Nick Cline

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EDUCATION

University of Massachusetts Amherst — **Amherst, MA**

B.S., M.S. in Mechanical Engineering | GPA 3.49/4.0 — *May 2022*

Minor in Computer Science

WORK EXPERIENCE

Draper Laboratory — **Cambridge, MA**

Mechanical Instrumentation Engineer II — *Aug 2022 – Present*

- Developed innovative design features for a sensor assembly by exploring trade spaces and proposing new solutions, coordinating with a cross-functional team to plan reviews, track performance and meet strict requirements.
- Designed and tested production prototypes, analyzing test data to identify areas for revision and validate production processes for critical assembly features.

Charge Analytics LLC — **Ipswich, MA**

Design Engineer — *Jun 2021 - Aug 2021*

- Executed end-to-end product development processes, from initial concept ideation and mechanical design to electronics packaging and prototype fabrication using 3D printing techniques.
- Generated CNC Fabrication process for retrofitting low-volume IoT parts to reduce costs by nearly 90% relative to quotes.

RESEARCH EXPERIENCE

University of Massachusetts Amherst HRSL — **Amherst, MA**

Graduate Researcher — *Dec 2021 - May 2022*

- Created control scripts in Python to implement custom impedance control loops on the HRSL Hip Exoskeleton using a Raspberry Pi 4 and the FlexSEA API.
- Analyzed the effect of unilateral stiffness on human gait by comparing kinematic metrics over stiffness ON and OFF phases, with results published in IROS 2022.
- Identified key areas for quality-of-life improvements and wrote software solutions to deliver key test metrics in real-time with low latency, enabling better feedback for control and evaluation.

PROJECT EXPERIENCE

Robotic Simulation

- Built a Furuta pendulum model for use in Gazebo, controlled with C++ scripts and ROS 2. Developed swing-up and energy-minimizing controllers to stabilize pendulum. Future implementations include RL control of the pendulum and double pendulum control.

PUBLICATIONS

M. Price et al., "Unilateral stiffness modulation with a robotic hip exoskeleton elicits adaptation during gait," 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, 2022, pp. 12275-12281, doi: 10.1109/IROS47612.2022.9981067.

SKILLS & INTERESTS

Skills Atlassian Suite, C, C++, Python, Rust, Julia, MATLAB, Solidworks, ROS 2, Gazebo, Drake, MPC, Nonlinear Dynamics, OpenCV.