

# Alex Zeng

Mechanical Engineer · Boston, MA

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## EDUCATION

### Northeastern University

Boston, MA

*Candidate for Bachelor of Science in Mechanical Engineering · GPA: 3.86*

*September 2019 - May 2023*

- Awards: Dean's Scholarship, Dean's List (Fall 2019 – Fall 2021)
- Relevant Courses: ME Capstone, CFD, Robot Mechanics and Controls, ME Design, Controls, Materials
- Activities: Northeastern Mars Rover Team (ex 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