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SKILLS SUMMARY

- **Embedded & Control Systems:** Experience developing **firmware** for **TM4C, Arduino, ESP32** and programming **ControlLogix PLCs**.
- **Programming:** Proficient **C/C++, Python, MATLAB, and Ladder Logic(Studio 5000).**
- **Circuit Design & Prototyping:** Skilled in **circuit design, analysis, and testing** using Multisim, Ultiboard, oscilloscopes and multimeters.
- **CAD & Simulation:** Proficient in **SolidWorks, AutoCAD Electrical, Automation Studio, Simulink, and LVDAC-EMS**.
- **Languages:** Fluent in **French & Spanish**
- **Other:** Class **G driver's license**.

PROJECTS

Autonomous Box Cartoning Machine September 2023 - April 2024

Led a team of 3 students to **design and implement** a fully functional automated box cartoning system which was **showcased at the Humber Capstone Expo.**

- **Modelled** preliminary design in **Solidworks**.
- Designed and implemented a **pneumatic circuit** to control **pneumatic actuators** using solenoid and flow control valves.
- Developed **embedded C firmware** to manage sensor input, solenoid switching, and DC servo motor control.
- Implemented a relay interface between high-voltage solenoids and low-voltage TM4C microcontroller, ensuring safe operation and hardware protection during system operation.

DC Motor PWM Control Board December 2023

- Assembled a PWM-based DC motor controller using a 555 timer circuit **simulated in Multisim**, enabling adjustable speed control for low-voltage DC motors.
- Followed schematic instructions to lay out the PCB in **Ultiboard**, ensuring proper component placement and trace routing.
- **Soldered** over 20 through-hole components onto the PCB using standard **safety procedures**, ensuring connection reliability and integrity.
- Verified circuit functionality by analyzing PWM output waveforms (frequency, duty cycle) with an **oscilloscope** and ensuring electrical continuity with a **multimeter**.

AWARDS & INTERESTS

- Won an **award at UTM Appathon (2019)** for developing the best mobile app.
- Recipient of **Computer Engineering Technology Award** (2021) for demonstrating a **commitment to learning** and **passion** for the discipline**.**
- **French Immersion Certificate** (2021).
- Passionate about computer hardware, including building custom PCs and experimenting with embedded systems through hobby projects.

EDUCATION

Bachelor of Engineering - Mechatronics | Year 3 *April 2027 (Expected)*
Humber Polytechnic, Etobicoke, ON

- Consistently achieve Dean's Honour List.

Relevant Coursework:

- **PLCs:** Programmed **ControlLogix PLC**s, and **PanelView HMI**s in **Studio 5000** and **FactoryTalk**, wired field devices including stepper motors, indicator lights, pneumatic cylinders, RTD and proximity sensors, and created wiring diagrams in **AutoCAD Electrical**.
- **Control Systems:** Designed and simulated a longitudinal helicopter controller in **MATLAB/Simulink** and surpassed desired performance criteria. Applied **PID**, lead-lag, and pole-placement methods with consideration for robustness and real-world control constraints.
- **Microcontrollers:** Developed **embedded C firmware** on a TM4C microcontroller for an autonomous cartoning machine including sensor and actuator control.
- **Instrumentation and Measurement:** Wired and **calibrated various sensors** including RTD, differential pressure transmitters, and rotary encoders, and processed analog signals using LabVolt data acquisition software.
- **Robotics:** Programmed **KUKA KR4 R700** for applications including pick-and-place operations with sensor confirmation, emulating real world scenarios.
- **Signal Processing:** Developed a lightweight MATLAB API to streamline analysis of EEG datasets, featuring reusable classes for modular filtering, FFT analysis, visualization, and feature extraction across channels and subjects.
- **Autonomous Vehicles:** Developed and tested algorithms for PID-based speed control, Stanley lateral control, LiDAR-based occupancy grid mapping, extended Kalman filter state estimation, and lane detection. Implemented ROS2 publisher-subscriber nodes in C++ for simulated vehicle telemetry and control.