# Christopher R. Culpepper

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## EXPERIENCE

*Senior Electrical Engineer* *2019 - 2026*

FTL Labs Corporation, Amherst MA

- Designed, assembled, tested FPGA RFSoC based RADAR system
  - Included Xilinx RFSoC module, X-Band RF LO, downconverter
  - Fully owned electrical hardware, as well as FPGA code
  - Project included a large amount of reverse engineering and RF design
  - Iterated design to meet signal integrity, EMI, shock, vibration testing
  - Managed requirements and test procedure
- Designed and built large li-ion battery for underwater applications, designed with safety in mind
- Developed and implemented battery test plan for pressure, electrical, thermal and capacity
- Designed, implemented acoustic threshold measurement system, with absolute SPL, HW + SW
- Designed LED illumination array for blood clot detection
- Designed interface electronics, analog piezo load cell interface, COTS LED module dimmer
- Reverse engineered commercial laser diode driver to implement temperature-stable driver circuit
- Designed control loop to keep laser diode at constant optical power over temperature

*Senior Electrical Engineer* *2016-2019*

General Dynamics Mission Systems, Pittsfield MA

- Developed and executed evaluation and qualification tests for inherited hardware
- Performed software and systems testing on high-integrity mission-critical software
- Managed requirements and test cases for a variety of applications and hardware
- Performed integration and repair operations on legacy hardware

*Test Engineer Co-op* *2016*

Space Exploration Technologies, Hawthorne CA

- Designed and built hardware to test bias-T HD cameras
- Created software to automate the creation of trouble reports
- Troubleshot issues with avionics test racks

## EDUCATION

*Bachelor of Science,* Computer Engineering

Rochester Institute of Technology, Rochester NY, Graduated May 2017

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|---|---|
| Digital Signal Processing | Cyborg Theory |
| Data Communication and Networks | HW & SW Design for Crypto Applications |

## PERSONAL PROJECTS

*24 Hours of Lemons Racecar*

- Procured $500 car, built it into an endurance racecar
- Designed and built roll cage, selected performance components

*FPGA SDR RF Exploration (in progress)*

- Building FPGA SDR exploration system to learn RF, VHDL, DSP, FPGA networking
- Created custom VHDL drivers for frequency generation, ADC, I2S

*Home Networking (Homelab)*

- Focus on internal and external services running on VMs, Linux, FreeBSD
- DIY'ed comms wiring, on and off-site backup, storage
- VLAN seperation, hardware PCI passthrough, PoE

*Yaesu VX-8 Battery*

- Designed a PCB that features USB-C charging, balancing and temperature monitoring
- Designed a 3D printed case featuring compliant clips, light pipes and a tight internal layout

Various Other Projects:

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| Soviet 120mm$^2$ RGBW VFD driver | Racecar Rollcage and Endurance Prep |
| Motorcycle Speedometer | Race Car Data logger and Comms Board |

## SKILLS & AWARDS

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|---|---|
| Eagle Scout | Networking, subnetting, servers |
| First Aid/AED/CPR, WFA, Stop the Bleed | |

Languages & Software:

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|---|---|
| C | OpenSCAD and FreeCAD CAD Software |
| Kicad PCB Design Software | Wireshark |
| Python | Microsoft Office |
| Linux/UNIX (Arch, Debian, BSDs) | AutoIt Automation Scripting |
| VHDL | Networking Equipment Configuration |

## PERSONAL INTERESTS AND HOBBIES

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|---|---|
| Amateur Radio Extra | 3D Printering |
| Motorcycle and automobile repair | Photography (Analog, digital) |
| Camping, hiking, and dancing | Carbon fiber layup |
| Community Building | Licked thing that was in space |