

# 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, Woodworking and Metalworking, Electricity and Magnetism, Fluid Mechanics, Mechanics of Solids/Structures, Structural Analysis, Computer Aided Visualization/Design, Electrical Circuits

## 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](http://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](http://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, PicoScope, LTspice, Adobe Creative Suite (Photoshop, Illustrator, Premiere), Microsoft Office

**Interests:** Illustration, Animatronics, Photography, Hiking, Gardening