

# Joey Zhu

<https://joey-j-zhu.github.io/>

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## Education

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### University of California, Berkeley

B.A. Computer Science and Physics

Berkeley, California

Spring 2023

**GPA:** 3.6

**Relevant Coursework:** Data Structures, Algorithms, Stochastic Processes, Linear Algebra and Differential Equations, Information Systems, Computer Architecture, Machine Learning, Electrodynamics, Analytic Mechanics, Quantum Mechanics, Statistical Mechanics, Experimental Instrumentation

## Technical Skills

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**Languages:** Python, Java, C/C++, HTML, CSS, JavaScript, RISC-V

**Frameworks and APIs:** Numpy, Scipy, OpenCV, Tkinter

## Projects

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### Perlin Mapping

*Tune Perlin fractal noise parameters to visually approximate and compress images, and manipulate the resulting to create organic-looking and visually appealing CGI, and applications for CV*

- Lowered squared raster error from 300k to less than 1k for both highly detailed and smooth test images, via gradient descent and error-passing for successive octaves
- Adjusting program and exploring more parameters for gradient descent process to behave more predictably and produce numerically similar parameters for visually similar images or successive frames
- Exploring new methods of manipulating parameters, different color spaces, and naturally arising quad-tree feature structure to improve performance and find broader applications

### Java Version Control System

*Implement a version control system with all the essential functions of Git*

- Compressed repository files by representing successive commits as a sequence of line deletions and insertions
- Successfully merged branches that were already mutually merged on previous commits

### Sorting Hat

*Write a program to bin items to maximize affinity under a aversion threshold, given a set where every two items have a quantified affinity and aversion*

- Found near-constant runtime methods for efficient computations and greedy sampling
- Generated pathologically behaving data to test the robustness of the algorithm and its ability to escape local optima
- Reduced to an equivalent integer linear program as an alternative solution

## Work Experience

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### UC Berkeley EECS Department

Academic Intern

Berkeley, California

June 2020 - October 2020

- Worked with CS 61BL and CS 70 instructors to debug students' labs and give guidance on large projects.
- Designed practice problems for students to prepare for projects and exams.

### UC Berkeley IEEE

Marketing Committee

Berkeley, California

August 2020 - Present

- Led apparel graphic design project and coordinated distribution logistics with executive members.
- Promoted events with tech companies to various student groups on Facebook, Instagram, and Discord.