

Bruno Nawfal

(514) 246-5388

bruno.nawfal@hotmail.com

Summary

- Electrical engineering graduate specializing in automation, with hands-on experience in embedded systems, robotics, FPGA/VHDL design, and hardware-software integration
- Strong academic background in ARM architecture, low-level programming, object-oriented programming, and software development
- Proficient in Assembly, C, C++, Python, VHDL, Linux, Git, and Docker
- Project experience in FPGA-based designs, closed-loop control, machine learning, and IoT communications using MQTT, HTTP, and REST APIs
- Fluent in French and English; rigorous, analytical, and experienced in multidisciplinary industrial environments

Education

Bachelor's degree in Electrical Engineering

2021-2026

Polytechnique Montréal

Technical skills

- Design: Rhinoceros3D, AutoCAD
- Microsoft Office: Access, Excel, Visio, Teams, PowerPoint, Word, Power BI
- Programming language: ASM, C, C++, Python, Matlab (Simulink), SQL, VBA
- Digital Design: VHDL, Xilinx Vivado
- PLC programming: Grafset/SFC, Ladder, Structured Text
- Tools: Visual Studio Code, Linux Command Line Interface (CLI), Docker, Git

Professional Experience

Electrical Engineering Intern

May 2025 - August 2025

Asis Boats - Dubai, United Arab Emirates

- Contributed to production-line automation initiatives
- Designed custom accessories using Rhinoceros3D and AutoCAD
- Automated work order generation by developing a custom SQL/MySQL database and Python scripts, simplifying the creation of general and department-specific tasks

Teaching Assistant – Digital Logic Design

January 2025 - May 2025

Polytechnique Montréal - Montreal, Canada

- Supported the development and debugging of FPGA-based digital designs in VHDL
- Analyzed logic, synchronization, and simulation errors in laboratory exercises and projects
- Assisted students in creating testbenches to validate circuit behaviour
- Explained complex technical concepts and solutions in French and English

Electrical Engineering Intern

May 2024 - August 2024

Solico - Dubai, United Arab Emirates

- Programmed and configured of CNC machines for robotic milling and welding operations
- Carried out tests, adjustments and validations in production, in collaboration with the workshop
- Developed a VBA-based Excel application to automate the quotation process

Projects

AI-powered autonomous irrigation system

2024

The development of an automatic plant watering robot using a deep learning model to identify plant species and determine their specific needs.

- Designed the robot's movement and watering control systems
- Implemented closed-loop servo control to maintain a straight-line trajectory
- Developed a plant-species classification model in Python using TensorFlow/Keras
- Containerized and deployed the deep learning model using Docker
- Implemented a client-server architecture enabling communication between the irrigation robot and the model-hosting server over HTTP

Real-time spectrum analyzer on FPGA

2025-2026

Designed a resource-optimized real-time spectrum analyzer on an FPGA.

- Designed an FPGA processing pipeline to convert I/Q samples into a power spectrum using windowing and FFT processing
- Implemented a fixed-point FFT core optimized for digital signal processing
- Created Vivado testbenches and simulations to verify the correctness of the signal-processing pipeline

PLC-based industrial hoist automation

2025

Design and implementation of an automated parts handling system using industrial PLCs and real-time monitoring

- Implemented sequential control logic using GRAFCET/SFC and Ladder Logic on a Schneider Electric Modicon M340 PLC
- Developed a multi-screen Magelis HMI for real-time position monitoring, operating-mode management, and diagnostic messaging

Smart charging controller for electric vehicle fleet

2025-2026

Development of an EV fleet simulator to generate repeatable scenarios for training and validation. Use of a TFT-based forecasting model as well as a MILP optimizer to plan charging and reduce costs.

- Implemented a modular communication stack using MQTT (Mosquitto) and REST APIs
- Developed a machine learning forecasting approach combining behavioral clustering by GMM and Temporal Fusion Transformer (TFT) models under PyTorch to predict departure times and required charging energy from historical sessions
- Formulated a cost-minimizing charging strategy as a mixed-integer linear programming problem using Pyomo/HiGHS, producing per-vehicle charging windows under building-power and availability constraints

Languages

French: Level C2 (fluent)

English: Level C2 (fluent)