Cyrus Nolan

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OBJECTIVE

Launch a career working on guidance, navigation, and control of launch vehicles or reentry vehicles to help get humans to Mars as soon as possible.

EDUCATION

Cornell University, College of Engineering, Ithaca, NY **May 2024**
Master of Engineering in **Aerospace Engineering** **GPA: 3.90**

Selected Coursework: Orbital Mechanics • Spacecraft Attitude Dynamics and Control • Multivariable Control Theory • Pontryagin's Maximum Principle • Model Based Estimation • Classical Control Theory • Dynamics of Flight Vehicles • Newtonian & Lagrangian Mechanics

Cornell University, College of Engineering, Ithaca, NY **Dec 2019**
Bachelor of Science in Mechanical Engineering **GPA: 2.77**

Selected Coursework: Aeronautics • System Dynamics • Fluid Mechanics • Heat Transfer • Oscillations, Waves, and Quantum Physics • Electromagnetism • Mechatronics • Mechanical Synthesis

RELEVANT ACADEMIC PROJECTS

Magneto-Attitude Propulsion Spacecraft, *Aerospace Engineering Department,* Cornell University **Aug 2023 - Present**

- 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.
- Improved simulation fidelity by modeling the distribution of mass throughout the large spacecraft and incorporated the resulting gravity gradient effects.
- Designing control laws to meet requirements on spacecraft attitude and angular momentum to prove the concept in high-fidelity simulation and go for funding.

Bowling Ball Dynamics, *MAE 5730: Intermediate Dynamics,* Cornell University **Fall 2023**

- Derived the equations of motion for a bowling ball in 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, which causes ball's trajectory to hook as it travels down the lane.

Trajectory Optimization, *MAE 5830: Astronautic Optimization,* Cornell University **Fall 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.

Full Engineering Portfolio: https://cyrusnolan.github.io

SKILLS

- *Computer*: MATLAB, Simulink, Python, C, Linux, Fusion 360 CAD
- *Hardware*: Microcontroller, IMU, Mill, 3D Printing, Soldering
- *Personal*: Jiu Jitsu (purple belt)

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