

CHRISTINE ZHOU

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EDUCATION

Brown University (GPA: 3.88/4.00)

Sc.B. Mechanical Engineering and Visual Art

September 2019 – May 2023

Providence, Rhode Island

- **Relevant Coursework:** Dynamics and Vibrations, Metalworking, Electricity and Magnetism, Fluid Mechanics, Mechanics of Solids/Structures, Structural Analysis, Computer Aided Visualization/Design, Electrical Circuits, Instrumentation Design

EXPERIENCE

Hasbro

Product Design Engineer Co-Op (NERF)

July 2021 – Present

Pawtucket, Rhode Island

- Invented new internal blaster mechanism, optimized with force vs. time plots generated from SolidWorks Motion Analysis
- Designed, modeled, and tested barrel modifications through rapid prototyping, enhancing blaster firing accuracy by 13%
- Innovated clipping mechanism to secure motor in flywheel cage, reducing labor and hardware cost by 3% per blaster
- Manufactured casting molds for rapid prototyping of repetitive part designs to vary durometers, materials, and textures

Temple Allen Industries

Mechanical Engineer Intern

May 2021 – July 2021

Rockville, Maryland

- Led product development cycle for user-controlled surface preparation robots: part design, procurement, and assembly
- Wrote and performed 15+ tests to verify IP waterproof ratings, pneumatic valve function, material strength for parts
- Calculated numerical parameters for pneumatic cylinder force, drivetrain wheel torque, gear ratios, and cycle times
- Designed custom sensor window mount after root cause analysis, reducing sensor system assembly time by 30%

Breuer Lab at Brown University

Mechanical Engineer Research Assistant

January 2021 – Present

Providence, Rhode Island

- Executed solo repair of bat wing robot by studying component interactions; replaced severed wires of cam system
- Researched optimization of robot to: decrease wing weight, smoothen joint motion, and reduce friction between cams

USC Space Engineering Research Center (SERC)

Manufacturing Research Intern

June 2020 – September 2020

Los Angeles, California

- Developed a quantized inertia theory-based system that generates propellantless thrust using high-powered lasers
- Maximized thrust by iterating cavity designs while attentive to material thermal limits and CNC manufacturability
- Outsourced manufacturing using technical documentation, obtaining many quotes for cost comparison and saving \$500

PROJECTS

Apple Design Test: iPod Battery Door Mechanism (christinezhou.info/apple)

April 2021

- Innovated latch and damped spring door mechanisms, modeled in SolidWorks assembly with 10+ dynamic components
- Determined total production cost of new iPod using costs of direct labor, raw materials, and manufacturing overhead
- Simulated applied forces and displacements on latch (FEA) in Fusion 360, resulting in a factor of safety of 8

UtiliTool: A Touchless Keychain Tool (christinezhou.info/utilitool)

August 2020

- Analyzed various flexible materials (TPA, TPE, TPU) and their mechanical properties to determine ideal tool dimensions
- Performed primary market research, financial modeling, competitive landscape research, and market size evaluation
- Utilized FEA to observe stress concentrations under applied loads and iterated designs to ensure tool longevity

Twin-Tee Filter Circuit

March 2021

- Designed and breadboarded circuit to filter out a band of frequencies, using the notch frequency to target specific range
- Conducted cost analysis on worst-case capacitor tolerances based on LTspice simulations of high-low capacitance cases

SKILLS & INTERESTS

Design/Testing: SolidWorks, Design for Manufacturing, GD&T, Materials Selection, ANSI/ASME Drawing Standards, Fits/Tolerances, Finite Element Analysis, Equipment/Electronics Assembly and Testing, Cycle Time Analysis

Fabrication: 3D Printing, CNC Router, Laser Cutter, Mill, Power and Hand Tools, Welding, Soldering, Woodworking

Software: MATLAB, Arduino, LabView, LTspice, Adobe Creative Suite (Photoshop, Illustrator, Premiere), Microsoft Office

Interests: Illustration, Animatronics, Photography, Hiking, Gardening