

Karim Abou El Kheir

Computer Engineering at Cal Poly SLO

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Education

California Polytechnic State University, San Luis Obispo

2023 – Present

B.S. Computer Engineering | Expected June 2027 | GPA: 3.6

Allan Hancock College

2020 – 2023

GPA: 4.0 | 64 units earned

Relevant Coursework: Microcontrollers, Systems Programming, Signals and Systems, Data Structures, Digital Design, Electrical Circuits, Computer Design and Assembly

Skills

Languages: C, Python, Java, SystemVerilog

Embedded & Hardware: STM32 / ARM Cortex-M, bare-metal firmware, SPI, UART, I2C, DAC/ADC, timers and interrupts, FPGA (RTL design)

Tools: Git, Linux, Jenkins, Docker, CI/CD, Vivado, LTspice, SolidWorks

Lab Equipment: Oscilloscope, logic analyzer, DMM, bench power supply, soldering

Work Experience

Embedded Software Engineer Intern

Summer 2026

Ouster | San Francisco, CA

- Built a Python hardware-in-the-loop test suite that simulates GPS signals over UART to validate lidar I/O timing, internal clock synchronization, and pulse output across all configurable modes.
- Eliminated 20% pulse loss in frequency readings by engineering a pull-up circuit and implementing high-rate sampling with custom Python edge detection.
- Automated deployment to the CI rack using Dockerized Jenkins jobs triggered on merge requests, static network routing, and a custom 3D-printed hardware mount.

Low Voltage Engineer

2025 – Present

Cal Poly Prototype Vehicles Laboratory | San Luis Obispo, CA

- Designed and implemented a low-latency, browser-accessible video feed using a Raspberry Pi, camera module, and Flask server, enabling real-time visual feedback for remote operation.
- Developing a real-time UDP file-transfer and video-streaming system that segments large data into custom-headered packets and reassembles them at the receiver for the vehicle's display.

Co-Founder

2025 – 2026

Hive Parking | San Luis Obispo, CA

- Developed an online marketplace connecting students with local driveway owners, building the listing, booking, and payment flows end to end.
- Conducted market research and established partnerships with Cal Poly transportation services, positioning the platform as an alternative to parking permits.

CAD Team Lead

2019 – 2022

FIRST Robotics, Spartatroniks Team 3512 | Santa Maria, CA

- Led a design team in 3D modeling a competition-ready robot in SolidWorks, ranking in the top 1% of FIRST teams worldwide.
- Oversaw the full design process from initial sketch to final assemblies, ensuring manufacturability and compliance with FIRST guidelines.

Projects

Cigsense (Air Quality Indicator) Arduino, SolidWorks | [Build Video](#)

- Programmed, 3D modeled, and soldered a device measuring AQI, temperature, and humidity, displaying air quality through its cigarette equivalent.

Signal Generator (STM32) Embedded C

- Programmed a bare-metal STM32 function generator producing sine, triangle, sawtooth, and square waves from 100–500 Hz over SPI to an external DAC, with waveform, frequency, and duty cycle set live from a keypad.

Low Supply Indicator & Remote Display Electrical Design

- Designed electrical circuits using LTspice to wirelessly send and amplify an IR signal.

FPGA Board Memory Game Digital Design

- Designed a Simon-style game using HDL programming in Vivado, integrating it on an FPGA board.

Polyphonic Buzzer Music Player Arduino

- Built and programmed a music player driving active buzzers as solo, bass, and rhythm voices, plus a custom charging station.