

JENNIFER HADDAD

Electrical Engineer · Embedded Firmware & PCB Design

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EXPERIENCE

Electrical Engineer, Applied Vision Corporation (Antares Vision Group)

03/2025 - Present

Machine vision inspection systems for glass and container manufacturing. Akron, OH

- Replaced a hardware-controlled PIC32 with an STM32 slave, writing register-level SPI code fast enough to answer the master within the same SCK cycle.
- Designed and wrote the firmware for a daisy-chainable 4-axis stepper motor control board (STM32H5) in a **\$450,000** inspection machine; the master's non-standard I2C meant writing bare-metal I2C with a custom address-arbitration algorithm.
- Fixed a critical SPI daisy-chain fault in an LED driver product by reworking the driver firmware; the fix shipped on the production board.
- Designed a 4-layer power board around a 169-ball BGA FPGA, delivering **40 A total at 24 V across four channels** in a tight footprint; split the power plane into four while keeping the ground plane solid, with 2 oz inner copper on the high-current paths.
- Released **10 production boards** end to end (schematic, layout, BOM, fab package), including a 4-layer STM32H5 high-current controller, a circular LED array, and a multi-protocol control board with RS-485, Ethernet, and I2C on a 24 V rail.
- Collaborated with the software team to integrate the board firmware with the machine's user interface.
- Worked with the mechanical team to check board outlines and mounting holes against the enclosure before release.
- Wrote the stepper system's 40-page documentation in separate operator and engineering editions, plus an errata correcting six constants and two procedures in older internal docs.
- Taught myself DraftSight to take over cable assembly drawings; produced the drawing set and BOMs (Molex Micro-Fit/Mini-Fit, Micro-D) and caught terminal incompatibilities before release.

Electrical Engineering Technologist, GE Healthcare

03/2024 - 03/2025

MRI coil repair and refurbishment. Aurora, OH

- Repaired 1+ MRI coil per day, from fault isolation to functional test, extending coil lifespan 3 to 5 years and saving ~\$5,000 per coil: about **\$130,000 a year** and **20% less** equipment downtime.

SKILLS

Software / Firmware: Embedded C, C++, Python; STM32 HAL and bare-metal register level; UART, SPI, I2C, CAN, RS-485, CRC

Microcontrollers: STM32 (H5, N6, F7, C0), ESP32, PIC32, Arduino, Raspberry Pi

PCB / CAD: OrCAD Capture, Allegro PCB Designer, KiCad 9, DraftSight, LTspice

Lab & Test: New board bring-up and test, oscilloscope, logic analyzer, multimeter, soldering and rework, root cause analysis, formal test reports, BOMs

SELECTED PROJECTS

- **Autonomous UAV quadcopter:** current side project combining the experience gained so far, from board design and embedded firmware to real-time decision-making with machine vision and ML. At version 0, designing the STM32N6 flight-controller board.
- **MEDIBOT (M.Eng. capstone):** 3D-printed patient-monitoring instrument. Raspberry Pi 4 and Arduino capturing SpO₂, heart rate, blood glucose, and non-contact temperature to a database, with facial recognition binding each reading set to the right patient record and a Python front end.

EDUCATION

B.E. and M.Eng., Electrical Engineering, Minor in Biomedical Engineering

09/2018 - 07/2023

American University of Beirut, Beirut, Lebanon. Accelerated five-year combined bachelor's and master's program.

Languages: English (fluent), Arabic (native), French (professional)