Zack Cheng

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EDUCATION

Brown University, GPA: 4.0 / 4.0   **Providence, RI | Class of 2023**

- Sc.B. in Computer Engineering. concurrent Sc.M. in Computer Science (Visual Computing).
- *Relevant Coursework:* Interactive Graphics, Software Engineering, Computer Vision, Computer Networks, Computer Systems, Digital Electronics and Computer Systems Design, Programming Languages, Communication Systems, Human Factors.

EXPERIENCE

Government Technology Agency   **Singapore**

Frontend Developer Intern, Government Digital Services   *May 2021 – August 2021*

- Redesigned, then developed a website used by thousands of unique monthly visitors to find and apply for support programs.
- Built a complete library of reusable **React** components for user input and interaction, using **Typescript** and **styled-components**.
- Devised and implemented a **data pipeline** + **CMS** to automate deployment of dynamic, multilingual content and eligibility logic.
- Initiated web accessibility efforts and conducted a workshop to teach **WAI-ARIA** and **assistive device usage** to the project team.
- Wrote extensive unit and end-to-end UI tests with **Jest** and **Playwright**, and served as the team's primary accessibility reviewer.

Full Stack @ Brown   **Providence, RI**

Full Stack Web Developer   *May 2020 – May 2021*

- Created a community Q&A website for Brown University with **HTML**, **CSS**, and **JS**. Designed all wireframes and page flows.
- Assisted in building a backend RestAPI with **Express** for **Node.js**, using **Sequelize** to interface with a **MariaDB** database.

LEADERSHIP

Brown-RISD Game Developers   **Providence, RI**

Executive Board Member   *December 2021 – Present*

- Led a club of **60+ members** making several games from scratch per semester. Oversaw game design and programming in **Unity**.

Brown University Computer Science Department   **Providence, RI**

Head Teaching Assistant, Computer Vision   *October 2021 – Present*

- Led a team of **16 TAs** to improve course instruction and enhance integration of **socially-responsible computing** content.
- Initiated an ongoing project to develop interactive 3D demos with **WebGL** to allow students to better visualize core concepts.

Brown University School of Engineering   **Providence, RI**

Teaching Assistant, Honors Intro to Engineering   *January 2021 – May 2021*

- Mentored **38 students** in an accelerated intro class, holding office hours remotely >2.5h/week across a 12h time zone difference.
- Taught engineering concepts. Guided students through problem sets and numerical computing in **MATLAB** and **Mathematica**.
- Voluntarily extended hours by 6h/week on average to provide targeted help to students, customizing instructional plans for each.

33rd Victoria Junior College Students' Council, Singapore   **Singapore**

Committee Head, Publicity & Communications Committee; Member, Executive Committee   *May 2016 – May 2017*

- Directed media efforts for school events and produced publicity materials. Managed **46 Student Councillors** as the design lead.
- Went beyond assigned responsibilities by conducting **woodwork** training and documenting processes in illustrated guides.

PROJECTS

Planetarium   *December 2021*

- Highly optimized browser-based procedural planet generator and simulation built with **Three.js**. Demo viewable on my website.
- Wrote custom **GLSL** shaders for Perlin noise generation and post-processing, leveraging **hardware acceleration** for efficiency.

Voxel Coloring   *May 2021*

- Implemented **photorealistic voxel scene reconstruction** from images in **Python**. Extended to produce 3D-printable models.
- Method supports arbitrary reconstruction resolution and spatial distribution of cameras, and is robust to noise and occlusions.

Maps   *March 2021*

- **React** map applet with a **Java** backend server, using pathfinding with **Dijkstra's**, nearest-neighbor searching with **k-d trees**, and **server-/client-side caching**. UI is fully **keyboard-navigable** and **responsive**, and features loading states and toast notifications.

SKILLS

Languages & Technologies: Typescript/Javascript, React, HTML, CSS/SCSS, Unity, C#, C++, C, Three.js, Python, Java, MATLAB.
Design & Art: Illustrator, Photoshop, InDesign, Figma, SolidWorks; digital art, traditional wet media, graphite, woodworking.
Interests: *any* form of design, cooking, NYT crosswords, playing/designing games, STEM education, precision drawings.