Tom Wang

(647) 852-7705 | zxTomw.com | tom.wang3@uwaterloo.ca | linkedin.com/in/zxtomw | github.com/zxTomw

Technical Skills

Languages: C++, Python, Java, TypeScript/JavaScript, SQL, HTML, CSS
Developer Tools: Docker, colcon, Gazebo, ROS bags, RViz, Foxglove Studio, Nginx, Kubernetes, Make
Frameworks: ROS/ROS2, rclpy/rclcpp, OpenCV, TensorFlow, Pandas, NumPy, Scikit-learn, SocketIO

Experience

Robotics and Fullstack Software Engineer May – Aug 2025
Studica Limited *Mississauga, ON*

- Implemented and fine-tuned SLAM, localization and navigation algorithms for mobile robots with ROS2.
- Developed robot sensor data and ROS2 transformation visualization in React using PixiJS and TypeScript, allowing users to inspect composed robot sensor feedback in a lightweight 2D view.
- Re-engineered the existing educational graphical programming interface to support event-based programming; re-implemented code generation modules of the compiler to output asynchronous ROS2 Python code.
- Containerized web servers and ROS2 nodes with Docker to streamline the deployments and testings; Composed scripts to automate packaging and upload of the client libraries.
- Implemented toolings for robot simulations with URDF and Gazebo.

Autonomous Software Developer Jan – Apr 2025
WATonomous *Waterloo, ON*

- Implemented a robot pathfinding algorithm that accounts for detected obstacles using ROS and C++.
- Integrated a monocular depth estimation algorithm to the perception node of the autonomous vehicle.
- Researched machine learning algorithms for camera/sensor anomaly detection.

Remote Healthcare IoT Software Engineer Jan – Aug 2024
Mespere Lifesciences & Faculty of Science, University of Waterloo *Waterloo, ON*

- Visualized vital data in real-time using WebSocket, React and WebGL, reduced delay by 40%.
- Implemented SSR with NextJS to optimize performance and implemented 20+ server components.
- Engineered a highly scalable serverless backend using TypeScript, Azure Functions, and CosmosDB.

Projects

AllSet | *React Native, Expo, LangChain, NestJS*

- Implemented a recipe searching & recommendation AI agent.
- Used **React Native**, **Expo** and react-native-reanimated to build a user friendly frontend.
- Implemented structured output and tool calling with **LangChain**. Built an adapter pattern for multiple LLMs.
- Implemented semantic search API and SSE for LLM output streaming backend with **Nest**.

LiDAR-based Pathfinding Robot | *C++, CMake, Docker, ROS2, Foxglove*

- Developed software for a differential wheeled robot that navigates independently on LiDAR data using **ROS2**.
- Implemented the cost map node to analyze raw LiDAR inputs and mark-up obstacles on local and global maps.
- Utilized the **A*** algorithm to generate the shortest paths and avoid collisions

NaviGoose | *Python, OpenCV, YOLO, PyTorch, Django, Websocket, OpenAI* GeeseHacks 2025

- Built an IoT AI hardware with **Raspberry Pi** and **Django** to help visual-impaired individuals avoid collisions.
- Trained an object detection network using **YOLO** models and **OpenCV** to identify 100+ types of hazards.
- Tailored personalized vocal warnings via **OpenAI** and **LangChain** SDK; achieved an average accuracy rate of 95% in identifying hazardous conditions while assisting over 50 test participants during field trials.

PersonalNotes | *TypeScript, NextJS, OpenAI, Flask, Google Cloud, PostgreSQL* Hack the North 2024

- Developed an **AI agent** to aggregate and summarize documents and notes with **NextJS** and **Tailwind CSS**.
- Leveraged OpenAI **vector embeddings** to construct knowledge bases from uploaded materials.

Education

University of Waterloo Waterloo, ON
3rd Year Bachelor of Computer Science, Honours *Sept. 2022 – Apr. 2027 (Anticipated)*

- Relevant Coursework: Statistics, Numerical Computation, Application Development, Database Management, Algorithms, Operating Systems