# Quang Nhat Nguyen

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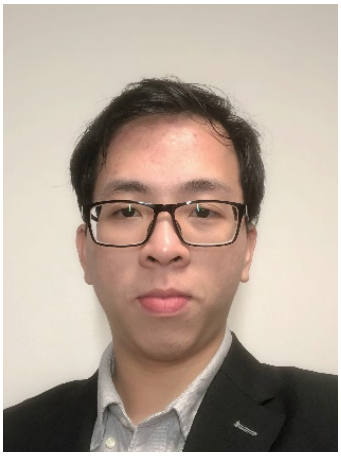
Citizenship: Vietnamese
Languages: Vietnamese, English, Japanese



## Affiliated Research Institute

April 2020 – Present

**Takeda Laboratory**

Perception of Autonomous Driving Systems Research Group

Department of Intelligent Systems, Graduate School of Informatics, Nagoya University

## Current Research Topic

**Learn to classify materials from multispectral and multimodal perception data: A novel approach for semantic segmentation**

*Research interests:* Data science, Computer vision, Artificial intelligence, Intelligent systems, Autonomous driving systems, Digital twin reconstruction.

## Professional Experience

September 2022

**Researcher Intern** at RIKEN Centre for Computational Science (R-CCS)

In participation in the High-Performance Computing (HPC) Computational Science Research Internship

April 2022 – Present

**Research Assistant** at NEDO (New Energy and Industrial Technology Development Organisation)

November 2021 – March 2022

**Research Assistant** at JARI (Japan Automobile Research Institute)

## Education

October 2021 – September 2023 (expected)

**Master of Engineering in Electrical Engineering**

Nagoya University, Japan

October 2017 – September 2021

**Bachelor of Engineering in Electrical Engineering, Electronics, and Information Engineering**

Nagoya University, Japan

August 2014 – May 2017

**High School Diploma with specialisation in Mathematics**

Le Quy Don High School for Gifted Students, Da Nang City, Vietnam

## Publications

### Physics-based LiDAR waveform simulation method for realism improvement of driving simulators

Quang Nhat Nguyen, Alexander Carballo, and Kazuya Takeda
*International Symposium on Future Active Safety Technology toward zero-traffic-accident 2021 (FAST-zero'21)*

### On radial Schrödinger operators with a Coulomb potential: general boundary conditions

Jan Dereziński, Jérémy Faupin, Quang Nhat Nguyen, and Serge Richard
*Advances in Operator Theory 5, pp. 1132 – 1192, July 2020*
DOI: 10.1007/s43036-020-00082-6

## Grants / Scholarships

October 2021 – Present
### Japan Government's Scholar

Recipient of MEXT Scholarship as a graduate student, awarded by the Ministry of Education, Culture, Sports, Science and Technology of Japan

October 2017 – September 2021
### Japan Government's Scholar

Recipient of MEXT Scholarship as an undergraduate student, awarded by the Ministry of Education, Culture, Sports, Science and Technology of Japan

## Honours / Awards

### Valedictorian graduate of Nagoya University School of Engineering (class of 2021)
September 2021, awarded by Nagoya University.

### Outstanding Presentation Award
September 2022, awarded by Nagoya University.

### Vingroup Science and Technology Scholarship Nomination
August 2022, nominated by Vin University.

### Runner-up, National Computer Science Competition
2012, awarded by the Ministry of Education of Vietnam.

### First Prize, Municipal Mathematics Olympiad
2017, awarded by the Department of Education of the Municipal Government of Da Nang City, Vietnam.

### Third prize, Municipal Robotics Competition *ROBODNIC*
2017, awarded by the Association of the Science and Engineering Organisations in Da Nang City, Vietnam.

