

Alex Zeng

Mechanical Engineer · Boston, MA

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EDUCATION

Northeastern University

Boston, MA

Candidate for Bachelor of Science in Mechanical Engineering · GPA: 3.89

September 2019 - May 2023

- Awards: Dean's Scholarship, Dean's List (Fall 2019 – Fall 2021)
- Relevant Courses: Systems, Fluid Mechanics, Dynamics, Mechanics of Materials, Thermodynamics, Statics
- Activities: Northeastern Mars Rover Team (Arm Lead), ASME, Pep Band, Wind Ensemble

WORK EXPERIENCE

Mechanical Engineering Co-op

Waltham, MA

Vicarious Surgical, Inc.

January 2022 - June 2022

- Expanded the overall reliability effort for future instruments with 9 unique testing projects
- Automated tensile testing data collection and analysis using Python (pandas, Matplotlib), streamlining the data analysis workflow and reducing processing time to 30 seconds
- Prototyped and calibrated a flexure-based force sensor to measure grip force of the arm's end effector that provides more accurate and representative grip force measurements than conventional load cells
- Designed three custom arm subassembly test fixtures to isolate features on the arm prone to failure, permitting more iterative design on the arm without requiring a full arm to run testing
- Created a 3D force visualization script using Python to analyze the forces enacted on the arm during testing

Mechanical Engineering Intern

Boston, MA

Nextera Robotics

June 2021 - August 2021

- Prototyped and constructed a cost-effective, vacuum suction end-of-arm tooling for a 6DoF industrial robotic arm capable of lifting 4'x8' drywall sheets according to FEA and material mechanics calculations
- Consolidated a 360 degree and two USB cameras into a simple 4-part, 3D printed assembly
- Sourced and compiled \$2,000 worth of mechanical and electrical components into BoMs for purchase

Reliability Engineering Co-op

Andover, MA

MKS Instruments, Inc.

January 2021 - June 2021

- Performed highly accelerated life testing on mass flow controllers in temperature and vibration chambers, verifying product performance specifications and writing a life testing report
- Streamlined arduous data entry by coding Python scripts to aggregate raw data into Excel spreadsheets, decreasing routine data entry time
- Improved future product reliability by keenly searching for abnormalities during testing by discovering a product series experienced memory corruption issues

PROJECTS

Arm Team Lead & Mechanical Co-lead

Boston, MA

Northeastern University Mars Rover Team (NUROVER)

September 2019 - Present

- Collaborated with Northeastern students to build a 50kg Mars rover to compete in the University Rover Challenge
- Led the arm redesign effort, creating a 6 DoF robotic arm capable of lifting up to 6kg of weight at 0.9m away that features a differential miter gear wrist and twin lead screw gripper with interchangeable grips
- Coordinated the COTS and 3D printed parts procurement for the mechanical team via spreadsheets
- Operated a waterjet, CNC mills, and power tools to manufacture parts in Northeastern's MIE machine shop

SKILLS

Applications SolidWorks (CSWA, CAD&FEA), Fusion 360 (CAD&FEA), HSMWorks, Excel, MATLAB, PrusaSlicer

Fabrication 3D Printing (FDM&SLA), CNC Mills and Lathes, Waterjet, Laser Cutting, Power & Hand Tools

Languages Python (pandas, Matplotlib), HTML / CSS, PHP, C, VBA