ALEXANDER ZENG

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EDUCATION

Northeastern University – Boston, MA Expected May 2024
Candidate for Bachelor of Science in Mechanical Engineering **GPA: 3.95**
Awards: Dean's Scholarship, Dean's List (Fall 2019 – Fall 2020)
Relevant Courses: System Analysis, Fluid Mechanics, Dynamics, Mechanics of Materials, Thermodynamics, Statics
Activities: SEDS Mars Rover Team (Mobility Co-Lead), ASME, Pep Band, Concert Band

WORK EXPERIENCE

Nextera Robotics – Boston, MA **Mechanical Engineering Intern** (June 2021 – August 2021)
- Prototyped and constructed a cost-effective, vacuum suction end-of-arm tooling for a 6 axis industrial robotic arm in Fusion 360 that can lift 4'x8' drywall sheets according to FEA and material mechanics calculations
- Operated an infinite-Z 3D printer, manufacturing parts such as a robot tablet interface enclosure
- Consolidated a 360 degree and two USB cameras into a simple 4-part, 3D printed assembly
- Sourced mechanical and electrical components and compiled them into BoMs for purchase

MKS Instruments, Inc. – Andover, MA **Reliability Engineering Co-op** (January 2021 – June 2021)
- Devised and designed heated, aluminum extrusion enclosures for life testing of gas analyzers with a displacement of under 0.5mm against the weight of the units, saving over $2,000 and weeks of time compared to outsourcing
- Performed highly accelerated life testing on mass flow controllers using 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, significantly decreasing routine data entry time
- Improved future product reliability by keenly searching for abnormalities during testing, discovering that one product series experienced memory corruption issues

PROJECTS

SEDS Mars Rover (NUROVER) – Northeastern University **Mobility Co-Lead** (September 2019 – Present)
- Worked with a team of 33 students to engineer a Mars rover that was chosen for the University Rover Challenge
- Designed numerous mobility system parts using SolidWorks with a safety factor between 3 and 10 and tested parts on the rover in competition-like environments, confirming that parts can withstand the expected stresses
- Coordinated weekly team meetings to discuss design progress and ensure that Gantt chart deadlines are met
- Manufactured rover parts in the MIE machine shop using a plasma cutter, CNC mills, and power tools

Marble Machine X CAD Team – Online **Subassembly Team Leader** (June 2020 - Present)
- Collaborated weekly with 110 volunteers online to declutter and improve a machine with 6,000+ parts
- Modeled three "defeatured" parts according to QC standards, leading to an optimized, top-down master assembly controllable using one "skeleton" sketch and that mimics the real-life design to a $\pm$1mm accuracy
- Established a product breakdown structure (PBS) with an eight-digit number system to organize and group parts
- Merged subassembly parts while scrutinizing them for interferences, fit, and balance of design intent with simplicity

TECHNICAL SKILLS

Applications: Fusion 360, SolidWorks, Excel, MATLAB, Maple, AutoCAD, PrusaSlicer, Cura
Other: FEA, Coding (Python, C, VBA), FDM and SLA 3D Printing, CNC Machining, Power & Hand Tools

BACKGROUND AND INTERESTS

- Enthusiastic about combining music and engineering; built a tuba using PVC pipes and 3D printing as a high school CAPStone project and saved thousands of dollars by building a practice marimba and refurbishing a broken tuba
- Enjoy tinkering with electronics and tools, building computers, discussing tech, and gaming