, Newtonian mechanics, Lagrangian mechanics, classical control theory, and trajectory optimization.
Spring 2024 Coursework: Spacecraft technology and systems architecture, multivariable control theory, model-based estimation (Kalman filtering), and flight vehicle dynamics.

Project Experience

Magneto-Attitude Propulsion, Cornell University **Aug 2023 - Current**

- Spacecraft design project in which the proposed orbiting spacecraft generates some propulsion by maintaining a specific attitude trajectory and using Earth's magnetic field and the gravity gradient.
- Created a 6 DoF spacecraft model using Matlab and Simulink with quaternion attitude representation and implemented 3-axis attitude control using a PD control law.
- Designing control laws to meet requirements on spacecraft attitude, trajectory of two masses that spin about the spacecraft, and the total angular momentum to prove the concept in simulation and go for funding.

Bowling Ball Dynamics, Cornell University **Aug 2023 - Dec 2023**

- Derived the equations of motion for a bowling ball for the slipping and rolling cases using both Newtonian and Lagrangian mechanics.
- Animated the equations of motion using Matlab with initial conditions typical of a professional bowling shot, most notably ~30 rad/s of angular velocity parallel to the lane that causes the ball's trajectory to hook as it travels down the lane.

Trajectory Optimization, Cornell University **Aug 2023 - Dec 2023**

- Used Pontryagin's maximum principle to analytically find the fuel-minimizing control input for a double-integrator quadratic-cost point-to-point maneuver like satellite reorientation or space launch.
- Ran Monte-Carlo simulations (1500 runs) with gaussian sensor noise and uniform inertia variation to compare implementations of the optimal trajectory like real-time optimal control and control law-inversion patching filters.

ISS Trajectory Ground Track, Personal **Jul 2023**

- Wrote MATLAB code that uses NASA's ISS ephemeris data to plot the current location and trajectory of the ISS.

Technical Skills

MATLAB, Simulink, Simscape, C, Fusion 360 CAD

Work Experience

Assistant to CEO, Ultimate Human Performance, Rancho Santa Fe, CA **Mar 2021 - Sep 2022**
Physical Therapy Aide, G3 Physical Therapy, Encinitas, CA **Jan - Aug 2021**
Professional Football Training, Encinitas, CA **Jan - Aug 2020**
Dedicated ~40 hours per week to rehab, physical training, and NFL film study.

Cornell Football Honors

- *Red Key Athlete Honor Society*: Nominated by my coaches for displaying integrity, leadership, responsibility, and a commitment to academics and community service. **2018**
- *Sid Roth Award*: Most Valuable Down Lineman **2018**
- *Frank "Doc" Kavanagh Award*: Training Room Athlete of the Year **2018**
- *Bernie Olin Award*: Underdog Who Showed Determination, Grit, and Perseverance **2017**