

LUCAS AVERY LUM

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EDUCATION

The Harker School, San Jose, CA | Class of 2027 | **GPA:** 4.36 W / 3.96 UW

- **SAT:** 1550 | **ACT:** XX
- AP Scholar with Distinction (2025)

SKILLS

Programming Languages: Python, C/C++, Swift, Java, HTML, JavaScript

Dev Tools & Environments: Xcode/Storyboard, Jupyter Notebook, Google Colab, Google Gemini

Foreign Language
Japanese (Level 3)

Frameworks & Libraries: Flask, Firebase, RapidAPI, Scikit-learn, Hugging Face, SwiftUI

Lab & Technical Tools: SimulATe, LaTeX

Productivity: Google Workspace, Microsoft Office

RESEARCH AND INTERNSHIP EXPERIENCE

University of California, San Francisco (UCSF) TECH Lab, San Francisco, CA, Sep. 2025 - Present

Research Intern (Advisor: Dr. Peter Washington, Associate Professor, UCSF School of Medicine)

- Building frontend and ML features for a “Human-In-The-Loop” AI for digital remote diagnostics gamified web platform co-led by Dr. Peter Washington (UCSF) and Dr. Dennis Wall (Stanford), integrating crowdsourcing algorithms with ML-based behavioral feature extraction to improve joint prediction of autism spectrum disorder (ASD) and attention-deficit hyperactivity disorder (ADHD).
- Accepted as the only high school student on a globally distributed team of university students, postdoctoral researchers, and software developers based in California (UCSF, Stanford University, UC Berkeley), Hawaii (University of Hawaii at Manoa) and India.

Stanford Clinical Summer Internship (CSI), Stanford, CA, Sep - Nov. 2025

Clinical Intern (Faculty: Dr. Takudzwa Shumba and Dr. Saloni Maharaj)

- Engaged in a hands-on medical curriculum with lectures and practicals across primary care, cardiology, endocrinology, nephrology, plastic surgery and pulmonology. Practical: Simple interrupted suture and knot tying, injections, vitals and history taking and SOAP, kidney dissection and anatomy, AI in medicine, etc.
- Delivered a capstone presentation on atrial fibrillation to XX audience, including YYY.

University of California, Santa Barbara (UCSB), Santa Barbara, CA, Jun - Aug. 2024

Summer Research Intern (Advisor: Dr. Kirstin Rollins, PhD)

- Studied microbiology and bacterial anatomy, focused on their ability to form biofilms and interact with antibiotics. Conducted Kirby-Bauer disc diffusion test to measure the inhibitory effects of antibiotics on the growth of bacterial cultures.
- Analyzed bacterial genomes to predict pathogenic traits and antibiotic resistance, outbreak prevention and potential improvements in interventions.
- Presented at UCSB Symposium a research thesis and investigated the effects of single vs. cocktail antibiotic treatments on the gut microbiome across 3 gut enterotypes at 8 concentrations using the SimulATe model, and produced a detailed quantitative analysis. ([Github](#))

PUBLICATIONS

- Patel, A., **Lum L.**, Iyer, N., Rollins, K. (2025) “Simulating the Effect of Single vs. Cocktail Antibiotic Treatments on the Normal Flora in the Human Gut Microbiome.” *Journal of Emerging Investigators*. Under review.

APPLICATION DEVELOPMENT

AI-Powered Solutions, 2025 - Present

- **CogniPlay:** Creating an iOS app for cognitive assessment and impairment detection using deep-learning of multi-modalities spanning speech analysis, gamified cognitive assessments and wearable sensor data. ([Github](#) | [Demo](#))

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- **VocabCoach:** Launched an AI-powered iOS app that helps students build and retain vocabulary through personalized practice, real-time smart feedback, and progress tracking. ([Download](#))

Single and Multiplayer Games, 2022 - Present

- **TetrisMP:** Redesigned TETRIS to be a shared keyboard game for multiple concurrent players. ([Github](#))
- **SnakeMP:** Rewrote the single player game, Snake, to allow several players competing peer-to-peer against each other. ([Github](#))
- **Bughouse:** Contributed enhancements to a custom version of Bughouse Chess, developed by amatveiak. ([Github](#))
- **DiepTD:** Developed a custom-built tower defense game motivated by the graphics and mechanics of the browser game, diep.io. ([Github](#))

COMMUNITY LEADERSHIP AND VOLUNTEERING

Inspira Foundation Inc. - Los Altos, CA | www.inspirafoundationinc.org

Co-founder / Co-President, Jul 2025 - Present

- Co-founded a student-led 501(c)(3) nonprofit organization committed to empowering students through delivering accessible, hands-on STEM education, providing simplified and accurate scientific information, and sharing research and innovative solutions that benefit the public.

Silicon Valley Youth (SVY) - Cupertino, CA | www.siliconvalleyyouth.com

- **VP of Mathematics**, Jan. 2025 - Present: Oversee course quality and logistics, train new instructors, liaise between staff and SVY executives, and foster team cohesion and conflict resolution. The department consistently leads in enrollment every semester.
- **STEM Coach**, Jun. 2023 - Present: Designed curriculum and taught 65+ elementary and middle school students over five semesters in competitive math and Python programming courses not offered in schools. Donated all tuition proceeds to underprivileged districts such as Ravenswood City School District.

The Harker School - San Jose, CA

Math Club - Problem Writer, Aug. 2023 - Present

- Wrote contest problems and solutions for the *Harker Math Invitational (HMI)* and coached Middle School students for different math competitions. Also, proctored and graded at MathCount (local/state) and HMI.

Oeconomia- Editor, [The Oeconomist](#), Aug. 2025 - Present

- Published monthly articles around US and global economies through a school-wide newsletter called [The Oeconomist](#), operated by Harker's student-run Economics organization, Oeconomia.

Chess Club - Officer, Aug. 2025 - Present

- Fostered a community that promotes chess as a unifying game for both beginners and advanced players, encouraging problem-solving, and learning through play and tournaments.

Harker Orchestra - Associate Principal Violinist, Aug. 2023 - Present

- Performed with the Chicago Symphony Orchestra (2025) and in regular concerts for local communities; volunteered through Tri-M Music Honor Society and previously through Palo Alto Chamber Orchestra.

AWARDS AND HONORS

- **Programming:** USACO Silver division; ACSL Finalist (2x); HMI 2024 - 1st Place
- **Mathematics:** AIME qualifier (4x); AMC 10 Top 5% (4x)
- **Writing:** Scholastic Art & Writing Contest 1x Gold key (25'), 2x Silver key (24', 25')
- **Community Service:** President's Volunteer Service - 2x Gold Award (23'-24', 24'-25')