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 | Dean's List 2024-2025 — *Sep 2024 – Apr 2028*
- **Relevant Coursework:** Data Structures & Algorithms, Software Engineering, Databases, System Design.

Technical Skills

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

Experience

Intelligent Mobility and Robotics Lab — Jan 2026 – Present

Automotive 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.

UNB Formula Electric — Sep 2025 – Present

Electrical Powertrain Member — *Fredericton, NB*
- Translated FSAE competition requirements into technical specfications and integrated the APPS to the EV low-voltage system.
- Authored technical documentation for the APPS system integration to enable team knowledge transfer and long-term maintainability.

Projects

Neural Network From Scratch in C | GitHub | *C* — Feb 2025
- 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.

Vehicle Perception Model | GitHub | *Python, PyTorch, NumPy, Pandas, AWS* — Nov 2025 - Jan 2026
- 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 convolutional neural network training in **PyTorch.**
- Reduced training time by **75%** by leveraging **AWS EC2** instances to perform scalable training.

HR System | CS2043 Term Project | *Spring Boot, JavaScript, HTML/CSS, PostgreSQL* — Sep 2025 – Nov 2025
- 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%**.

AI-Powered CAD Automation Tool | McHacks '26 | *FastAPI, Next.js, Gemini API* — Jan 2026
- Developed a CAD automation application converting natural-language prompts into fully exportable 3D models in **under four seconds** with Gemini API and **FastAPI**, enabling non-technical users to create CAD models.
- Leveraged prompt engineering to optimize Gemini API output consistency and geometric accuracy.