CAROLYN RUAN

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EDUCATION

Caltech, Pasadena, CA — Expected 2027

Bachelor of Science, Computer Science

GPA: *4.07*

Minor in Mathematics; Information + Data Science

Relevant Coursework: *Data Structures, Software Design, Theory of Computation, Discrete Mathematics, Linear Algebra, Calculus, Computational Methods, Pedagogy in Computer Science*

Activities: *NCAA Women's Basketball, Lloyd House, Poker Club, Student IT Rep, First-Year Orientation Leader*

SKILLS

Technical Skills: *Java, Python, C, C++, HTML/CSS, Matlab*

Technologies/Frameworks: *Git, Bash, Conda, React*, *Pandas/NumPy/scikit-learn/matplotlib*

EXPERIENCE

Machine Learning Researcher, Reisman Lab at Caltech — Jan 2025 - Present

- Developed model evaluation framework and stopping criterion for Random Forest active learning models to predict regioselectivity in C–H oxidation reactions.
- Deployed rerunning of regressor models using GPU parallelization, cutting model evaluation time by 93%.
- Awarded Caltech's 2025 Summer Undergraduate Research Fellowship.
- Submitted to NeurIPS AI for Science workshop.

Jane Street WiSE Program — July 2024 - Aug 2024

- Highly selective 4-day program in game theory, strategic trading, and quantitative finance.

Hampshire College Summer Studies in Mathematics — Jun 2023 - Aug 2023

- Summer math program with an entrance test and <7% acceptance rate.
- Studied proof-based number, group, and graph theory, with concentrations in probabilistic modeling, Dirac delta function, and harmonic series for 8 hrs/day.
- Covered guest lectures and events in the program newspaper.

Software Engineer Intern, Blueprint — Jan 2022 - Apr 2022

- Collaborated with a team of UC Berkeley CS graduates and interns to develop a user interface framework with React components for a Y-Combinator health tech startup.

PROJECTS

Axe-throwing Video Game (C, Git, Makefile, SDL2) — June 2025

- Two-player axe throwing game with intelligent in-game obstacles. Led team of 3. Awarded A+.
- Developed 2D discrete physics engine with support for multi-object kinematics and collision detection.
- Designed generalized, memory-compliant C-libraries using AddressSanitizer for vector math, image rendering, animation, keyboard handler, and music and sound effects handler.

Light Painting Robot Arm (hackaday.io/project/202243-light-painting-robot) — Mar 2025

- 3-DOF robot arm that light paints with LEDs in a vertical 2D plane, using a Raspberry Pi Pico.
- Implemented Holistically-Nested Edge Detection (HED) deep-learning model to translate user-inputted images into vector paths for the robot to follow.
- Presented at Los Angeles Maker Faire and City of STEM.

HONORS AND AWARDS

- Philip Laipis in Memory of Professor Jerome Vinograd Research Fellow
- US Presidential Scholar Candidate
- 2x AIME (American Invitational Mathematics Examination) Qualifier
- Berkeley Math Tournament Honorable Mention
- USACO (USA Computing Olympiad) Silver
- Presidential Volunteer Service Award