# Aaron M. Stafford

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## Career Summary

Designer, educator, problem solver, and maker who exemplifies work ethic, the desire to learn and to teach, and problem solve. History of learning and applying new skills to complete new projects and solve problems. Experience both as a team leader, and as a member of a team. Expertise in:

- Languages: C, C++, Python, Matlab
- Software Development Tools: MPLAB X, CMAKE, VSCode, STM32Cube
- Other Software Tools: KiCad, Onshape, Fusion360, LTSPice, Inkscape
- DevBoards/MCUs: STM32L4, RP2040, ATTINY, ESP32, Arduino, Raspberry Pi
- Equipment: Oscilloscope, laser cutter, CNC router, 3D printer, multimeter, soldering iron, MIG welder
- Communication Protocols: I2C, SPI, UART, I2S, BLE, WIFI

## Career Highlights

Designer

- Designed and manufactured instructional equipment on a regular basis (drawbot, data loggers, other mechanical parts)
- Developed, created curriculum for, and wrote level I and level II robotics classes to teach students fundamental engineering skills
- Designed a CNC stool that is used as a woodshop project for hundreds of students across the district

Educator/Learner

- Regularly plan, prepare, and present three separate lessons daily.
- Help students debug and troubleshoot problems with code and hardware.
- Taught over 1000 students fundamental programming skills, CAD skills, soldering
- Regularly look for opportunities to expand skills and try new things. Currently expanding knowledge of analog circuits, and data loggers
- Worked on various content teams, helping to make decisions regarding pacing, discussing best practices

Problem Solver

- Designed equipment to enable students to focus more on learning, while spending less getting equipment to work
- Wrote C++ libraries to simplify programming challenges faced by robotics students
- Designed and manufactured relay box to allow students to safely switch 120V AC using a microcontroller

## Professional Employment History

SELF-EMPLOYED 2017 – Present

*Design, Engineering, Construction*

- Designed products for small batch manufacturing, and sold products online
- Designed equipment and wrote software libraries for use as instructional tools.
- Ran wiring, installed fixtures and switch boxes for new construction house project
- Ran wiring for an installed fans and fan controllers
- Designed and built custom furniture, built-in cabinets, and bookshelves
- Created bookshelves with channels for wiring for under shelf lighting

CHAFFEY JOINT UNION HIGH SCHOOL DISTRICT, Rancho Cucamonga, CA 2011 – Present

*Robotics, Physics, AP Physics, and Algebra teacher at Ontario High School and Rancho Cucamonga High School*

- Nominated for, and selected as “San Bernardino County Teacher of the Year for 2019”
- Wrote curriculum and developed pilot course for level I and level II Arduino based robotics class.
- Designed and manufactured equipment and tools for students to use as they learn C++ coding skills
- Founded Ontario High School’s first engineering club in 2013
- As course lead for physics, participated in meetings and made decisions regarding curriculum and pacing
- Collaborated as member of algebra team developing curriculum, setting calendar, and planning assessments.

YES PREP PUBLIC SCHOOLS, Houston, TX 2009 – 2011

*Algebra Teacher*

- As math teacher, 100% of students earned passing scores on state math assessment
- Planned and implemented innovative model in classroom for maximizing learning of 40 student classes
- Differentiated instruction and tracked progress for 75 students

- Collaborated w/ 7-member team to plan & implement strategies for student success

NAVAIR, China Lake, CA 2008 – 2009

*Physical Scientist*

- Received Security Clearance; secret level
- Used visual basic to develop application for analyzing high speed data in files larger than 150 MB
- Aided test engineers by analyzing high speed video and presenting data in original and helpful ways
- Authored documents and presentations that were later presented to the Naval Safety Board for approval

## Projects

PCB Design:

- Designed and manufactured soldering kits used by hundreds of robotics and physics students
- Designed multi-piece "smart" photogate
- Designed Rocket datalogger to log altitude and accelerometer data during rocket flight
- Created Arduino drawbot shield, for use in controlling stepper motors
- Created Machine learning data logger for students to use in collecting sound or accelerometer data

RP2040:

- Built smart photogate device to time, calculate, and display speed of object passing through gates, modified existing STM32 OLED driver to work for RP2040

STM32L4:

- Designed coffee maker "circuit" using multiple interrupts, displayed time, water level, and status on OLED, triggered relay

Arduino:

- Solar powered parking sensor to aid with parking a large car in a garage.
- Designed and manufactured Arduino controlled drawbot for student use. Created C++ stepper library as a tool for students to use in controlling the drawbots.

ESP32:

- Built a data logger where multiple devices recorded periodic data to the cloud for purposes of students getting 24 hour data from a lab. Used IFTTT and google sheets.
- Built a data logger to record and store wav files or accelerometer data onto an SD card. The purpose was to record large amounts of data so students could create embedded ML devices to recognize keywords or gestures.
- Build a flight data logger for model rockets to record barometric pressure and accelerometer data onto SD card.

Raspberry pi:

- Configured Raspberry Pi to operate as gcode sender and controller for CNC

Lithophane Lamp:

- Designed laser cut and 3d printed walnut framed lamp with four images. Light shines through, displaying images. Wrote python script to aid in the process of converting images to lithophanes. Regularly make and sell lamps through Etsy store.

## Education

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| Embedded Systems Certificate, UC San Diego Extension | San Diego, CA | TBC 2022 |
| *Real Time Embedded Systems, Embedded Hardware Design, Embedded C, RTOS* | | |
| Digital Signal Processing (DSP) certificate, UC San Diego Extension | San Diego, CA | 2022 |
| RF Communications certificate, UC San Diego Extension | | TBC 2023 |
| C/C++ Certificate, UC San Diego Extension | San Diego, CA | 2021 |
| B.S., Physics, B.A., Philosophy, Minor, Mathematics, Azusa Pacific University | Azusa, CA | 2008 |

## Professional/Community Affiliations

- 2019 San Bernardino County Teacher of the Year
- Awarded $15,000 grant by employer to develop affordable, accessible robotics program
- Appointed to District Vision team to assist in planning for new health sciences high school
- Single Subject Teaching Credential – Mathematics, Science: Physics
- CTE Credential – Engineering and Architecture
- Raspberry Pi certified educator
- ACT, CTA member