NHAT LUONG

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EDUCATION

Ph.D. in Systems and Control Engineering, Tokyo Institute of Technology, Japan — Expected 2025

Master of Systems and Control Engineering, Tokyo Institute of Technology, Japan — 2020 - 2022

Bachelor of Mechatronics Engineering, Hanoi University of Science and Technology, Vietnam — 2014 - 2019

SKILLS

Technology stack C++, Python, (Inverse) Reinforcement Learning, Motion and Path Planning, ROS, Docker, Git Embedded Systems, IoT, Unity, SQL, Apache TVM, CAD, Java

Soft Skills English (IELTS 7.0), Japanese (N2), Vietnamese, Microsoft Office

EXPERIENCE

Research Intern — October 2023 - February 2024
Mitsubishi Electric Corporation - Information Technology R&D Center — *Kanagawa, Japan*

- Contributing to open source Apache TVM, an open-source machine learning compiler framework for CPUs, GPUs, and machine learning accelerators.

Researcher - PhD Candidate — September 2020 - now
Tokyo Institute of Technology — *Tokyo, Japan*

- Using deep inverse reinforcement learning to learn the odor search strategy of the silkworm moth in nature and export a reward function from it to apply to the autonomous mobile robot for safety and rescue tasks.
- Developing a mixed reality app in Unity to visualize gas source probabilities and suggest odor sampling paths for gas leak localization. Data is exchanged between DIY gas sensors and Meta Quest 2 via MQTT protocol.
- Developed planning algorithms switching framework for odor source searching robot in the environment with obstacles.
- Constructed gas distribution map from sparse gas measurements collected by an autonomous mobile robot.

Back-End Developer — October 2019 - September 2020
Giao Hang Tiet Kiem Joint Stock Company — *Hanoi, Vietnam*

- Developed real-time data-assisted system on package handling, and work shifts for workers, and truck drivers (WMS and WCS) for E-commerce services.
- Designed and built up auto-sorting conveyor system units using the high-speed barcode reader to read the barcode of packages and sort the packages to the desired destination.
- Developed Android applications for mobile phones, TVs, and Led boards to visualize data related to the package sorting process.

Research Assistant (intern) — March 2019 - May 2019
National Taiwan University of Science and Technology — *Taipei, Taiwan*

- Implemented the integration of camera and ultrasonic sensors into Automated Guided Vehicles for warehouse environments.
- Designed path planning package for AGV in ROS using RRT* algorithm. The package was programmed in C++ and tested in Rviz simulation and real-world experiments with DIY mobile robot.

Mechanical Engineer (intern) — June 2018 - August 2018
DKS Production and Trading Co., Ltd — *Hanoi, Vietnam*

- Created precise 3D models of mechanical and electronic components using CAD software such as Autodesk Inventor and SOLIDWORKS, customized to meet specific customer requirements.

PUBLICATIONS

- **Duc-Nhat Luong**, and Daisuke Kurabayashi. 2023. "Odor Source Localization in Obstacle Regions Using Switching Planning Algorithms with a Switching Framework" *Sensors* 23, no. 3: 1140.

- Toshi Ogawa, **Duc-Nhat Luong**, Shunsuke Shigaki, Daisuke Kurabayashi. "Three-degree-of-freedom sampling strategy for chemical plume tracing in the two-dimensional plane" *The Proceedings of JSME annual Conference on Robotics and Mechatronics (Robomec)* 2022:2A1-O09.
- **Duc-Nhat Luong**, and Daisuke Kurabayashi. 2021. "Switch planning algorithms for odor source localization in obstacle region based on the entropy gain rate of information" *AROB-ISBC-SWARM* 2022.
- Kei Okajima, Shunsuke Shigaki, Takanobu Suko, **Duc-Nhat Luong**, Cesar Hernandez Reyes, Yuya Hattori, Kazushi Sanada, Daisuke Kurabayashi. 2021. "A novel framework based on a data-driven approach for modelling the behaviour of organisms in chemical plume tracing" *J. R. Soc. Interface* 18: 20210171.
- Thi Thoa Mac, Chyi-Yeu Lin, **Duc-Nhat Luong**, Nguyen Gia Huan, Pham Cong Hoang, and Hoang Hong Hai. 2021. "Hybrid SLAM-based Exploration of a Mobile Robot for 3D Scenario Reconstruction and Autonomous Navigation" *Acta Polytechnica Hungarica* 18, no. 5, 197–212.