

Hotsuyuki Kawanishi

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SUMMARY

Software Engineer with 4 years of experience in Autonomous Robot (Perception, Motion Planning) and ML (Computer Vision, LLM). Graduating with a Master's degree in Software Engineering in Dec 2025, and eligible for 3 years of US work through STEM OPT.

EXPERIENCE

Waymo, Mountain View, California

May 2025 – Aug 2025

Software Engineer (intern), Self-Driving Car - Perception

- Improved the performance (PR curves and mIoUs) of the lidar semantic segmentation task, which is one of the main tasks of a multimodal perception model, by inputting noise point cloud in addition to non-noise point cloud and co-training the model with a noise-aware auxiliary task alongside the main tasks. The ML frameworks used were TensorFlow and JAX in Python.

University of Tokyo AI Lab (Matsuo Lab), Tokyo, Japan

Jan 2024 – Aug 2024

Machine Learning Engineer (part-time), LLM

- Rapidly acquired necessary expertise in LLM within 1 month despite working full-time in a different field (Self-Driving Car), and built an LLM distributed training pipeline with PyTorch, Microsoft DeepSpeed, and Hugging Face Transformers in Python, achieving successful training of a GPT-based 10B generative model on 160 Nvidia H100 GPUs via Google Cloud GPU cluster.
- Led a lecture on pre-training in an online LLM course with 4,000+ participants, accomplishing the highest Net Promoter Score.

Woven by Toyota, Tokyo, Japan

May 2021 – Aug 2024

Software Engineer (full-time), Self-Driving Car - Motion Planning

- Decreased driver interventions in JP by 30% by debugging the trajectory planning modules in C++ with teams in the US, e.g. triaging log data, identifying root causes on large C++ codebases, articulating solutions, and managing vehicle experiments.
- Streamlined simulation scenario generation process for the motion planning team by 3x efficiency by creating automation scripts in Python that leverage Applied Intuition API and by leading cross-functional collaboration with teams in the US.
- Enhanced safety validation for Level 4 driverless autonomous vehicles by designing and implementing a prediction evaluator in C++ with software development life cycle best practices, e.g. object-oriented design, code standards, code reviews, and testing.

Kanazawa University Advanced Mobility Research Institute, Kanazawa, Japan

Apr 2020 – Mar 2021

Research Engineer (full-time), Self-Driving Car - Perception

- Developed perception features in C++ by applying research theories to practical applications in a fast-paced culture, including a speed bump detector using lidar point cloud and probabilistic approaches (successfully delivered to a customer company) and a lane line visibility checker using lidar-camera sensor fusion and linear algebra (published in an international journal paper).
- Improved map data collection process for autonomous vehicles by 2x efficiency by creating a real-time mapping tool in C++.
- Mentored 4 lab students, resulting in 1 paper publication at IEEE IV and 1 patent filing, by providing hands-on guidance.

EDUCATION

University of Miami, Coral Gables, Florida | M.S. in **Software Engineering** (GPA: 4.00)

Dec 2025

Relevant Courses: Machine Learning, Neural Networks, Algorithm Design and Analysis, Software Architecture, Software DevOps

Kanazawa University, Kanazawa, Japan | M.Eng. in **Robotics** (GPA: 3.93)

Mar 2020

Relevant Courses: Intelligent Robotics, Dynamics and Control, Master's Thesis on Localization & Mapping for Self-Driving Car

Chiba University, Chiba, Japan | B.Eng. in **Mechanical Engineering** (GPA: 3.87)

Mar 2017

Relevant Courses: Linear Algebra, Calculus, Numerical Computation, Analytical Mechanics, Control Theory, Mechatronics

National Institute of Technology Numazu College, Numazu, Japan | A.Eng. in **Computer Science** (GPA: 3.81)

Mar 2015

Relevant Courses: Data Structures and Algorithms, Programming, Operating Systems, Computer Graphics, Computer Simulation

SKILLS

Languages / Technologies: C/C++, Python, Shell Script, JavaScript, PHP, SQL, PyTorch, TensorFlow, JAX, Microsoft DeepSpeed, Hugging Face Transformers, Jupyter Notebook, React, FastAPI, AWS, Azure, GCP, Docker, Jenkins CI, Slurm, Bazel, Git, Linux, CLI

PROJECTS

[LLM Distributed Training Pipeline](#) | Python, PyTorch, DeepSpeed, Transformers, Distributed Systems

Apr 2024

- Scalable LLM distributed training pipeline on large GPU clusters using DeepSpeed ZeRO, 3D Parallelism, and Transformers.

[C++ Deep Learning Framework from Scratch](#) | C++, Bazel, Object-Oriented Programming, Unit Testing

Aug 2022

- PyTorch-like deep learning framework designed and implemented from scratch in C++, e.g. layers, optimizers, and autograd.

[Object Detection Model in PyTorch C++ with TensorRT](#) | C++, PyTorch, TensorRT, Conv Neural Net (CNN)

Jan 2021

- Computer Vision object detection model implemented in PyTorch C++ with TensorRT for real-time inference in production.

[Robotics Algorithms in Jupyter Notebook](#) | Python, Robotics, SLAM, Localization, Path Planning

Sep 2020

- Python robotics algorithms: SLAM (Graph SLAM), localization (Kalman Filter, Particle Filter), and path planning (RRT, A*).