Jeffrey Fan.

I make apps, art, robots, and more.

An aspiring student looking to build things with the fundamentals of biology, chemistry, physics, and computers. Ready to make more tools for more people.

EDUCATION

2022 – 2026
Palo Alto High School

- GPA: 4.0 / 4.0

SKILLS

Programming

- Python
- Numpy
- SciPy
- Tkinter
- PyGame
- JS
- TS
- HTML
- CSS
- NodeJS
- ElectronJS
- ThreeJS
- Redux
- React
- RTKQ
- Tailwind
- Java
- OOP
- GLSL

Physics

- Newtonian
- Lagrangian

General Biology

General Chemistry

Graphic Design

WORK EXPERIENCE

➤ **Lawrence Berkeley National Laboratory** Feb 2024 – Nov 2025

Paid Student Research Assistant

- Operated on a large scale with supercomputing to evaluate mathematical optimization tasks
- Performed geometric optimization and frequency analysis of molecules to determine reaction efficiency
- Worked on a succinct CL tool for batch submitting and tracking repetitive tasks to Slurm
- Performed statistical analysis of DNA structures using alternate coordinate representations to determine their forms

➤ **A0 Systems – Hopper Division** Jun – Aug 2025

Paid Intern

- Worked on front-end with React, Redux, and Tailwind
- Refactored and improved the robustness of the entire UI framework, fixed countless bugs and inefficiencies
- Average PR had less than -500 in line count with functional and maintenance improvements

RESEARCH EXPERIENCE

➤ **IsPETase Optimization** @ LBNL Jan – Oct 2025

- Ran molecular geometry optimization and vibrational analysis to determine reaction energies and favorability
- Discovered and proved certain enzymatic-enhancing mutations
- Analyzed existing literature to provide new research directions and future biochemical experimental confirmation

AWARDS

- FRC Autonomous Award
- USACO Silver
- AIME Qualifier
- Congressional App Challenge Honorable
- FIC Honorable
- SVTT Honorable
- Paly Science Award
  - Biology H
  - Chemistry H
  - AP Physics C
- Congressional Art Competition Honorable
- Scholastic Art Gold Key
- Scholastic Art Silver Key
- PVSA

LANGUAGES

English – Fluent
Spanish – AP
Chinese – Fluent

LEADERSHIP

- Software Captain @ FRC
- Group Lead @ COSMOS
- CTO and Group Lead @ Noteblast, ACF
- Lab Group Lead @ SSSIP

EXTRACURRICULARS

FIRST Robotics Competition — 2023 – Present

Software Captain of 6036

- Management of a team of over 30 software recruits
- Robot competes in 3 annual regionals
- 2025: Top 15 in California, top 120 in the world
- Created a robust robot development environment
  - Necessary debugging and tuning tools built in for rapid testing in the short 2-month season
  - Modularity and collaboration-focused software architecture promotes sustainability
  - Versatile custom library speeds up development tenfold
- Created a front-end application for interaction with the robot during a competition
- Developed an entire scouting system for information gathering during FIRST competitions

COSMOS UC Davis – Computational Biology — July 2024

Group Lead

- Led a group of 4 through modeling numerous biological systems
- Created a front-end application capable of simulating numerous mathematical models
  - Fitz-Nagumo neuron and heart action potential model
  - Gierer-Meinhardt animal coat pattern formation model
  - Boid and Viseck flocking model
- Presented an analysis on Gierer-Meinhardt pattern amplification frequency related to initial empirical model parameters to professors
- Wrote a write-up of our discoveries and learning process

Applied Computing Foundation (ACF) – NoteBlast — 2022 – 2024

CTO and Group Lead

- Solely created a full-stack application called Noteblast, providing musicians with free instrument tuning and built-in sightreading gameplay
- Congressional App Challenge Honorable mention
- SVTTT 9th Summit participant
- FIC Honorable mention
- Author of a published paper about music and education sustainability in JSR

Stanford Summer Science Internship Program (SSSIP) — July 2023

Lab Group Lead

- Led a lab group of 4 through experiments and data gathering
- Organized and designed the final presentation for Stanford professors
- Developed an image processing algorithm (and later an app) to count transfected cells, which surprised camp mentors

PROJECTS

PeninsulaPortal

A complete FRC robot diagnostic and debugger, path generator, and competition pit display. Sleek, navigable design focused on user experience. Full end-to-end development from back-end servers to front-end applications.

