Arshya Ghasemi

Waterloo, ON | Arshyag146@gmail.com | (778) 887-8362 | linkedin.com/in/arshya-ghasemi-920b13263 | Arshyaghasemi.com

SKILLS:

Languages: C, C++, Python, MATLAB, LabVIEW, TestStand
Embedded & Hardware: STM32, Sensor Interfacing (SPI, UART, PWM, CAN), PID Control, PDB/ESC Wiring Technical
Tools & Software: Git, Docker, OpenCV, SolidWorks, AutoCAD, LiDAR360, VS Code, Rapid Prototyping (3D Printing)
Spoken Languages: Farsi (Native), English (Fluent)

WORK EXPERIENCE:

Teledyne Dalsa – Aerospace & Defense, Sensor Test Engineer — May 2026 – Aug 2026

- Built Python/TestStand automated scan suites replacing manual filter inspection, cutting tests from 4 hours to 20 min.
- Automated sensor lifetime degradation calculation via Python/Pytest executable, reducing processing 3 hours to 1 min.
- Evaluated low-yield CMOS (IC51/IC49) imaging sensors inside a certified Level 10 cleanroom facility.
- Scripted automated data pipelines to compute critical PRNU, QE, and dark noise metrics.
- Automated temperature coefficient alignments for sensor calibration, directly reducing manual cycles by 35%.

Waterloo Aerial Robotics Group (WARG) – Embedded Software Engineer — Sep 2025 – On-going

- Developed custom C++/Python drivers running DDA algorithms on a Raspberry Pi-powered CNC hotwire foam cutter.
- Synchronized multi-axis stepper motor algorithms to achieve sub-millimeter positioning for aerodynamic airfoils.
- Engineered real-time TECS flight loops in C++ within the primary Fly-By-Wire avionics architecture.
- Programmed custom PID controller featuring integral anti-windup and derivative low-pass filtering.
- Configured STM32 bare-metal registers over SPI, converting analog acquisition channels into PWM outputs.

Capilano University – Undergraduate Engineering Researcher — May 2024 – Aug 2025

Led multi-disciplinary research initiatives spanning quantum computational modeling, autonomous sUAS LiDAR payload integration, and biomimetic robotics. Documented flight procedures, integrated sensor stacks, and developed simulation software to benchmark theoretical systems against physical hardware.

- Designed pre-flight procedures, emergency fail-safe protocols, and validation scripts for LiDAR aerial surveys.
- Processed spatial point clouds, generated classified elevation models, and extracted contour vectors using LiDAR360.
- Resolved LiAir V70 errors by tuning IMU algorithms, eliminating trajectory deviations and noise artifacts.
- Integrated custom avionics stacks (FC, ESC, telemetry) into airframes to ensure stability during LiDAR capture.
- Configured real-time UART/PWM buses between peripheral payloads and flight controllers for synchronized logging.
- Programmed a 2D quantum simulator in C++ and ran D-Wave simulations to validate QPU performance.
- Developed parametric Python scripts to isolate anomalies within simulated quantum environments.
- Optimized thermodynamic algorithms against quantum hardware benchmarks to boost 2D simulator accuracy.
- Modeled an all-terrain biomimetic wheelchair in SolidWorks, translating quadruped mechanics into multi-bar linkages.
- Conducted kinematic motion studies and component FEA to iteratively prototype chassis components for locomotion.

Projects:

Autonomous Maze Navigation & Retrieval Robot (VEX, C++)

- Designed a 3-wheel zero-turn autonomous robot with a geared, rubber-band claw for precise object retrieval.
- Programmed multi-sensor fusion (Optical, Gyro, Distance) for Left-Hand Rule maze solving and dead reckoning.
- Engineered a path-optimization algorithm to log coordinates during exploration and calculate the shortest exit route.

Computer Vision Suite (C++, OpenCV)

- Virtual Paint: Used real-time color detection and contour tracking to turn physical objects to digital markers.
- Document Scanner: An image processing pipeline (Canny, Perspective Transform) to rectify skewed images.
- License Plate Detector: Utilized Haar Cascades - real-time localization and tracking within live video feeds.

Concept V6 Twin-Turbo Engine Design (SolidWorks)

- Modeled a high-fidelity V6 assembly including valvetrain, rotating assembly, and forced-induction systems.
- Conducted Motion Studies and simulated fluid pathways to validate mechanical timing and component clearances.

EDUCATION:

University of Waterloo – BASc in Mechatronics Engineering – Varsity Men's Basketball Captain – GPA: 3.7

Sep 2025 – May 2030

- Relevant Courses: Digital Logic (MTE 262), Data Structures & Algorithms (MTE 140), Digital Computation C++ (MTE 121), Circuits (MTE 120), Linear Algebra (MATH 115), Materials Structure & Properties (MTE 111)
- Varsity Men's Basketball Captain (Waterloo), Academic and Athletic Excellence Award, Scholar-Athlete of the Year