Cyrus Nolan

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OBJECTIVE

Launch a career working on guidance, navigation, and control of spacecraft 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.
- Implemented custom MATLAB classes to initialize the simulation, improving sim robustness and iterability.
- 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