Patrick MacKay | Halifax, NS | 902.218.6555 | Patrick.MacKay@icloud.com

PROFESSIONAL SUMMARY

I am an Electrical Engineer-in-Training with hands-on experience in system design, automation, and renewable energy integration. I've designed and installed off-grid solar power systems, including centralized breaker panels and multi-building distribution networks. I'm proficient in C++, Python, energy management systems, and software development, with a strong ability to automate complex processes and design scalable solutions. Seeking full-time or contract opportunities in Halifax.

EDUCATION

- **Bachelor's degree in Electrical Engineering |** *Dalhousie University – Sept 2018 - Dec 2023*
- **Grade 12 – Honours |** *Charlottetown Rural High School – Graduated June 2017*
- **DELF Niveau B |** *Bilingual certification for French - 2017*

TECHNICAL SKILLS

- **Programming Languages:** Python, C, C++, MATLAB, VBA, HTML, CSS.
- **Tools & Platforms:** Git, Visual Studio, Excel Macros, MATLAB Simulink, ROS, PCB Design.
- **Specialized Knowledge:** Excel automation, mathematical modeling, and simulation.
- **Hard Skills:** Extensive construction experience, including electrical and fine carpentry.

RELEVANT EXPERIENCE

Electrical Consultant | The Baja Station
Dec 2024 – Feb 2025 (Volunteer)

- Designed and implemented a **solar based off grid electrical system**, wiring together a community compound including a music studio, cafe, kitchen, carpentry workshop, and performance centre.
- Calculated voltage loads, sourced materials, built distribution panel, installed wiring.

Engineer in Training | Halifax Regional Centre for Education
Sept – Dec 2022 (Co-op)

- Developed an **automated budgeting program** using **VBA** and **Excel Macros**, reducing manual workload by 30%.
- Designed **solar energy systems** using **MATLAB Simulink** for multiple educational facilities, optimizing configurations for energy efficiency.
- Produced comprehensive **energy reports**, helping schools progress toward net-zero energy consumption.

Engineer in Training | Michelin
Jan – May 2022 (Co-op)

- Created an **auto-stop safety system** for a robotic wind-up process using **C++** and **electrical circuit design**, improving compliance with safety standards.
- Analyzed **conveyor belt motor systems**, providing recommendations to standardize based on system specifications.

RELEVANT PROJECTS

Solar- based off grid electrical system

The Baja Station (2025)

- Designed and installed a solar network that wired together solar panels, battery management system, inverter, bar/cafe, stage, media studio, kitchen, and carpentry workshop.
- Calculated voltage loads, sourced materials, built distribution panel, wired together community compound.

Sand Battery

Independent Contract (2023)

- Designed and built an Arduino- based battery management system to regulate heat energy stored in a large tub of sand, inspired by the Dutch *Polar Night Energy* design.

CAN BUS

Dalhousie University, Senior Year Project (2023)

- Created a CAN System for Dalhousie's Formula E race car. This connected the accelerator, brakes, "gear shift", dashboard, BMS, and acted as the "brain" of the vehicle. This was done with Raspberry PIs, Arduinos (and Arduino code), Python, and C++.

Python based Robot

Dalhousie University (2023)

- Used python to build a robot that received visual cues through a webcam and navigated a series of courses, using dead reckoning and other course planning algorithms.

Mine Detection Robot

Dalhousie University (2022)

- Used C++, Python, ROS to program an autonomous robot that used LiDAR and sonar to navigate a real-world maze, locate motion sensitive mines, and then disarmed them with a specific electromagnetic frequency, before removing and storing them in a dedicated zone, while avoiding moving obstacles.

Automated Budgeting Program

Halifax Regional Centre for Education (2022)

- Developed a program to automate budgeting for energy management contracts using **VBA** and advanced Excel features.
- Reduced manual workload by 30% and improved accuracy in financial tracking.

Solar Array Design

Halifax Regional Centre for Education (2022)

- Designed multiple solar energy systems using **MATLAB Simulink** and **CAD software**.
- Optimized system configurations to achieve energy efficiency goals for educational facilities.

Auto-Stop Safety System

Michelin (2022)

- Created an automated safety system for a robotic wind-up process, involving **C++ programming** and electrical circuit design.
- Enhanced safety and compliance with industry standards.

ADDITIONAL EXPERIENCE

Tree Planter, Brusher | Blue Collar Silviculture *May 2024- October 2025 (Seasonal)*

- Best performing rookie with a personal best of 7,050 trees planted in one regulation length day on B.C. wildfire rehabilitation land.
- Camp record of 10,000 trees in one regulation length day on B.C. wildfire rehabilitation land.

Bartender, Server | Morris East *July 2023 – Jan 2024 (part time)*

Scaffolder | Sky Rise Construction *July – Nov 2023, Mar 2024 (Casual)*

Solar Installer | Boomerang Energy *May – August 2023*

General Labourer | Grafton Connor Group *Summer 2020, Summer 2021*

Elections Officer | Dalhousie Undergraduate Engineering Society *Jan – Apr 2021*

- Planned and executed info sessions, campaign meetings, and organized student body elections for the engineering society.
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Groundskeeper, The Deanery Project *August 2021 – January 2022*

- Stayed on site for 2 weeks, working part-time and volunteering part-time. Assisted in building a sound studio, creating an art installation, working in permaculture gardens, clearing trails, and winterizing the facility.

EXTRACURRICULAR ACTIVITIES

I have been travelling the world since January 2024, exploring diverse regions including Hawaii, Japan, Thailand, Sri Lanka, India, Turkey, Northern BC, Vancouver Island, the west coast of the United States, Mexico, and Guatemala. Recently, I completed a motorcycle journey from northern BC to the southernmost tip of the Baja peninsula, and back. Currently, I am working as a tree planter based in Quesnel, British Columbia. When I am stationary, I split my free time between writing and performing folk music, and surfing.