Portfolio
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HANNAH GAZDUS

Engineer | Author | Artist

hgazdus@mit.edu
(732) 796-4768

EDUCATION

Massachusetts Institute of Technology (MIT) — Cambridge, MA
- Candidate for Master of Science in Mechanical Engineering, GPA: 5.0 — Class of 2025
- Bachelor of Science in Mechanical Engineering and Creative Writing, GPA: 5.0 — Class of 2023
- Relevant Coursework: Compliant Mechanisms, The Product Engineering Process, Measurement and Instrumentation, Design and Manufacturing I & II, Mechanics and Materials, Engineering Leadership

EXPERIENCE

Graduate and Undergraduate Research with the MIT Culpepper Lab — Feb 2022 - Present, Cambridge, MA
- Developed a parametric model in Excel to compare the stiffness and deformation of various kinematic couplings to determine the geometry that maximized repeatability and accuracy
- Simulated the motion of a Stewart Platform in Solidworks to determine the optimal geometry to minimize error
- Modeled and prototyped a bistable magnetic lead screw actuator for the ankle joint of an exoskeleton boot
- Designed plan for exploring social impact of makerspaces and increasing student agency

3 Roll Mill Project — Sept 2021 - Present, Cambridge, MA
- Designed a 3 roll mill with flexure-based roller adjustment mechanism for making paint
- Calculated ideal dimensions for flexures to prevent bending, buckling, and yield
- Turned pieces on a lathe and milled components to precise dimensions for press-fits

Undergraduate Research with the Mediated Matter Group, MIT Media Lab — Jan 2020 - June 2023, Cambridge, MA
- Modeled and fabricated a printhead and end effector to add multi-material capability and to increase print complexity for biopolymer 3D printer
- Designed & printed spirograph mandalas to refine printing parameters and explore material properties
- Conducted biodegradability tests to determine potential for material use in sustainable prototyping
- Discussed research in *Meet the Stars of 3D Printing: Construction Edition* panel hosted by Women in 3D Printing
- Printed biopolymer sculpture for the MoMA exhibit *Nature X Humanity*

MIT Elements of Mechanical Design Class — Feb - May 2023, Cambridge, MA
- Collaborated on a team of 7 students to design, model, and construct a tabletop lathe
- Designed flexures to allow for compliance in the lathe cross-slide and z drive by analyzing yield and deformation in Solidworks FEA
- Turned spindle shaft, using dial indicating and live-centering to ensure concentricity and prevent runout

MIT Product Engineering Process Class — Sept - Dec 2022, Cambridge, MA
- Collaborated with a team of 16 students to develop a disc sander that prevented injuries by detecting human touch through capacitive sensing and immediately halting rotation of the disc
- Designed and machined sanding disc to have a low moment of inertia, but high rigidity
- Constructed the internal frame of the sander, integrated components, and refined the external housing
- Enhanced teamwork, communication, and morale by serving as a team officer; organized social and working sessions, offered support to teammates, and assisted in organizing weekly meetings

MIT Measurement and Instrumentation Class — Feb - May 2022, Cambridge, MA
- Ran three-point bending tests and spectroscopy analysis on dried watercolor paint to identify ideal formula for handmade paint sold through personal art business Wren In Flight, LLC
- Documented and shared research and statistical analysis in a paper and poster presentation

SKILLS/INTERESTS

Digital: Fusion 360, Solidworks, FEA and parametric modeling, MATLAB, Excel, Adobe Photoshop/Illustrator
Fabrication: Lathe, mill, 3D printer, Smooth-On products, thermoformer, band saw, drill press, belt sander, laser cutter
Interests: Machine and production design, sustainability, compliant mechanisms, marine science, writing fantasy novels