

# CHRISTINE ZHOU

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## EDUCATION

### Brown University

*Sc.B. Mechanical Engineering | A.B. Visual Art*

May 2023

GPA: 3.83/4.00

**Relevant Coursework:** Sculpture: Conceptual Propositions; Dynamics and Vibrations; Electricity and Magnetism; Fluid Mechanics; Mechanics of Solids/Structures; Structural Analysis; Computer Aided Visualization/Design; Electrical Circuits

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## RESEARCH EXPERIENCE

### Breuer Lab at Brown University

*Research Assistant*

Jan. 2021 – Present

*Providence, Rhode Island*

- Oversee repair of mechanical bat wing design utilizing a cam mechanism, operating with a 3-DOF shoulder and 1-DOF elbow
- Research optimization of bat wing: decrease weight, add ball bearings to cam profiles, replace helical coupling with Rzeppa joint
- Contact parts suppliers to receive quotes on mechanical parts such as 0.01" diameter wire rope, wire rope compression sleeve

### USC Space Engineering Research Center (SERC)

*Manufacturing Research Intern*

Jun. 2020 – Sept. 2020

*Los Angeles, California*

- Iterated 5+ designs of Horizon Drive cavity: splitting into two parts, adding flanges, cut-extruding bolt holes in SolidWorks
- Manufactured Horizon Drive cavity bowl and spikes using SolidWorks CAM, CNC machining, manual mill, and manual lathe
- Served as point of contact with 10+ LA-based metal plating companies for electroless silver plating of Horizon Drive cavity
- Researched Horizon Drive project and quantized inertia theory with a team of 8 to create a propellantless propulsion system

### USC Alfred E. Mann Institute (AMI-USC)

*AMI-USC Summer 2020 Intern*

May 2020 – Aug. 2020

*Los Angeles, California*

- 3D modeled 10+ prototypes and 5+ design iterations of a multifunctional touchless keychain tool, the UtiliTool, in SolidWorks
- Performed primary market research with 10+ people, financial modeling, competitive landscape research, market size evaluation
- Looked into various flexible materials (TPA, TPE, TPU) and their mechanical properties to determine ideal tool dimensions

### Chapman University

*Independent Metal-Organic Framework Researcher*

Sept. 2017 – Jun. 2018

*Orange, California*

- Filed provisional patent for original idea of metal organic framework compounds used for fire extinguishment in Sept. 2018
- Presented research presentation and poster at GENIUS Olympiad from June 10-16, 2018, winning a Bronze Medal in Science
- Researched fire extinguishment methods using MgEDTA and CuEDTA metal-organic frameworks (MOFs) to adsorb oxygen
- Performed compound analyses by designing a closed system with an oxygen concentration meter and reading absorption spectra

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## LEADERSHIP EXPERIENCE

### Brown Student Agencies (BSA)

*Marketing Manager and Graphic Designer*

Feb. 2020 – Present

*Providence, Rhode Island*

- Design and create marketing materials (flyers, posters, banners, signage, brochures) with Photoshop, InDesign, and Lightroom
- Handle interactions between Brown University and local businesses including OCM Linens, Knead Donuts, Kaplan Test Prep
- Manage BSA Instagram (500+ followers), Facebook page, and website while communicating with BSA Marketing Director

### Brown Space Engineering (BSE)

*Manufacturing Team Member*

Jan. 2021 – Present

*Providence, Rhode Island*

- Brainstorm PVDX satellite's robotic arm design and folding mechanism with a team of 8 to satisfy NASA launch requirements
- Attend BSE meetings 2+ times a week to refine design of PVDX satellite, communicating with Avionics and Payload subteams

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## PROJECTS

- Coded a **lunar impact mission** in MATLAB using event and ODE functions to determine potential impact dates and velocity
- Built a wooden **height-adjustable lamp** utilizing a four-bar chain mechanism and a hand-illustrated koi design for lantern
- Designed and developed a **touchless keychain tool**, making 10+ design iterations and performing secondary market analysis
- Built a **kinetic wave sculpture** studying cam theory and shadow-casting techniques to project underwater simulation onto walls
- Used 5-gear mechanism and household supplies (cardboard, rubber bands, chopsticks, Li-ion battery) to create a **walking robot**

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## SKILLS AND INTERESTS

**Technical:** Adobe Suite: Photoshop, InDesign, Lightroom, Illustrator, Xd; Microsoft Office: Word, Excel, PowerPoint, Access  
MATLAB, SolidWorks, NX, 3-D Printer, Laser cutter, CNC, Manual mill, Manual lathe, Drill press, Hand drill, Circular saw, Bandsaw, Spot welding, Plasma welding, Soldering, qPCR, NanoDrop, Flow cytometry machine, Centrifuge

**Languages:** English (native), Spanish (conversational), Chinese (proficient)

**Interests:** Drawing storybook-style illustrations, Badminton, Photography (Nikon D3500), Gardening, Animation, Museums, 1010!