Zachary Huang

Pasadena, CA

EDUCATION _____

California Institute of Technology

B.S. IN COMPUTER SCIENCE, GPA 4.2 Sep. 2022 - Jun. 2026 **Relevant Coursework:** Software Design, Algorithms, Decidability and Tractability, Systems Programming, Machine Learning, Computational Imaging, Embedded Systems, Discrete Mathematics, Linear Algebra **Involvement:** Undergraduate Computer Science Club (UGCS), Chamber Music, Turtle Club

EXPERIENCE _____

Research - Optical Flow Models for Ionospheric Dewarping	Pasadena, CA
 OWENS VALLEY RADIO OBSERVATORY SOFTWARE & ALGORITHMS LAB Researched dewarping algorithms for the Long Wavelength Array (OVRO-LWA) to correct for refraction Utilized machine learning models and optical flow to visualize structures in the ionosphere Optimized performance using GPU acceleration, processes 4096x4096 px radio images in near-realtime 	Jan 2024 - Aug 2024 n
Research - Type-Checked Mathematical Proofs in LaTeX	Pasadena, CA
 CALTECH SURF UNDER PROF. ADAM BLANK Implemented a tool for type-checking discrete math proofs written in LaTeX using OCaml Meant for use in CS 13 (Introduction to Discrete Math) 	Jun 2023 - Aug 2023
Operating Systems (CS 24) & Discrete Math TA (CS 13) CALTECH	Pasadena, CA Sep 2023 - Present
Personal Projects	
 <u>caltech.dev</u> An Open-Source Caltech Course Scheduler Web Development, React, TypeScript, Tailwind CSS, Vercel, GitHub Scraped course catalog information using Python and developed an interactive UI using TypeScript/Rea Implemented an automatic scheduling algorithm to find sections without conflicting lecture times Adopted by a majority of Caltech undergraduates for its data availability 	Aug 2022 - Present act
 An Interactive Fractal Flame Explorer Computer Graphics, WebGPU, TypeScript, WGSL, Svelte, Vite Uses WebGPU to render fractal flames in the browser in real time (60 FPS) Simulates linear/non-linear mathematical functions using iterated function systems 	Jan 2023 - Present
ZPCalcAn RPN Calculator / Programming LanguageFunctional Programming, Language Design, Interpreters, Metaprogramming• Supports all common math operations, conditionals, looping, functions, structs, and metaprogramming• Inspired by the Forth and Lisp programming languages	Sep 2022 - Present
OPEN-SOURCE CONTRIBUTIONS	
 Ladybird: A truly independent web browser, using a novel C++ engine based on web standards Fixed an issue where large GIFs would crash the image decoder process Passerine: a concise, extensible functional scripting language powered by Rust Refactored the core parser used by the language 	;

SKILLS _____

Programming Languages	Python, C/C++, TypeScript, JavaScript, OCaml, Common Lisp, Java, Rust, Julia, Lua, HTML/CSS, LaTeX
Libraries	PyTorch, OpenCV, NumPy, SciPy, Matplotlib, Pandas, JAX, Flask
Tooling	(Neo)vim, git, ssh, tmux, make, coreutils, Linux, MacOS
Awards	Caltech SURF Fellowship (2023, 2024), National Merit Scholarship (2022), USACO Gold (2021),
	AIME Qualifier (2021)