Jacob Schuster

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EDUCATION

California Institute of Technology, Pasadena, CA; GPA 4.1
BS, Computer Science/Mechanical Engineering expected June 2026

Polytechnic High School, Pasadena, CA, June 2022; GPA 4.28; ACT composite 36; AIME Qualifier; Co-captain Robotics Team (VEX robots using Arduino software); Math Team; Science Olympiad: Codebusters; Varsity Badminton (Coaches' Award recipient); Varsity Fencing

SCIENTIFIC RESEARCH EXPERIENCE

Caltech: *Bio-inspired Engineering Researcher*, Awarded John and Barbara Gee SURF Fellowship for summer research, July – September 2023: Re-designed, constructed, and tested a robotic fish to study fin trajectories in order to find an improved method of underwater propulsion; developed and integrated Arduino and Matlab software to perform movements and collect data. Supervised by Morteza "Mory" Gharib, PhD, & Meredith Hooper, PhD student

Caltech: *Solar Hydrogen Activity Researcher*, October 2020 – May 2022: Tested metal oxides in order to find a semiconductor to generate hydrogen fuel to combat climate change; built a microbial fuel cell to create energy using organic materials (high school student program at Caltech)

University of Cambridge: *Bio-inspired Engineering Researcher*, June – December 2021: Worked with Cambridge professor and PhD student to research the replication of biological functions found in the natural world; adapted a computer simulation of bacteria movement to improve soft robots' delivery of medicine in the body using MATLAB

UC Santa Cruz: *Pinniped Lab Researcher*, June – August 2021: Studied pinniped behavior by reviewing, analyzing, and giving presentations on journal articles covering pinnipeds; processed and summarized cardiorespiratory data by analyzing videos of the lab's walruses, seals, and sea lions; presented findings to professors and graduate students

UC Irvine: *Khine Lab Research Intern*, Summer 2019: Tested wearable health sensors' resistance due to size/material variations; analyzed data to develop monitoring solutions that optimize accuracy of resistance measurements, scalability, and accessibility; presented findings to professors and graduate students

PUBLICATIONS

Schuster, Jacob, "Humans are Developing Technology that Mimics What Nature has been Doing for Years," *National High School Journal of Science*

Schuster, Jacob (co-author), "Optimizing Motion of Lophotrichous Bodies," published by the *International Research Journal of Modernization in Engineering Technology and Science*

ADVANCED MATH EXPERIENCE

Williams College: *PZ Math Camp: Number Theory & The Art of Mathematical Thinking,* Summer 2020
Hampshire College: *Summer Studies in Mathematics,* Summer 2020

TECHNICAL SKILLS

Experienced in Python, Java, C, MATLAB, SolidWorks; experienced in data analysis (Python libraries: numpy, scikit-learn, matplotlib), machine learning, and prototyping from design through implementation

EXPERIENCE

LA Zoo Student Docent (60 hours of training; 120 volunteer hours giving tours, answering questions, and presenting Teen Talks); and Salesperson and Silk Screener at Hook T-Shirt Shop in Provincetown, Massachusetts