

Donald Mackinnon

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Education

Northeastern University, Boston, MA

May 2027

Bachelor of Science in Electrical and Computer Engineering, GPA 3.37

Courses: Embedded Design: Enabling Robotics / Circuits and Signals / Discrete Structures / Fundamentals of Networks / Calculus 3 / Physics 2 / Computing Fundamentals / Differential Equations and Linear Algebra

Activities: Robotics Club, Forge, Wireless Club, Roxbury Robotics, Northeastern BAJA SAE

Technical Skills

Electronics: Intel Quartus, Arduino, soldering, digital multimeter, function generators

Programming: C++, Python, MATLAB, Verilog

Software: Altium, SOLIDWORKS, Windows OS, Linux, Microsoft Office, Bluebeam, AutoCAD, Revit

Engineering Projects

Northeastern University, Boston, MA

MATE ROV

September 2023 - Present

- Maintained and modified the primary power and data cables of the ROV for the 2023 MATE competition
- Created and tracked the power budget for the 2023 ROV's electrical system
- Waterproof soldered various connections and tested various thrusters

Northeastern BAJA SAE

September 2024 - Present

- Designed and assembled new timing gate circuit to measure any car's acceleration for competition
- Tracked total cost of all parts and labor for 2025 competition car and wrote a cost report to submit for competition
- Machined various metal bearings and shafts using a manual lathe

Back Buddy

January 2025 – May 2025

- Designed and assembled the electrical system for the portable back support device *Back Buddy* with Arduino and control circuitry
- Presented and explained Back Buddy's functionality and electrical system at Forge's Spring 2025 Showcase

Electrocardiogram (ECG)

December 2024

- Created a functioning ECG circuit to measure heart rate using op-amps with low and high pass filters
- Digitally recorded the ECG's readings in MATLAB and further filtered them using MATLAB's digital filter functions

Robotic Arm

July 2024

- Enabled a robotic arm to move and grasp various items by programming stepper motors using circuit design in Intel Quartus
- Recreated the functionality of the circuit design in a C++ program using bit masking and UNIX

Work Experience

Boston City Hall, Boston MA

January 2025 - Present

Jr. Traffic Engineer

- Programmed and adjusted the timing of various traffic lights across the city of Boston daily
- Prepared traffic engineering plans for future developments of major intersections using AutoCAD and Bluebeam
- Monitored 400+ traffic cameras and 900+ traffic lights in Boston and coordinated with BTD's signal shop to maintain them

McConnell-Talbert Stadium, Warner Robins GA

November 2022, 2023

Cashier

- Performed quick mental calculations due to absence of a calculator and a proper cash register
- Served also as a food handler and ticket taker due to a staff shortage

Activities and Interests

Roxbury Robotics

- Taught introductory robotics to children through hands-on activities and LEGO Spike in Fall 2023
- Oversaw a competition where over 100 children competed with their constructed LEGO robots against each other