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Hari Nair

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Education

BASc - Mechatronics & Robotics Engineering *Graduation Year: 2026*
Smith Engineering at Queen's University *Internship Start: May 2025*

Relevant Coursework: Data Structures and Algorithms, Computer Architecture, Digital Systems, Mechatronics Design, Linear Algebra, Signals and Systems
Extracurriculars: **President –** Queen's Malayalee Association
Awards: Dean's List, Dean's Engineering and Applied Science Award, Scholarships totalling up to **$10,000**

Technical Skills

Programming Languages: C, C++, Python, JavaScript, TypeScript, CSS, HTML, SQL
Technologies: React, Next.js, NumPy, Tailwind, Git, Redux, ROS2, Jira, Confluence, Miro, OpenCV, SOLIDWORKS, Fusion360, Foxglove
Databases: MongoDB, PostgreSQL, Firebase
Soft Skills: Agile (LinkedIn Certified), Analytical, Communicative, Cooperative, Responsible, Relationship Builder (CliftonStrengths)

Experience

AI & Technology Intern *May 2024 – August 2024*
City of Orillia

- Initialized an AI HelpDesk Bot categorizing IT tickets, trained on **6000+ tickets**.
- Authored and presented **Generative AI** guidelines to City Council; **received approval and completed within 90 days.**
- Consulted with **5 city-wide businesses**, upgrading equipment and optimizing processes.

Software Developer Intern *January 2024 – August 2024*
Evstry

- Developed the Evstry website connecting **CMS**, **Figma**, **Webflow**, and **React**, achieving a **30% boost** in consumer engagement.
- Guided a **5-man Agile Team** software interns, accelerating task completion in less time expected.

Machine Learning Developer *January 2024 – Present*
GM-SAE AutoDrive Challenge II

- Engineered a sensor-fusion model using C++ and OpenCV, enhancing **performance 25-fold**.
- Created a script with **OpenAI API** to convert datasets to Microsoft VoTT format.
- Represented Queen's University at the GM-SAE AutoDrive Challenge II Winter Workshop in Michigan.

Undergraduate Teaching Assistant *January 2024 – April 2024*
Queen's University

- Educated and mentored as a TA for APSC 142, focusing on the C programming language.
- Directed and supervised approx. **200 students** through hands-on assignments during weekly lab sessions and office hours.

Junior IT Analyst *April 2023 – August 2023*
JANA Corporation

- Reduced **project planning by 10%** by taking an **Agile** approach, improving development of projects.
- Increased productivity by utilizing tools such as **Jira** and **Confluence** for tasks within projects.

Technical Projects

Emergency Response Mobile Robot *Python, C++, ROS2, Arduino*

- Led a **team of 3** in the development of an autonomous emergency response robot using ROS2, Arduino, Python, and C++ aimed at identifying **heat spots in burning buildings** using a **thermal camera**.
- Engineered obstacle avoidance using **LiDAR** and a **PID controller**, significantly enhancing the robot's efficiency and safety.
- Designed the associated mounts using **SOLIDWORKS** and system architecture in **Miro** that facilitated seamless integration of hardware and software components using **ROS2.** Learn More

Image Captioning Model Comparison *Flask, React.js, Keras*

- Worked with an **Agile team of 6** to create and compare four lightweight encoder-decoder models for image captioning with **Keras**, using a modified pretrained **VGG16 convolutional neural network** to extract image features from the Flickr8k dataset.
- Created an interactive website using a **React.js frontend** and **Flask backend** to demonstrate the four models, as well as their bidirectional variants, at the **Canadian Undergraduate Conference on AI (CUCAI)**
- Co-authored and **published a research paper** for CUCAI which analyzes the experiment's findings. Learn More

SLAM Autonomous Robot V2 *Python, C++, ROS2, Arduino*

- Developed a fully autonomous robot using **ROS2, Arduino, Python, and C++,** equipped with a camera for object detection.
- Created a custom odometry ROS node to improve localization accuracy and robot navigation.
- Built a more efficient LiDAR-based obstacle avoidance system and a better tuned PID controller.
- Implemented **SLAM** using **ROS2**, improving navigation in complex environments.
- Integrated **Foxglove** for real-time visualization and analysis of robotics data. Learn More