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Duc-Cuong VU, BSc.

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Education

Master of Science in Automation and Control (*Jul 2024 - present*)

School of Electrical - Electronics Engineering, Hanoi University of Science and Technology (HUST),

Hanoi, Vietnam

- **Research project:** *Design control structures for Parallel Platforms in Maritime applications*
- **Funded by:** *Master, PhD Scholarship Programme of Vingroup Innovation Foundation (VinIF)*

Bachelor of Science in Automation and Control (*Oct 2020 - Mar 2024*)

School of Electrical - Electronics Engineering, Hanoi University of Science and Technology (HUST),

Hanoi, Vietnam

- **Excellent degree**, GPA: 3.71/4. Finished the 4-year BSc program in **just 3.5 years**.
- **Ranking:** 22/499 in the same cohort.
- **Bachelor Thesis:** *Balancing, motion planning, and tracking control for ballbot systems* [pdf] .
  Thesis score: 9.9/10 - The best thesis defense

Work experience

Research Assistant (*Oct 2021 - present*)

The Mechatronics Engineering Group, Hanoi University of Science and Technology (HUST),

Hanoi, Vietnam

- **Research topics:** Automation, Control Design, Robotics, Multi-agent Systems, Modeling and Simulation, Experiment systems.
- **Supervisor:** *Assoc.Prof.PhD. Tung Lam Nguyen* (lam.nguyentung[at] hust.edu.com)
- **Skills acquired:** hardware design, numerical simulation and modeling, analysis, and interpretation of results, study conception, and design, draft manuscript preparation, ...

Projects

Member/Researcher (*Mar 2025 - Dec 2025*)

Advanced Control of a Ship-Mounted Stewart Platform for Marine Applications

- Field: Marine Robotics and Control Systems.
- International Collaboration of Korea Institute of Science and Technology and Institute (KIST) for Control Engineering and Automation (HUST) via the *KIST School Partnership Project*.
- Responsible for designing the Stewart platform control system and validating it through experiments.
- Supervisors: *PhD. Minh Nhat Vu* (PI) and *Assoc.Prof.PhD. Tung Lam Nguyen*

Member/Researcher (*Jan 2025 - Dec 2027*)

Robot navigation system integrating sensor network and wireless communication

- Field: Communications, Optimization, Robotics, and Control Systems.
- Funded by Hanoi University of Science and Technology (HUST).
- Responsible for developing the AUV simulation in MuJoCo and validating control algorithms through quasi-physics-based tests.
- Supervisors: *PhD. Chinh Hoang Duc* (PI) and *Assoc.Prof.PhD. Tung Lam Nguyen*.

Selected publications

Journal Ocean Engineering (SCIE Q1) (2025)

Lagrangian-based modeling and safety-critical controls for Stewart platforms under marine operations

Duc Cuong Vu, Danh Huy Nguyen, Minh Nhat Vu, and Tung Lam Nguyen

DOI: 10.1016/j.oceaneng.2025.122142

Journal IEEE Acess (SCIE Q2) (2025)

CBFs-based Model Predictive Control for Obstacle Avoidance with Tilt Angle Limitation for Ball-Balancing Robots

Minh Duc Pham, Duc Cuong Vu, Thi Thuy Hang Nguyen, Thi Van Anh Nguyen, Minh Nhat Vu, and Tung Lam Nguyen

DOI: 10.1109/ACCESS.2025.3567474

Journal Results in Engineering (ESCI Q1) (2025)

A novel approach of Consensus-based Finite-time Distributed Sliding Mode Control for Stewart platform manipulators motion tracking

Duc Cuong Vu, Danh Huy Nguyen, and Tung Lam Nguyen

DOI: 10.1016/j.rineng.2024.103872

Journal International Journal of Robust and Nonlinear Control (SCIE Q1) (2024)

Time-optimal trajectory generation and observer-based hierarchical sliding mode control for ballbots with system constraints

Duc Cuong Vu, Minh Duc Pham, Thi Thuy Hang Nguyen, Thi Van Anh Nguyen, and Tung Lam Nguyen

DOI: 10.1002/rnc.7358

Academic activities

Invited review for

Nonlinear Dynamics (*this is my first time as a reviewer*)

Seminars and Talks

2025: Talk "MuJoCo for Advanced Physics Simulation: From manipulators to autonomous vehicles" for "Motion Control" master course at HUST and MoCAR seminar [pdf]

2025: Seminar "Underwater Vehicles" for modeling training of Autonomous Underwarter Vehicle at MEG-MoCAR [pdf]

Conferences

IEEE 12th International Conference on Control, Automation and Information Sciences (IEEE ICCAIS 2023)

Hanoi, Vietnam

2024 International Conference on Advanced Technologies for Communications (IEEE ATC2024)

Ho Chi Minh City, Vietnam

International Conference on Intelligent Systems and Networks (Springer ICISN 2023)

Hanoi, Vietnam

Honours & awards

Master, PhD Scholarship Programme

Vingroup Innovation Foundation (VINIF)

Best Thesis Defense Award

Hanoi University of Science and Technology

Skills

Programming	Proficient in Python, C/C++, and MATLAB for algorithm development, numerical computation, and embedded system applications.
Simulation	Experienced with Simulink, Simscape, and MuJoCo for multi-domain physical modeling, robot dynamics simulation, and virtual prototyping.
Control & Math	Solid foundation in rigid body dynamics, control theories, motion control, optimization, and Guidance–Navigation–Control (GNC) systems.
Engineering	Hands-on experience with version control (Git), PCB design and debugging, 3D CAD modeling using SolidWorks, and designing experimental platforms for validation.
Systems	Familiar with EtherCAT-based Linux kernel development, real-time control architectures, and embedded systems programming for robotics and automation.
Research	Capable of conducting scientific research, writing academic publications, and presenting technical findings at international conferences. Experienced in literature review, hypothesis formulation, and experimental validation.