NoteBlast

A sight-reading rhythm game to help musicians practice! Comes with a built-in free tuner to provide feedback on the accuracy of your instrument

Merge Game

A fun 2048-like Chrome extension about merging shapes to create higher tiers. A good offline way to enjoy some downtime. Boasting over 3.6K installations in total and over 700 monthly users.

CellLuminex

A fluorescent cell counter and calculator, able to distinguish immunofluorescently-stained cell images.

Portfolio V3

My third iteration of my portfolio website. Built using a variety of frameworks, including React, Vite, TailwindCSS, and Framer-Motion.

Portfolio V2

My second iteration of my portfolio website. Built using TS, HTML, and CSS, but no other frameworks.

Portfolio V1

My first iteration of my portfolio website. Built using basic HTML, JS, and CSS.

Biotech Sandboxes

A sandbox environment where I simulated some mathematical models of biological systems! Notable models include Gierer-Meinhardt and FitzHugh-Nagumo.

pPatrol

2024 FRC Crescendo web scouting application linked with PythonAnywhere simple Flask backend.

Celestial.py

A top-down space shooter game where you defeat asteroids and enemies. Includes in-house self-developed PyGame game engine.

Celestial.js

A top-down space shooter game where you defeat asteroids and enemies. Includes in-house self-developed JavaScript game engine.

BlobBlast

A unique pixel shooter game with interesting movement mechanics. Includes in-house self-developed PyGame game engine.

VOLUNTEERING

- **ACME Education Group** – *150+ hr, 4 mo*
  - Volunteered at a local education group during the summer
  - Provided teaching aid and general guidance for elementary schoolers
  - Became a favorite among the kids
- **Peninsula Academy: Build-a-Bot** – *150 hr, 3 wk*
  - Volunteered at robotics team summer outreach program as counselor lead
  - Guided middle schoolers towards building a fully functioning FRC robot
  - Taught software and Java basics, and basic motion control theory
- **Peninsula Academy: Fall Classes** – *50 hr, 10 wk*
  - Volunteered at robotics team fall classes as sole programming teacher
  - Designed a comprehensive curriculum from zero programming experience to a fluent Python programmer
  - Of the three fall classes offered, this course received no negative reviews

PUBLICATIONS

1 **Fan J**, Ha Y, Active Site Local Environment Allows Acidic and Basic Synergy in Enzymatic Ester Hydrolysis by PETase, In preparation

2 Wang W, Liu Z, Zheng L, Shi Y, Manzo-Casio E, Shi S, **Fan J**, Zhou D, Wang W, Zhang X, Yang Y, Too rigid to strike: Excess desmin at Z-discs underlies a restrictive cardiomyopathy in GAN mice, Circulation Research, Under review

3 **Fan J**, Ha Y. Micro- and Nanoplastics and the Immune System: Mechanistic Insights and Future Directions. ***Immuno***. 2025; 5(4):52. https://doi.org/10.3390/immuno5040052

4 Rong Z, Hong LG, Huo YY, Li J, Zheng DQ, Ha Y, **Fan J**, Xu XW, Wu YH. Molecular Insight Into the Hydrolysis of Phthalate Esters by a Family IV Esterase. ***Environ Microbiol***. 2025 Jul;27(7):e70134. doi: 10.1111/1462-2920.70134. PMID: 40600832.

5 Kang A*, **Fan J***, Battulga A, & Choi H. Addressing the Issue of Musical Education through Gamified Tuning Analysis. ***Journal of Student Research*** 2024, 13(1). https://doi.org/10.47611/jsrhs.v13i1.6235 * Equal contribution

6 Mai G, **Fan J**, Mai B, & Fan X. Effect of Music Therapy on Alzheimer's Disease: How Music Combats Alzheimer's Disease?. ***International Journal of Innovative Research in Medical Science***. 2023, 8(07), 279–286. https://doi.org/10.23958/ijirms/vol08-i07/1702

PATENTS

• Jeffrey Fan, Yang Ha. 2025. "Engineered PETase Variants and Methods for Enhancing Ester Hydrolysis via Acidic-Basic Synergistic Local Environments." U.S. Patent 63/913,260, Provisional.

BOOKS

• Hand-drawn comic book series (3 parts)
• Personal art showcase book collection (2 parts)