

Jeevan Sanchez

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EDUCATION

Queen's University

Bachelor of Applied Science in Computer Engineering

- Direct Entry Computer Engineering

Exp. May 2029

Kingston, ON

EXPERIENCE

Queen's Rocket Engineering Team

Propulsion Integration Systems Designer

Avionics Lead (since September 2026)

September 2025 - Present

Kingston, ON

- **Co-leading** the avionics subteam, coordinating **hardware and firmware development** for propulsion control, sensing, and communications systems.
- **Designed two low-EMI 4-layer avionics PCBs** integrating **analog signal conditioning, solenoid actuation, power management, and STM32/ESP32 interfaces**.
- **Developed embedded C/C++ firmware and hardware drivers** for ADCs, Hall-effect sensors, and real-time actuator control over **analog, SPI, I²C, and CAN/TWAI** interfaces.
- **Supported PCB bring-up and system integration**, troubleshooting **hardware, firmware, and interface issues** through functional testing and iterative debugging with the team.

Queen's Engineering Society IT-OPS Team

IT-Operations Team Member

September 2025 - May 2026

Kingston, ON

- **Provide first-level technical support** within a small team maintaining Engineering Society production systems, troubleshooting **hardware/software issues** and managing **support tickets**.
- **Researched an ML-powered RAG pipeline** using **LangChain and OpenAI** to automate IT support workflows and improve **knowledge retrieval and ticket resolution**.

PROJECTS

Penguin

Intelligent Robotics | ESP32-S3, C++, Arduino, PlatformIO, KiCad, OpenCV, Next.js)

May 2026 - Present

Toronto, ON

- Built a **hybrid wheel-legged rover** from the ground up, designing the custom controller PCB, mechanical system, embedded software, and overall system architecture.
- Designed and assembled a **4-layer ESP32-S3 controller**, integrating motor control, power management, **IMU, ToF sensors, OV2640 camera interface**, GPIO expansion, and protected external interfaces.
- Developed **C++ firmware** in **PlatformIO** with hardware drivers, state/command structures, **PID-based locomotion**, behaviour routines, and scheduled sensing and control.
- Built the networking, telemetry, and autonomy systems, combining **HTTP/WebSockets, Next.js/Three.js**, and an **OV2640-based computer vision pipeline** for perception and autonomous navigation.

HomeCtrl

Smart Home-Automation Controller | (ESP32, KiCad, WebSocket, Arduino C/C++, Next.js)

August 2025 - July 2026

Toronto, ON

- **Built a practical home automation system from the ground up**, designing a **4-layer ESP32-S3 controller** integrating **power management**, pump and stepper actuation, analog sensing, I²C peripherals, and protected external interfaces.
- **Developed C++ firmware in PlatformIO** using hardware drivers, **state machines**, and structured control logic for real-time actuator control and sensor acquisition, with **Wi-Fi/WebSocket integration** to a Next.js dashboard and Alexa voice control.
- **Designed a dedicated I²C light-sensor breakout board** with **low-noise routing** and **power integrity** considerations.
- Designed and validated the complete hardware, firmware, software, and mechanical system through **iterative prototyping**.

PID-CV Control System

Dynamic Mass Stabilization System | (OpenCV, PID Control, Python, Arduino C/C++)

August 2025 - October 2025

Toronto, ON

- **Engineered a vision-based control system** using **OpenCV**, dual-axis **PID control**, and servo actuation to stabilize a mass on a tilting platform.
- **Developed a low-latency Python pipeline** for **object detection** and **centroid tracking**, converting visual position errors into independent servo corrections.
- **Integrated custom electronics and 3D-printed mechanics** into a functional prototype through iterative testing, calibration, and **closed-loop PID tuning**.

CERTIFICATIONS

Microsoft Azure AI Fundamentals

Microsoft | Azure, AI/ML | AI-900

August 2025

Toronto, ON

CS50's Introduction to Artificial Intelligence with Python

Harvard University | AI/ML Theory, Python, sklearn | CS50AI

July 2025

Toronto, ON

CS50's Introduction to Computer Science

Harvard University | C Programming, Python, JavaScript, SQL | CS50

July 2024

Toronto, ON

AWARDS

First Place at UofT UTRA Hacks Hackathon

Health System with Integrated Robotics and Firmware | (Arduino C/C++, Next.js, AI/ML)
University of Toronto

February 2025

Toronto, ON

First Place at UofT SEEK JR. Hackathon

Autonomous Martian Rover | (Arduino C/C++)
University of Toronto

February 2024

Toronto, ON