Nikolas "Dax" Manuel

Canadian Citizen

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Education

University of New Brunswick — Fredericton, NB

B. S. Software Engineering (Co-op), Minor in Mathematics — *Sep 2024 – Apr 2028*

- **Relevant Coursework:** Electrical Circuits, Data Structures & Algorithms, Software Engineering, System Design.

Technical Skills

Languages: C/C++, Python, Java, JavaScript, SQL
Frameworks/Libraries: Spring Boot, PyTorch, NumPy, Pandas
Developer/Engineering Tools: Git, AWS, Google Cloud Platform, Postman, Docker, Linux, Jira

Experience

UNB EV Formula Racing — Sep 2025 – Present

Electrical Member — *Fredericton, NB*

- Designed a PCB schematic to integrate with a potentiometer as an acceleration pedal position sensor to implement into the low-voltage system with the vehicle control unit.
- Authored technical documentation for the APPS system integration to enable team knowledge transfer and long-term maintainability.
- Working on wiring harness research/implementation to ensure reliable signal transmission across the low-voltage system.

Intelligent Mobility and Robotics Lab — Feb 2026 – Present

Research Assistant — *Fredericton, NB*

- Contributing to computer vision research for safe speed estimation in semi-autonomous trucks in varying road and weather conditions using machine learning.
- Processing and annotating autonomous driving datasets to prepare for training computer vision based models.

Projects

Neural Network From Scratch in C | GitHub

- Built a neural network handwritten digit classifier with the MNIST dataset in C achieving **98% accuracy**.
- Implemented matrix operations, back-propagation, gradient descent, and Relu + Softmax activation functions.
- Designed dynamic memory allocation for neural network tensors and matrices to eliminate memory leaks.

Vehicle Perception Model | GitHub

- Implemented PointPillars architecture for 3D object detection from LiDAR point clouds, building complete pipeline from data preprocessing to bounding box prediction with visualization.
- Preprocessed **150,000+** LiDAR frames from the Waymo Open Dataset, converting Parquet formatted data into NumPy arrays for neural network training in **PyTorch.**
- Reduced training time by **75%** by leveraging **AWS EC2** instances to perform scalable training.

HR System | CS2043 Term Project

- Led a group of four as scrum master, to build a full stack application integrating **RESTful API** architecture with **Spring Boot/Java**, JavaScript, and PostgreSQL, following Agile methodology.
- Designed **PostgreSQL** relational database schemas and API endpoints to support scalable complex queries.
- Managed tasks and sprint planning using Jira by organizing backlog items and tracking sprint progress.
- Implemented unit tests with JUnit and Postman to validate RESTful API ensuring correct request handling and responses for software validation and performed debugging, slashing errors by **99%**.