David Wu

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Education

University of Waterloo | *BASc Systems Design Engineering,* **4x** Dean's List, **4.0/4.0** cGPA ***Expected Apr 2026***
Courses: Deep Learning, Mobile Robotics, System Modelling, Machine Learning

Experience

Control, Learning & Logic (CL2) Lab *Sep 2025 – Present*
Research Associate under Professor Yash Pant *Waterloo, ON*

- Researching hybrid control systems by blending reinforcement learning with neural network advancements for autonomous racing simulations

dConstruct Robotics *May 2025 – Aug 2025*
Research Intern *Singapore, SG*

- Developed a secure **Docker** CI/CD pipeline that encrypted Python code to bytecode using **Cython**, enabling new partnership with **Softbank** to scan the future **OpenAI Stargate datacenter**
- Implemented **multi-modality** cues (depth, normal, DiNOv2) in 3D gaussian splatting to improve geometrical reconstruction and final mesh fidelity by **50%**
- Leveraged large image **foundation models** (VGGT) to generate and align dense point clouds with LiDAR data, creating **100%** denser initializations for gaussian splatting
- Accelerated a **PyTorch**-based image pre-processing pipeline (object detection, depth/normal generation) by over **300%** using **multi-GPU parallelization**

Clearpath Robotics by Rockwell Automation *Sep 2024 – Dec 2024*
Perception Engineering Intern *Waterloo, ON*

- Developed high-performance **C++** tools for map cropping and zone filtering for robot localization, cutting search times and RAM usage by **10x** in 2M sqft facilities.
- Owned and implemented an end-to-end simulation benchmark and analytics dashboard in Python, optimizing robot parameters using Evolutionary Algorithms and decreasing CPU usage of critical processes by **28%**
- Implemented a Wi-Fi-based triangulation system in **C++**, reducing search areas for robot recovery by **50%**

Vision and Image Processing (VIP) Lab *Apr 2024 – Dec 2024*
Research Associate under Professor Paul Fieguth *Waterloo, ON*

- Developed a **self-supervised learning** model for insect classification, processing over **5M** records with a scalable **PySpark** pipeline to enhance phylogenetic diversity research.
- Reduced model computational overhead by **25%** by introducing a novel **hierarchical knowledge distillation** framework with parent-teacher momentum models

Clearpath Robotics by Rockwell Automation *Jan 2024 – Apr 2024*
Perception Test Engineering Intern *Waterloo, ON*

- Independently contributed a high-performance 3D perception testing pipeline in **C++**, compressing **9+** hours of footage into **8** minutes while covering **>80%** of regression scenarios
- Built efficient point cloud comparison tools using **C++ K-d trees** for 3D perception algorithms, achieving a **10x speedup** over real-time playback

Genesys *May 2023 – Aug 2023*
Software Engineering Intern *San Francisco, CA*

- Developed an integration microservice for synchronous external e-learning webhooks using AWS Lambda, API Gateway, and CloudFormation, resulting in **2 new corporate clients** joining the beta program

Projects

Loop *Autonomous outdoor 400 meter lap RC car*

- Developed a hybrid lane-keeping and person-following **ROS2** autonomy stack, achieving 100% lap completion and 40% smoother steering in outdoor environments using ZED2 stereo vision

Skills

Languages C++, Python, Java/Kotlin, SQL, Swift
Technologies PyTorch, ROS, Docker, AWS, GCP, PySpark, PostgreSQL, MongoDB, Linux, Spring Boot, Flask