

Jaspartap Goomer

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OBJECTIVE

Embedded firmware engineer skilled in C/C++, microcontroller programming, hardware communication protocols, and low-level debugging. Seeking a role focused on developing efficient, reliable firmware for real-time and hardware-integrated systems.

EDUCATION

University of Ontario Institute of Technology (Ontario Tech University)

Oshawa, Ontario

BSc, Computer Science

September 2022 – May 2027 (expected)

SKILLS

Programming & Development: Java, Python, C++, C, HTML, CSS, JavaScript, RTOS, Glassfish Server

Data & Mathematical Computing: NumPy, pandas, Matplotlib, Logic Analyzer.

Embedded Systems: STM32, ESP32, Raspberry Pi, Arduino, Linux, CANDB++, BUS Master.

Software: Eclipse, MATLAB, Simulink, VS Code, GitHub, IntelliJ, Arduino IDE, Cube IDE, CubeMX, Microsoft Office.

WORK EXPERIENCE

Ontario Tech University ACE (Automotive center of excellence)

Oshawa, ON

Engineering Student

May 2025 – Present

- Designed a diagnostic controller to validate temperature/humidity against time-based thresholds using Modbus TCP/IP and MQTT.
- Developed a Python + Flask API with retry logic and a real-time web dashboard (HTML/CSS/JS) for monitoring, configuration, and control.
- Integrated fault-detection logic with automated SMS/email alerting for critical conditions.
- Prepared detailed software validation test plans covering threshold logic, communication paths, alert triggers, and system reliability.

Ontario Tech Racing (Formula SAE Team)

Oshawa, ON

Embedded Systems Lead

Sept 2024 – Present

- Lead a 6-member embedded team; define coding/documentation standards, development workflows, and train/onboard new firmware contributors.
- Develop ECU firmware in Simulink (Stateflow + Embedded Coder), implementing CAN-based throttle/brake mapping, custom DBCs, and shutdown-circuit/safety-state logic.
- Implement BMS firmware in C/C++ for Analog Devices LTC6813-1: isoSPI communication, cell/temperature acquisition, PEC/open-wire diagnostics, OV/UV/OT/UT fault handling, and passive cell-balancing control.
- Validate ECU and AMS software for HV safety, enabling deterministic monitoring of cell voltages, pack current, thermistors, and automated fault-triggered shutdown sequences.
- Build on-car (ESP32 + HMI) and cloud (Firebase + TypeScript) telemetry stacks delivering real-time battery, performance, and GPS data with integrated fault detection.
- Collaborate with Vehicle Dynamics and HV Systems on telemetry/BMS integration and represent Embedded Systems during FSAE Michigan technical inspections.

Aerecon Drone Design Team

Oshawa, ON

Software Lead

Nov 2024 – Present

- Implemented PID-based flight stabilization for brushless motors using PWM-driven ESCs, with orientation feedback from an IMU transmitted via wireless link.
- Developed Python visualization tools for real-time orientation/acceleration data and integrated GPS for NMEA-based position tracking.
- Engineered a computer vision pipeline on Raspberry Pi using TensorFlow + YOLO for object/face detection from onboard camera streams.

Ontario Tech Space and Rocketry

Oshawa, ON

Software Engineer

Nov 2024 – June 2025

- Developed embedded firmware on STM32 microcontroller for real-time rocket tracking, integrating an IMU for orientation, a barometer for altitude, and flash memory for high-rate data logging.
- Engineered a camera mount with dual-servo actuation and computer vision, enabling automated tracking to keep rockets centered in frame during launch.

PROJECTS

Reflow Oven ([link](#))

Sep 2024 – Oct 2024

- Developed a Human-Machine Interface (HMI) using Nextion Editor to display real-time thermistor readings and oven status.
- Implemented proportional-only control logic on STM32 to regulate oven temperature; tuned on/off switching behavior to maintain $\pm 3^{\circ}\text{C}$ accuracy using relay-driven heating.
- Integrated UART, SPI, and I2C communication protocols for reliable data exchange between STM32, sensors, and actuators.
- Controlled reflow oven temperature using relay modules driven by PID output.
- Developed a responsive web interface using Async Web Server and REST API on ESP32 for remote monitoring and control of the reflow process.

FSAE Car Dashboard ([link](#))

Sep 2024 – Oct 2024

- Developed HMI to display speed, torque, battery temperature, voltage, gyroscope, and GPS coordinates.
- Designed an ESP32-based dashboard that receives real-time sensor data from the car's ECU via CAN bus.
- Built a web interface using Async Web Server and REST API to monitor vehicle data remotely.
- Implemented AJAX and Fetch API for real-time, asynchronous data updates from the ESP32.

Buzz me In

Sep 2024 – Oct 2024

- Programmed ESP32 to control a servo motor that physically pressed a button, triggered by either buzzer sound detection or remote user command.
- Integrated analog sound sensor to identify buzzer activation and initiate automated access response.
- Connected system to the Blynk IoT platform to enable real-time, remote control and status monitoring via mobile app.
- Built a dual-mode access automation system combining local sound-based triggers with cloud-connected IoT control for seamless interaction.

Computer Vision

July 2024 – Aug 2024

- Designed a real-time camera gimbal system with auto-tracking functionality, using a PID control loop to center subjects in the video frame based on facial and object recognition.
- Integrated YOLO and OpenCV in a continuously running Python process to detect faces and calculate positional error relative to frame center.
- Transmitted control signals over UART to a 2-axis gimbal, enabling responsive servo-based orientation adjustments.
- Built a Tkinter-based GUI for manual override and real-time tracking visualization, supporting user interaction and tuning.
- Achieved smooth, automated object tracking with minimal overshoot, improving target stability and real-time response during motion.