Nandan Varma Santhosh

647-233-2321 | nvarmasa@uwaterloo.ca | linkedin.com/in/nandan | github.com/NandanV23

Education

University of Waterloo Sept. 2024 – Apr 2029

*Candidate for Bachelor of Applied Science in Mechatronics Engineering - **3.86 GPA*** *Waterloo, ON*

- **Relevant Coursework**: Circuits, Data Structures & Algorithms, Digital Logic, Sensors and Instrumentation

Technical Skills

Languages: Python, C/C++, TypeScript, HTML, CSS
Libraries/Frameworks: OpenCV, StreamLit, Serial, PyTorch, PynPut, React, YOLOv5, Pandas, NumPy
Developer Tools: Microsoft Office Suite, VS Code, PyCharm, IntelliJ, Dev C++, Git, GitHub
Software: Solidworks, AutoCAD, Autodesk Inventor, Altium Designer, KiCad, Onshape, Arduino, IESVE

Experience

Automation Engineer May 2025 – Present

Quasar Consulting Group *Toronto, ON*

- Developed a Microsoft Word Add-in using the Office JavaScript API and TypeScript, automating document workflows and reducing manual formatting time by 40% for over 200+ users across 8+ sectors.
- Designed and deployed 5+ user-driven features, enabling customized document generation and streamlining approval workflows, resulting in a 25% boost in productivity.
- Refactored over 2,000 lines of outdated code to modern standards, improving performance by 30%, increasing stability, and eliminating 15+ recurring bugs.

Hardware Design Engineer Sept. 2024 – Present

UWaterloo Midnight Sun Solar Race Car Team *Waterloo, ON*

- Designed and optimized 3+ PCBs for solar energy, powertrain, and other systems using Altium Designer, reducing design errors through simulation and testing
- Conducted hardware testing and validation, using oscilloscopes, multimeters, and logic analyzers to diagnose and resolve circuit issues, ensuring PCB functionality and reliability.
- Designed a bidirectional voltage level shifter using MOSFET-based logic, enabling reliable communication between 3.3V microcontrollers and 5V sensors/motor controllers for seamless system integration.

Mechanical Engineering Intern May 2025 – Present

Pratus Group Inc. *Toronto, ON*

- Built energy models for 5+ large-scale institutional and commercial buildings using IESVE, performing precise heat loss/gain calculations that supported HVAC system sizing and envelope optimization.
- Designed HVAC systems in IESVE Apache for buildings totaling over 250,000 ft^2, incorporating VAV systems, DOAS, and heat recovery units in line with ASHRAE 90.1, NECB 2017, and municipal codes.
- Supported the geothermal heating system layout for the Gatineau Preservation Centre (395,000 ft^2 archival facility) by assisting with loop placement, zoning, and load matching, contributing to a projected 30% reduction in heating-related energy use.

Projects

InspectPCB (PCB Defect Detection) | *Python, OpenCV, PyTorch, YOLOv5, StreamLit* Jun. 2025

- Developed a PCB defect detection tool using OpenCV and Python, enabling identification of 5+ defect types (e.g., solder bridges, missing components) with 90% accuracy on test datasets.
- Trained and deployed a YOLOv5-based computer vision model on 1,200+ PCB images from the DeepPCB dataset, reaching 92.3% mAP, and integrated it into a StreamLit web app for interactive PCB quality inspection.

Automated Sink Robot | *RobotC, Mindstorms EV3* Oct. 2024

- Built a smart sink system in C using 3 EV3 sensors (2 ultrasonic, 1 IR) and 4 servo motors, enabling hands-free use with <20 cm detection and 3-tier temperature control (0°C, 50°C, 100°C) via 15 cm/30 cm thresholds.
- Designed a modular embedded system (8 C files) with real-time sensor polling, persistent preferences via ASCII I/O, and dual progress bars refreshing every 50 ms to support a 3-second timer.