Juan Pablo Becerra-Padilla
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Technical Skills

- **Embedded Systems:** Bare metal development, Serial Communication Protocols, exposure to FPGA/VHDL development, Linux.
- **Programming:** Embedded C/C++, Python, MATLAB, assembly, **Git**.
- **Circuit Design & Troubleshooting:** Proficient in reading electrical schematics & datasheets, PCB layout, oscilloscope, logic analyzer, digital multimeter, signal generator.
- **Languages:** Fluent in French and Spanish.

Education

Bachelor of Engineering – Mechatronics Engineering April 2027(Expected)
Humber Polytechnic, Etobicoke, ON

- Dean's Honour List (all years)

Projects

I2C/SPI-to-UART Bridge Driver (SC16IS740) June 2025

- Developed a **modular, reusable driver** for the NXP SC16IS740 I2C/SPI-to-UART bridge with portable interface design.
- Implemented **UART** configuration (baud rate, parity, stop bits, word length), loopback test mode, 64-byte burst Tx/Rx, and **error/status tracking**.
- Abstracted low-level I2C/SPI operations, enhancing **code debuggability and maintainability** for complex embedded systems.
- Validated driver functionality using **loopback** and **integration tests**, which were verified using **Saleae logic analyzer** software and STMCubeIDE's debugging tools.

Autonomous Box Cartoning Machine Sept 2023 – Apr 2024

- Led a team of 3 to deliver a fully automated box cartoning system prototype, writing **firmware in C** to manage control logic and sensor integration.
- Implemented a pneumatic actuation system using solenoids, vacuum generators, and pneumatic cylinders.
- Performed integration tests and assembly of pneumatic, electrical, mechanical, and firmware subsystems, ensuring reliable and safe system operation.

DC Motor PWM Control Board Dec 2023

- Built a PWM-based DC motor controller using a 555 timer circuit, enabling variable speed control for low-voltage motors.
- Laid out and routed PCB in Ultiboard, soldered and assembled over 20 components.
- Validated functionality through **oscilloscope waveform analysis** (frequency, duty cycle verification) and **multimeter** continuity testing.