

# NHAT LUONG

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## EDUCATION

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<b>Ph.D. in Systems and Control Engineering</b> , Tokyo Institute of Technology, Japan	Expected 2025
<b>Master of Systems and Control Engineering</b> , Tokyo Institute of Technology, Japan	2020 - 2022
<b>Bachelor of Mechatronics Engineering</b> , Hanoi University of Science and Technology, Vietnam	2014 - 2019

## SKILLS

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<b>Technology stack</b>	C++, Python, (Inverse) Reinforcement Learning, Motion and Path Planning, ROS, Docker, Git Embedded Systems, IoT, Unity, SQL, Apache TVM, CAD, Java
<b>Soft Skills</b>	English (IELTS 7.0), Japanese (N2), Vietnamese, Microsoft Office

## EXPERIENCE

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<b>Research Intern</b> Mitsubishi Electric Corporation - Information Technology R&D Center	October 2023 - February 2024 <i>Kanagawa, Japan</i>
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- Contributing to open source Apache TVM, an open-source machine learning compiler framework for CPUs, GPUs, and machine learning accelerators.

<b>Researcher - PhD Candidate</b> Tokyo Institute of Technology	September 2020 - now <i>Tokyo, Japan</i>
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- 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.

<b>Back-End Developer</b> Giao Hang Tiet Kiem Joint Stock Company	October 2019 - September 2020 <i>Hanoi, Vietnam</i>
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- 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.

<b>Research Assistant (intern)</b> National Taiwan University of Science and Technology	March 2019 - May 2019 <i>Taipei, Taiwan</i>
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- 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.

<b>Mechanical Engineer (intern)</b> DKS Production and Trading Co., Ltd	June 2018 - August 2018 <i>Hanoi, Vietnam</i>
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- 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

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- **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.