Arnav Arora

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Education

McMaster University - Hamilton **September 2019 - June 2025**

B.Eng. Mechatronics Engineering – Summa Cum Laude *GPA - 3.9*

Coursework: Embedded Systems, Software Development, Robotics, Analog & Digital Circuits, Computer, Networking, Image Processing, Serial Communication, Predictive & Intelligent Control, Mechatronics, RTOS

Experience

Calyan Technologies **Aug. 2025 – Present**

Firmware & Test Engineer *Remote, USA*

- Architected Pytest-based automated test framework for embedded pacemaker firmware validation using serial protocols (UART, SPI, I2C), reducing manual testing cycles by 97% and accelerating firmware iteration velocity.
- Developed FDA-compliant reporting pipeline using pytest and Allure framework to generate standalone HTML reports with embedded visualizations, enabling automated conversion to comprehensive PDF documentation for regulatory submissions.

BlackBerry QNX **May 2024 – August 2024**

Field Application Engineer Co-op *Ottawa, ON*

- Created and documented demonstrations to illustrate BlackBerry QNX's RTOS (SDP7.1 and SDP8) capabilities on platforms like Raspberry Pi4, 16-core Honeycomb, and AWS cloud, enhancing industrial customer engagement and ensuring easy reproducibility.
- Developed real-time embedded ROS2 applications on QNX RTOS using C++ and Python for robotic control and automation, applying real-time principles (latency, determinism, priority scheduling) to guarantee fail-safe operation.

Ericsson **May 2022 – August 2023**

RF Product Integrator Co-op *Ottawa, ON*

- Implemented test and validation methods for efficient integration of hardware and software. Developed all radio calibration and performance optimization procedures in Python, C/C++/C# and Labview.
- Employed embedded programming to automate procedures for flashing radios with software, reducing fatal process errors, and enhancing efficiency by 60%.
- Enhanced proficiency in debugging techniques by actively utilizing RF instruments such as oscilloscopes and network analyzers.
- Followed Agile development process and used Git, Gerrit, and Jenkins for version control and CI.

Projects

Pyramid Stacking with a Medical Robot | *BlackBerry QNX* **May 2024 – August 2024**

- Developed a multi-threaded finite state machine using a series of ROS2 service/action nodes, enabling a Flexiv robot to autonomously identify, manipulate, and stack cubes into a pyramid using tf2 libraries and ArUco markers.
- Enhanced proficiency in thread synchronization, ROS2 service/call architecture, and coordinate system transformations, effectively showcasing the capabilities of Blackberry QNX's safety-certified RTOS to industrial stakeholders.

Station Vision | *Martinrea International, Vaughn* **September 2023 – May 2024**

- Engineered an embedded modular hardware controller to create optimal lighting conditions for existing computer vision ML quality inspection systems for an industry partner.
- Designed and programmed a custom built Arduino Micro using the ATMega32U4 AU/MU chip using KiCAD and Objected Orietned Programming (Python & C/C++) working concurrently with the open source Arduino IDE.

Image Processing Pipeline Development | *McMaster University* **January 2024 – March 2024**

- Developed a MATLAB-based image processing pipeline for demosaicing and denoising noisy Bayer patterns using linear regression, integrating white balance correction, histogram equalization, and performance benchmarking with RMSE.

Tech Stack

Languages: C, C++, Python, Bash, MATLAB, LabVIEW, C#, Java, SimuLink, LT Spice, KiCAD (PCB Design), SQL

Embedded/OS: QNX RTOS, Embedded Linux, Multithreading, Serial Communication (UART, SPI, I2C)

Tools: Git, Gerrit, Jenkins, JIRA, Docker, ROS2, tf2, O2 libraries, OpenCV, PyTest, Allure

Web/Software: Object-Oriented Programming (OOP), REST APIs, Software Architecture, Debugging, Bug Tracking