Carlos Narvaez

Embedded Systems Developer / Engineer

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PROFESSIONAL SUMMARY

Embedded instrumentation systems integrator with 10+ years of experience in electronics and software design, executing all embedded development stages: system conception, firmware design, programming and testing, hardware prototyping, and final PCB design and validation. Experienced in bioelectronics project development, general instrumentation design, and testing.

SKILLS

Firmware & Software: Embedded C, C++, Python, ASM, RTOS, Embedded Linux, Multithreading, Git, Debugging

Platforms: STM32, ESP32, ATMega, Microchip PIC, Raspberry Pi, BeagleBone Black, NVIDIA Jetson, Arduino

Hardware: KiCad, Altium Designer, PCB layout, SMD soldering, analog circuit design (AD620, INA114, MAX4194/4094), mixed-signal systems, BOM management, wire harnesses

Protocols & Lab: I2C, SPI, UART/Serial, CAN, One-Wire, MQTT; oscilloscopes, logic analyzers, digital multimeters

Soft skills: Problem solving, time management, teamwork, creativity, adaptability

PROFESSIONAL EXPERIENCE

Embedded Systems Engineer
Oct 2025 – Present

Morphace (Self-Employed Contractor) · Greater Toronto Area

- Designed embedded circuits and PCBs in KiCad for skin-health and bioelectronics applications.
- Supported hardware validation and regulatory compliance under CSA SPE-3000:19.

Embedded Systems Developer
Sep 2025 – Present

Moon Trades (Self-Employed Contractor) · Toronto

- Leading sensor integration and embedded system architecture for the PEBBLE™ autonomous exploration platform.
- Selecting and integrating advanced instrumentation, including LiDAR, hyperspectral imaging, and XRF geochemical analysis systems.
- Developing a real-time processing architecture on NVIDIA Jetson Orin for GPS-denied navigation and edge AI; executing hardware integration for OCI Discovery Project underground validation.

Embedded Systems Engineer
Aug 2025 – Present

Robbie Insurtech (Self-Employed Contractor) · Mississauga, ON

- Evaluate and document new hardware sensor upgrades; support software and hardware integration of hard-tech solutions.
- Validated hardware integration using Linux-based tools; field-tested moisture sensors for performance and reliability.

Founder & Principal Engineer
Mar 2024 – Present

Rabbit Systems Inc. · Greater Toronto & Hamilton Area

- Designed a Command Line Interface library for STM32 and ESP32 microcontrollers.
- Designed a Collision Avoidance System prototype for racing cars using a Texas Instruments mmWave radar and NVIDIA Jetson.
- Designed and tested a low-power datalogger system for general-purpose applications.
- Execute requirements from verbal description to functional plan documentation, component selection, and layout and programming of functional PCBs using surface-mount soldering.

Instrumentation & Embedded Systems Developer
Nov 2020 – Mar 2024

Minard (Electronic Components Supplier) · Toronto

- Built firmware to simulate a TRIAXYS wave sensor for remote datalogger testing.
- Created a software architecture for a general-purpose microcontroller command line interface binding serial ASCII commands to MCU functions.
- Conducted system architecture planning, schematic design, PCB layout, and firmware development; integrated an OEM photoplethysmography sensor with a Java GUI.
- Prototyped a 3D-printed harmonic drive for low-cost robotics using a brushless motor.
- Developed a data logger prototype for maritime deep-sensing of seawater conductivity.
- Designed a wireless low-power electrocardiography acquisition device for laboratory rats.

Electronic Instrumentation Engineer
Feb 2018 – Oct 2020

National Autonomous University of Mexico (UNAM)

- Led and collaborated with mechanical and engineering teams developing instrumentation for astronomical observations.
- Maintained the robotic telescopes COATLI and DDOTI, their joint electronic systems, and main computers.
- Designed a CCD testing device using ATMega328 and laser LEDs; produced technical reports.
- Designed a meteorological measurement system for telescope domes using a digital anemometer and BeagleBone Black.

Electrical & Electronic Engineering Professor
Jan 2017 – Jan 2018

National Technology Institute of Mexico (TecNM)

- Facilitated courses in Advanced Programming, Instrumentation, and Real-Time Programming; tutored students on embedded systems.

EDUCATION & CERTIFICATES

Computer Programmer Diploma, Seneca Polytechnic — 2023

Master's in Electronic Engineering (Bioelectronics), Autonomous University of San Luis Potosi — 2016

BEng, Mechatronics Engineering, Technological Institute of San Luis Potosi — 2013

Advanced Multilayer PCB Design with Altium Designer · Basic PCB Design with Altium · STM32 HAL API Driver Development

LANGUAGES & INTERESTS

Languages: English (professional working) · Spanish (native)
Interests: Clay sculpting · Urban cycling · Homemade electronic projects · Hiking · Exploring the city