Aditya Rao

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Education

University of California, Los Angeles (UCLA) — Los Angeles, CA
Bachelor of Science, Computer Science and Engineering — *Expected June 2026*

- Coursework: Object Oriented Programming, Computer Architecture, Logic Design, Embedded Systems, Signals

Experience

ELFIN CubeSat — June 2024 – Sep 2024
Embedded Software Engineering Intern — *Los Angeles, CA*

- Design systems architecture and lead 5 developers via Agile for interfacing device used in future NASA missions
- Innovate software-driven 25-way adapter for bidirectional data transfer between vehicle and payload transceivers
- Write device drivers firmware in C, referencing chip architecture/datasheets to maximize transmission efficiency
- Achieve 100 Mbps bitrate between any pairings of CAN, Ethernet, SpaceWire, RS485, RS232, and RS422 protocols
- Optimize RAM/flash storage of 75 user-selections from GUI; enable user configuration with dockerized RabbitMQ
- Incorporate GitLab deployments and CI/CD pipeline via Jira to automate unit/integration/end-to-end/HIL testing

UCLA Rocket Project — Sep 2023 – Present
Lead Software Engineer — *Los Angeles, CA*

- Manage SDLC between cross-functional Scrum teams pioneering development of flight throttling systems in C++
- Transmit via WiFi at 1,000 Kbps over 400 ft after aggregating SPI, I2C, Serial, and ADC data to Raspberry Pi
- Incorporate P&ID models and graphs into Python GUI with Synnax API for visualization of data and automation
- Integrate user input into ground support GUI, allowing full control of LOx-Ethanol system during 15 static fires
- Automate fill and countdown processes with constant cross-system checks; enable emergency manual override
- Facilitate downlink signal reception and processing to display predicted and live trajectories for 55,000 ft launch
- Reduce database storage latency by 250% for ground support and avionics/telemetry data from microcontrollers

SRI Lab — Nov 2023 – May 2024
Machine Learning Researcher — *Los Angeles, CA*

- Quantified risk of natural disasters by training custom CNN model with semantically segmented satellite imagery
- Integrated novel implementation of U-Net on Python's ArcGIS API for processing data, increasing accuracy by 9%

Projects

RaPID — Apr 2024 – May 2024
Feedback control system for autonomous car

- Programmed mixed-signal MCU car to autonomously drive along 40 ft track, avoid obstacles, and detect collisions
- Implemented PID control algorithm, using readings from 8 infrared sensors, for precise wheel control and navigation

EyeWalk — Nov 2023 – Jun 2024
Wearable device with embedded AI

- Created Raspberry Pi-based device to aid the navigation of the visually-impaired via sensors and camera hardware
- Incorporated FreeRTOS driven prioritization of audio/haptic feedback to report obstacle distances and properties
- Developed computer vision algorithm employing YOLOv6 through OpenCV CV2 with 92.5% classification accuracy

SkinScan — Jan 2022 – Nov 2022
Machine learning for skin-cancer classification

- Achieved 85% classification accuracy for 7 skin-cancer variants via novel Convolutional Neural Network algorithm
- First-authored publication in Harvard University's JEI journal to analyze data and evaluate performance statistics

Skills

Programming: C, C++, C#, Java, Node, SQL, Go, Python, MATLAB, Rust, x86, JSON, XML/YAML, Perl, Shell
Tools: Ansys, Docker, Flask, AWS, MPLAB, Linux, GCC, YouTrack, Jira, SVN, GitLab, Pandas, Grafana, GPS, ADC
Embedded: FreeRTOS, Bare-Metal, Linux, Oscilloscope, Power Analyzer, DMM, Signal Generator/Analyzer, GNSS