

Aakarsh Sangar

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EDUCATION

Purdue University

West Lafayette, IN | Aug 2026 - Present

First-Year Engineering; Intended B.S. Mechanical Engineering

Canyon Crest Academy

San Diego, CA | Diploma, 2026

17 APs including Calculus BC, Physics C: Mechanics, Physics C: E&M, Physics 1/2, Statistics, Computer Science Principles

EXPERIENCE

ModalAI

San Diego, CA | Sep 2024 - Jan 2025

Drone Hardware & Computer Vision Intern

- One of three interns on a pre-release Stinger VisionM FPV kit spanning hardware bring-up, companion-computer software, and customer documentation.
- Integrated and configured VOXL SDK 1.4.5; stood up onboard computer vision for limited classroom object recognition.
- Wrote the kit instruction manual for assembly and first bring-up, translating early hardware/software setup into repeatable user documentation.

FIRST Tech Challenge 18263 HIGH VOLTAGE

San Diego, CA | 2020 - May 2026

CAD Lead, Build Team

- Led Onshape CAD and mechanical iteration on a multidirectional chassis with PID stabilization.
- Integrated AprilTag localization and kinematics-based turret aiming on the competition robot.
- Awards include 2x Design Award winner, Motivate Award winner, Innovate Award winner, 2025 California-San Diego Championship Design Award, and Inspire Award 3rd Place, Descartes League.

Lightbulb Initiative

Nov 2024 - Present

Founder & Co-President

- Founded a 501(c)(3) STEM education nonprofit and ran virtual workshops with partner schools in four countries.
- Built curricula in Scratch, Tinkercad circuits, and Onshape CAD; raised \$10,000+ for materials and kits.

Canyon Crest Academy

San Diego, CA | Aug 2025 - Dec 2025

Teaching Assistant, Advanced Engineering

- Mentored students in Onshape, circuit design, Arduino, and structured engineering problem-solving.

PROJECTS

Actuator Study & Simulated Arm | UCSD faculty-guided; Onshape, URDF, PyBullet

Sep 2025

- Compared servo, stepper, BLDC, pneumatic/hydraulic, and series-elastic actuators across torque density, controllability, power, and integration.
- Exported an articulated Onshape arm to a URDF tree and validated joints, axes, limits, and mesh frames in PyBullet.

Planetary-Drive Robotic Arm | Onshape, ROS 2

Jul 2026

- Modeled a custom planetary-drive actuator around the torque envelope for robotic arm joints.
- Built a ROS 2 simulation with independently actuated base, links, wrist, and gripper.

rPPG Pulse Pipeline | Cal Hacks AI (Berkeley)

Jun 2026

- Built a video-to-pulse pipeline with face ROI tracking, color-channel preprocessing, temporal filtering, and pulse extraction.
- Designed the signal workflow around motion and illumination noise in webcam-based measurements.

Faultline | CalHacks AI; Python, LLM APIs, AI agents, information retrieval

2026

- Developed a multi-agent research assistant to analyze academic literature and identify conflicting claims between papers.
- Built LLM workflows to retrieve papers, summarize findings, compare methodologies, and propose validation experiments.

TECHNICAL SKILLS

Languages: Python, C/C++, Java, Arduino

Robotics & CV: ROS 2, URDF, PyBullet, VOXL SDK, PID, AprilTag, onboard object recognition

CAD & Hardware: Onshape Certified, actuator/transmission selection, planetary drives, circuit design

Signals & AI: rPPG, temporal filtering, multimodal vision APIs