

SAM VILLA

Undergraduate Mechanical Engineering Student

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San Luis Obispo, California

PROJECTS & RESEARCH

Origami-Inspired Pneumatically Actuated Soft Robotic End Effector

Cal Poly Mechanical Engineering

February 2025-Present

- Developing a novel manufacturing technique for soft robotic grippers that integrates computational origami with soft robotics.
- Using laser cutting for rapid prototyping to test foldable structures at multiple scales to achieve high-powered, customizable end effectors.

Origami and Kirigami Kinetic Structures

National Science Foundation/Cal Poly Architecture

October 2025-Present

- Imparting biases in materials with perforations to tune buckling characteristics of thin sheets to create predictable lighting patterns for use in building facades.
- Developing systematic methods for assessing light transmission characteristics of various test subjects.

Running Biomechanics Research

University of Massachusetts

June 2025-September 2025

- Developed a protocol to safely and accurately assess the impact of different lighting characteristics on trail running.
- Wrote programs to analyze output data of sensors including inertial motion units, and load cells.
- Learned how to conduct various tests including metabolic rate, motion capture, and in field IMU data collection.

WORK EXPERIENCE

Freelance Photographer

Self Employed

April 2023 - Present

Boston, MA

- Manage multiple national clients: Boston Marathon, New Balance, Tracksmith Running, & more
- Developed, pitched, filmed, and published projects for audiences of over 400k+

Part Time Bike Mechanic and Sales Associate

Fast Splits Precision Multisport

April 2022 - Present

Canton, MA

- Ensure and maintain cleanliness and working order of bikes in a timely manner
- Certified Shimano S-Tec and Sram University Technician

OVERVIEW

An interdisciplinary engineering student with a passion for innovation and research driven by a curiosity and interest in the world around us.

EDUCATION

BS Mechanical Engineering |
Photography Minor | 3.48 GPA

California Polytechnic State University

September 2024 - June 2028

High School Diploma

Needham High School

September 2020 - June 2024

INVOLVEMENT

Cal Poly Distance Club

Fundraising Chair

Cal Poly Cycling

Cal Poly Bike Builders

Running Camp Counselor

Northeast Kingdom Running Camp

Spike Cancer Fundraiser

Founder | \$20,000+ Raised

Needham High School Origami Club

President

SKILLS

SolidWorks

3D Modeling

Python

Qualisys Motion Capture

MatLab

Rapid Prototyping

Rhino Grasshopper

FEA

Spanish

German

INTERESTS

Soft Robotics

Computational Origami

Biomechanics

Architecture

Computational Design