## Licenses / Qualifications

**Stanford University** – Specialisation in Machine Learning
Credential ID: JV2NK7M6HMSN

**Amazon Web Services** – Specialisation in Cloud-based Application Development on AWS
Credential ID: YWFXB8CS6DTJ

## Skills

Languages
**English** (advanced – IELTS 8.0), **Japanese** (fluent – JLPT N2), **Vietnamese** (native)

Programming, Electrical engineering, Autonomous driving systems development, and others
**Data science** and **AI implementation** in Python, **Cloud-based** and **containerised** application development, **Graphics engine** (Unreal Engine) programming, **3D CAD**, **Autonomous driving simulators** (CARLA, SVL, Autoware), **Electronics circuit** design and implementation.

## Research & Academic Experience

Autonomous driving vehicle research, Automotive perception

**Multispectral and multimodal data capturing system with multiple LiDAR sensors, 360°-surround visual imaging system, and 360°-surround thermal imaging system**

Roles:

- Design the system, using 3D CAD and mechanical structural strength simulator, to ensure sufficient mechanical strength and optimised field of view for every sensor.
- Design and construct the sensors calibration mechanism.
- Design, construct, and program the Raspberry Pi-based electronics circuit for sensors synchronisation using electrical signal protocol and ethernet communication protocol.
- Design and construct a support system for equipment placement inside the data-capturing vehicle.
- Assemble the system, install the sensors, and mount the system on top of the data-capturing vehicle.

Project at Nagoya University, NEDO, and JARI, December 2021 – Present.

Autonomous driving vehicle research, Simulation environment creation from reality (real-to-sim)

**Digital twin reconstruction with materials segmentation using 3D mapping, sensors fusion, and learning from multispectral and multimodal perception data**

Master's research project component, Takeda Lab, Nagoya University, February 2022 – Present.

Research project at R-CCS (RIKEN Centre for Computational Science)

**Implementation of the LETKFCC (Localised Ensemble Transform Kalman Filter with Cross Correlation) and analysis of the cross-correlated observation and forecast error's influence on the assimilation accuracy**

Research project conducted in the Data Assimilation Research Group at R-CCS during the High-Performance Computing (HPC) Computational Science Research Internship, September 2022

Unreal Engine usage, C++ programming

**Implementation of a simulated 3D LiDAR sensor in Unreal Engine 4 with customisable parameterisation to accurately simulate any real-world LiDAR sensor.**

Implementation of such module in Unreal Engine 4 using the UE4's C++ API with comprehensive parameterisation and Physics factors such as atmospheric attenuation and BRDF scattering coefficients based on different materials and incident angles. Takeda Lab, Nagoya University, October 2021 – January 2022.

Undergraduate research, Computer simulation

**Monte Carlo simulation algorithm for LiDAR signal based on Physics and Optics**

Bachelor's research project under supervision of Prof. A. Carballo and Prof. K. Takeda, Graduate School of Informatics and Institutes of Innovation for Future Society, Nagoya University, Autumn 2020 – Autumn 2021.

Mathematics research

**Mathematics research project on radial Schrödinger operators with a Coulomb potential and Whittaker equations**

Project contributor under supervision of Prof. S. Richard, Graduate School of Mathematics, Nagoya University, Autumn 2018 – Spring 2020

Programming, MATLAB

**Numerical analysis and computational simulation of the chaotic motion of a double pendulum using Runge-Kutta method for a temporally discrete non-linear system of simultaneous equations**

Midterm project, course: Numerical Analysis, Autumn 2019, Nagoya University

Robotics, Leadership

**Captain of robotics team "LQD-INVENTORS" in ROBODNIC competition**

2017 – Da Nang City, Vietnam

Roles: Overall management; Robot structure, electrical system, and pneumatic system design and construction; Strategies planning.

Outcome: Third prize overall, recognised for the uniqueness and creativity of robot design idea.

## Teaching Experience

10/2018 – 2/2021

**Tutor** for the following courses at Nagoya University:

Mathematics for Machine Learning (Autumn 2020)
Graph Theory (Spring 2020)
Calculus I (Autumn 2019)
Differential Geometry (Autumn 2018)