Alexander Wang

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EXPERIENCE

SpaceX | *C++, Python, Docker, Kubernetes, Linux* May 2025 – Present
Software Engineering Intern – Satellite Bus Engineering Team *Redmond, WA*

- Developing flight software for the next generation of Starlink v3 satellites.

General Motors | *MATLAB, Simulink, C++, Python* May 2024 – April 2025
Software and Controls Intern – Electric Vehicle Propulsion and Thermal Management *Markham, ON*

- Utilized embedded C to develop thermal control system software for battery, power electronics, and cabin comfort.
- Created automated test stands on dedicated physical servers (bare-metal) for Software-in-the-Loop co-simulations.
- Developed a testing and analysis pipeline in Python – automating performance analysis from **4-5 days to minutes**.

SAE AutoDrive – Toronto Autonomous Vehicle Team (aUToronto) | *C++, Python, ROS2, Linux* 2023 – Present
State Estimation Lead *Toronto, ON*

- Led autonomous vehicle team to win **1ST place** in every competition event at the R2Y3 SAE AutoDrive Challenge.
- Developed C++ multi-sensor fusion algorithms (i.e., Extended Kalman Filter) for state estimation and localization and designed integrity monitoring system against sensor failures (GPS, IMU, Wheel Encoders, LiDARs, and Cameras).
- Implemented deep learning visual semantic and inertial LiDAR odometry algorithms for GNSS-unavailable localization.

RESEARCH & PUBLICATIONS

University of Toronto – Toronto Robotics + AI Lab (TRAIL) | *Python, AWS, OpenStreetMap* May 2024 – Present
AI & Robotics Researcher – 3D Lane Detection / Labeling for Autonomous Vehicles *Toronto, ON*

- Developing a Bayesian Attention-based 3D lane detection model and the development of BoreasLane, the first 3D winter condition lane dataset; targeting submission to the Winter Conference on Applications of Computer Vision (WACV).
- Integrated GPS, Camera, and LiDAR sensor data into automated lane labeling and refinement pipeline – using multi-threading, multi-processing, and caching to **decrease runtime by 43%**.

PROJECTS

TARS-AI – Open Source Community | *Python, Raspberry Pi, Fusion360, GitHub* Dec. 2024 – Present
Co-Founder *Global*

- Co-founded and led the development of TARS-AI, an open-source robotics community dedicated to creating the robot TARS from my favourite childhood film Interstellar – growing the community to **500+ members** since launch.
- Designed a modular software architecture for speech, personality, memory, intent classification, vision and servo control.
- Configured sensors, servos, and peripherals to GPIO, I2C, SPI, and I2S interfaces – troubleshooting with a multimeter.

EDUCATION

University of Toronto: cGPA 3.6/4.0 Toronto, ON
Engineering Science - Robotics Engineering (AI Minor) *Expected: April 2026*

Certificates: TensorFlow Developer Certificate || Oracle Database SQL Certified Associate
Courses: Intro to Artificial Intelligence || Intro to Learning From Data || Introduction to Robotics || Mathematics for Robotics

SKILLS

Skills: C/C++, Python, MATLAB, Simulink, Fusion360, Linux, Shell/Bash, AWS, JavaScript, React, SQL, OracleDB, Git, Jenkins, JIRA
Embedded Systems: CAN, Ethernet, LIN, GPIO, I2C, SPI, I2S, ROS/ROS2, Raspberry Pi, STM32, Arduino, DE1-SoC FPGA
Machine Learning: PyTorch, TensorFlow, Keras, Scikit-Learn, OpenCV, Hugging Face, numpy, scipy, pandas