

Leo Norton

(303) 550-1903 | Norton.le@northeastern.edu | Nortware.com

Education

Northeastern University – Boston, Massachusetts

May 2023 – Present

Candidate for Bachelor of Science in Electrical Engineering

GPA: 3.72 / 4.00

Coursework: Circuits and Signals, Embedded Design, Differential Equations and Linear Algebra, Calculus 3

Activities: Wireless Club facilities manager, Northeastern IEEE and Wireless Club Workshop leader, Game Development team leader, Amateur radio medical team communications for the Boston Marathon, Unicycle Club president, Bluegrass Club treasurer

Fairview High School – Boulder, Colorado

Graduated 2023

Activities: Leader of Game Development Club, SAT tutoring

GPA: 4.48 / 5.00

Awards: Cum Laude, Award for most creative AR interaction in NIST CHARIoT Challenge

Experience

National Renewable Energy Lab, Center for Integrated Mobility Sciences, Boulder, CO Summer 2024 Independently programmed features for the vehicle charging station modeling tool EVI-EnSite. My features included animation generation for data analysis and modeling the charging and usage of hydrogen infrastructure for fuel cell vehicles. Data analysis tools were programmed using Geopandas and optimized with Dask.

National Institute of Standards and Technology (NIST) Communications Technologies Lab, Boulder, CO Summer 2023 Built op-amp/VCO driver for Pound-Drever-Hall(PDH) laser locking to 4°K optical cavity used in optical to microwave quantum transduction experiment. Successfully locked using the Red Pitaya field programmable gate array(FPGA) as a proportional integral derivative controller. Independently aligned and PDH locked to a different, room temperature optical cavity. Built circuits using op-amps, mixers, and various filters for a microwave receiver. Helped in operating cooling cycles and leak-checking dilution refrigerator.

NIST Physical Measurement Lab, Boulder, CO Summer 2022 Worked on quantum entanglement optics - Built and programmed remote voltage control system for a high-speed photon polarization switch. Created a web interface and server to control a Pi-based driver. Designed and built custom digital-analog converter printed circuit board (PCB).

Reality Garage, Boulder, CO Summer 2020 and 2019 Programming at virtual reality start-up company - Developed a virtual reality moon landing simulation in C# and Unity, for display at a museum. Worked in a three-person team, on an augmented reality information display to be used by wildfire firefighters for the NIST CHARIoT Challenge.

NortWare LLC, Founded NortWare LLC in 2022, a company that creates and markets video games. Solo programmed a 3D adventure game in C# published on the Steam platform (over 100 sales in the first few weeks).

Skills

Electronics: Proficient in circuit simulation and prototyping, printed circuit board design and assembly, Arduino and Raspberry Pi development, PCB milling, Certified amateur radio technician

Software: Python, C++ (FPGA development), C#, MATLAB, Java, HTML, CSS, GitHub, AutoCAD, SolidWorks, Fusion 360, Adobe Suite, Unity

Lab: Optical table setup and alignment, PDH locking to optical cavities, basic dilution refrigerator operation, soldering, laser cutting, 3D printing, CNC milling

Engineering Projects

Tesla Coils, Personal Project (see on website)

2024 - Present

- Designed and built high frequency power mosfet circuits to drive homemade coils
- Produced ~600kV, lit a compact fluorescent from four feet away with no direct electrical connection

Electrocardiograph, Circuits and Signals

Fall 2024

- Designed, simulated, and built instrumentation amplifier and filter circuits to measure a heart signal
- Sampled the signal using an A/D converter and performed digital filtering in MATLAB

Robotic FPGA Spider, Embedded Design

Fall 2024

- Programmed DE10-Nano FPGA using C++ to control 18 servos in the legs of a hexapod spider to perform movements such as walking, turning, and standing up

Build a Wind Turbine Museum Exhibit, Cornerstone of Engineering (see on website)

Spring 2023

- Worked almost independently to design and build an interactive museum exhibit for elementary students
- Modular turbine testing machine with analog circuit performance measurement and Unity integration