

Siddharth Zalavadia

Mechanical Engineer

San Francisco Bay Area

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EDUCATION

University of California, Los Angeles (UCLA)

M.S. in Mechanical Engineering, Departmental Scholar

B.S. in Mechanical Engineering

Sept. 2020 – June 2025

GPA: 3.8

GPA: 3.7

SKILLS

Environments: SolidWorks, MATLAB, Linux, Git, Arduino, Raspberry Pi, STM32, Ansys FEA

Manufacturing: Mill, Lathe, 3D Printing, CNC, Laser Cutter, Soldering, Electronics Assembly

Programming: Python, C/C++, MATLAB, Bash, Java

EXPERIENCE

Structures-Computer Interaction Lab

Los Angeles

Engineering Research Intern

June 2023 – Dec. 2024

- Built and prototyped electro-mechanical systems for research in soft robotics using SolidWorks for design, 3D-printing and hand tools for manufacturing, SPI/I2C communication for sensing, and embedded C/C++ for firmware/control
- Published and presented paper in IEEE's RoboSoft 2024 exploring attitude adjustment of bi-flagellated soft robots
- Implemented workflow utilizing OpenCV and Bluetooth communication between embedded C++ and Python for collecting inertial data from differential-drive robot swarm for neural net training of low-drift inertial navigation system
- Designed and assembled handheld rigid buoyancy engine capable of traversing 1 meter vertically in high-viscosity liquid glycerin in about 8 seconds using 3D-printed, threaded shells with space for a liquid-proof O-ring seal
- Managed complex assemblies in SolidWorks and developed robust workflow for making changes to components
- Implemented various communication protocols such as SPI, I2C, UART, and BLE to achieve high-frequency polling
- Sourced and selected actuators, sensors, and materials informed by hand calculations of mechanisms and SolidWorks FEA
- Simulated robotic motion and kinematics with MATLAB and implemented optimized path-finding with collision avoidance
- Maintained and troubleshooted Prusa MK3S 3D-printer to ensure additive manufacturing reliability for rapid prototyping

Bruin Racing SAE Supermileage

Los Angeles

Lead Powertrain Engineer

June 2022 – June 2023

- Managed team of 6 engineers working on prototype combustion drive train and transmission optimized for fuel efficiency
- Performed risk assessment, failure analysis, and quality audits on various vehicle components for competition readiness
- Achieved gas mileage of 422 mpg in UCLA's first complete technical inspection and run at Shell Eco Marathon since 2017
- Trained 20+ members for automotive engineering and rapid prototyping process using CAD, simulation, and 3D-printing
- Oversaw inter-disciplinary projects integrating electronics and sensors alongside mechanical powertrain components
- Sourced and implemented cost-efficient parts for 100% modular fuel pressurization system to enable ease-of-use
- Reduced throttle dead zone by 90% with custom mechanical throttle between modified brake lever and GX50 engine
- Worked with manufacturing shops to obtain parts requiring specialty processes such as water jetting, welding
- Improved documentation process with project management tools (Trello, Google Drive), standardized BOMs, and engineering drawings to facilitate organization and efficient transfer of knowledge between generations.

Powertrain Engineer

Sept. 2021 – June 2022

- Manufactured sheet metal guards for moving parts designed in SolidWorks to ensure safety in case of catastrophic failure
- Produced engineering drawings following GD&T standards for manufacturing of flywheel and power transmission
- Designed and manufactured mounting system for flywheel and starter motor, ensuring alignment and durability
- Machined powertrain components such as flywheel standoffs on lathe, engine mount mass reductions on 3-axis mill
- Thermo-formed PETG for vehicle windows and prepared chassis for carbon fiber layup of body simulated in FEA

PROJECTS

Air Hockey Robot Arm for MAE 263C: Control of Robotic Systems

Mar. 2025 – June 2025

- Implemented closed-loop inverse dynamics control of 2-DOF planar robotic air hockey arm with Python and UART
- Utilized OpenCV data collection and processing from camera to inform arm behavior and generate trajectories

Whiteboard Clock Robot Arm for MAE 263A: Kinematics of Robotic Systems

Sept. 2024 – Dec. 2024

- Developed Python script for open-loop control of 4-DOF robotic arm to continuously write and update current time

Botanist Rover for Bachelor's Final Capstone Group Project

Jan. 2024 – June 2024

- Programmed Raspberry Pi on 5-DOF mobile gardening robot with lift, spout to water pots identified by OpenCV