

ALEXANDER WANG

← Click Here

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SKILLS

Skills: Python, C/C++, AWS, Shell/Bash, MATLAB, Simulink, MySQL/SQL, JavaScript, React, OracleDB, Git, JIRA, Jenkins

Testing & Simulation Tools: CppUTest, Google Test, GMock, pytest, Simulink, Gazebo, RViz

Embedded Systems: ROS/ROS2, Raspberry Pi, STM32, Arduino, DE1-SoC FPGA, Moveit2, Turtlebot 3 Waffle Pi

EDUCATION

University of Toronto: cGPA 3.6/4.0

Toronto, ON

Robotics Engineering

Sep. 2021 – May 2026

Certificates: Private Pilot's License (PPL) || Radio Operator Certificate || Oracle Database SQL Certified Associate

Courses: Computer Algor. & Data Structs || Control Systems || Dynamics || Microcontrollers & Embed. Microprocessors

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

- Advancing cutting-edge research on enabling autonomous vehicles to operate in adverse weather (e.g., winter, night).
- Integrated GPS, Camera, and LiDAR data into automated detection / labeling pipeline – **decreasing runtime by 43%**.
- Authoring 2 papers** on a Bayesian Attention-based 3D lane detection model and the development of BoreasLane, the first 3D winter condition lane dataset; targeting submission to the International Conference on Computer Vision (ICCV).

EXPERIENCE

General Motors | *MATLAB, Simulink, C++, Python*

May 2024 – Present

Software and Controls Intern – EV Propulsion and Thermal Management

Markham, ON

- Utilized MATLAB / Simulink to develop thermal control system software for battery, power electronics, and cabin comfort.
- Designed and implemented a novel C++ testing architecture from the ground up with the CppUTest framework.
- Developed a testing and analysis pipeline in Python – automating performance analysis from **4-5 days to minutes**.
- Created automated virtual test stands for Software-in-the-Loop co-simulations to validate control algorithms.

SAE AutoDrive – Toronto Autonomous Vehicle Team (aUToronto) | *C++, Python, ROS2, Linux* Sep. 2023 – Present

State Estimation Lead, Founder

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).
- Programmed a variable L-Band attenuator to simulate GPS signal dropouts through Serial during in-vehicle testing.
- Developed offset calibration algorithms in Python – correcting global GPS position / heading errors **by 87%**.

RTX – Pratt & Whitney | *HTML/CSS, JavaScript, React, SQL, OracleDB* May 2022 – Aug 2022 || May 2023 – Aug 2023

Software Engineering Intern – Control Systems Team

Mississauga, ON

- Developed multiple scalable full stack software tools with JavaScript and React for project and requirements management – improving the Control Systems team's project delivery times **by 15%**.

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 community project dedicated to creating the robot TARS from my favourite childhood film Interstellar – growing the community to **50+ members** within **1 month** of launch.
- Designed a modular architecture, with modules for speech, personality, memory, intent classification, and servo control.