

Hotsuyuki Kawanishi

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SUMMARY

Software Engineer with 4+ years of professional experience in Machine Learning (Large Language Model, Computer Vision) and Self-Driving Car (Mapping, Localization, Perception, Motion Planning). Eligible for US internship under CPT in Summer 2025.

EXPERIENCE

Machine Learning Engineer, LLM (part-time) | University of Tokyo Matsuo Lab (JP) | Python Jan 2024 - Aug 2024

- Built an LLM distributed training [pipeline](#) with Microsoft Megatron-DeepSpeed and Hugging Face TRL, attaining successful training of an OpenAI GPT-based 10B-param 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, achieving the highest Net Promoter Score.

Software Engineer, Self-Driving Car (full-time) | Woven by Toyota (JP) | C++, Python May 2021 - Aug 2024

- Enhanced safety validation for Level 4 driverless autonomous vehicles by designing and implementing a prediction evaluator with Agile methods and software development life cycle best practices, e.g. object-oriented design, code reviews, and testing.
- Decreased driver interventions in JP by 30% by fixing bugs in decision making and trajectory planning with teams in the US, e.g. triaging failures, identifying root causes on a large codebase, articulating solutions, and coordinating vehicle experiments.
- Streamlined and accelerated simulation scenario generation process for the motion planning team by 3x efficiency by creating automation scripts leveraging Applied Intuition API and collaborating with multiple cross-functional teams in the US.

Research Scientist, Self-Driving Car (full-time) | Kanazawa University Autonomy Lab (JP) | C++, Python Apr 2020 - Mar 2021

- Improved map data collection process for autonomous vehicles by 2x efficiency by creating a real-time map generation tool.
- Developed perception and motion planning features by applying research findings into practice in a fast-paced environment:
 - Speed bump detection with LiDAR point cloud and probabilistic method, delivered to the customer company successfully.
 - Lane line visibility check with LiDAR-camera sensor fusion and linear algebra, published in an international journal [paper](#).
 - Traffic deadlock resolution with A*-like path planning and computational geometry, published in a national project [report](#).
- Successfully mentored 4 lab students, resulting in 1 [patent](#) filing and 1 [paper](#) publication, by providing hands-on guidance.

Software Engineer, Web (internship) | Cultural Vistas (US, New York) | JavaScript, PHP, SQL Jul 2017 - Dec 2017

- Developed and debugged the web front-end and back-end in a diverse, multicultural environment of 5 software engineers.
- Granted a \$10,000 Japanese government scholarship for demonstrated leadership and commitment to learning tech in the US.

EDUCATION

M.S. in Software Engineering | University of Miami (US, Florida) Dec 2025 (GPA 4.00/4.00 at present)

- Researching a neuroscience-inspired neural net training algorithm as an alternative to backprop for reinforcement learning.
- Relevant coursework: Machine Learning, Algorithms, Software Requirements, Software Architecture, Software DevOps.

M.Eng. in Robotics | Kanazawa University (JP) Mar 2020 (GPA 3.93/4.00)

- Published a [paper](#) on mapping & localization for self-driving cars at an international conference during the master's program.
- Won 1st place in a startup pitch contest among 10 teams by demonstrating an UberPool-like algorithm for chauffeur services.

B.Eng. in Mechanical Engineering | Chiba University (JP) Mar 2017 (GPA 3.87/4.00)

- Transferred as a junior undergrad, changing my major from Computer Science to Mechanical Engineering to learn Robotics.

Associate of Eng. in Computer Science | National Institute of Technology, Numazu College (JP) Mar 2015 (GPA 3.81/4.00)

- Studied both Computer Science and Electrical Engineering and co-authored a [paper](#) on electromagnetism with a professor.

OPEN SOURCE CONTRIBUTION

- [matsuolab/ucllm_nedo_prod](#): [Python] LLM training pipeline using Microsoft Megatron-DeepSpeed and Hugging Face TRL.
- [microsoft/Megatron-DeepSpeed \(#455\)](#): [Python] Fixed a bug in a script that converts deep learning model checkpoints.
- [AtsushiSakai/PythonRobotics \(#407\)](#): [Python] Modified a rotation matrix calculation and introduced more intuitive code.
- [ryuichiueda/LNPR_BOOK_CODES \(#4\)](#): [Python] Corrected math and code for Graph-based SLAM in a robotics textbook.

SIDE PROJECT

- [hotsuyuki/HuggingGPT-function-calling](#): [TypeScript, Python] Agentic AI web app to use external APIs by GPT on Azure.
- [hotsuyuki/tensorward](#): [C++] C++ deep learning framework implemented from scratch, e.g. layers, optimizers, autograd, etc.
- [hotsuyuki/YOLOv5_PyTorch_cpp](#): [C++] Implementation of YOLOv5 using PyTorch C++ (instead of PyTorch Python).
- [hotsuyuki/Traffic_Sign_Recognition](#): [Python] Implementation of CNN neural network classifier using TensorFlow Python.
- [hotsuyuki/Graph-Based-SLAM](#): [C++, Python] Math explanation of Graph-based SLAM with C++ and Python sample code.
- [hotsuyuki/IpynbRobotics](#): [Python] Jupyter Notebooks for robotics algorithms including SLAM, localization, path planning.