Duc-Cuong VU, BSc.

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Education

Master of Science in Automation and Control, *Hanoi University of Science and Technology (HUST)*, *Jul 24 - present*

- **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, *Hanoi University of Science and Technology (HUST)*, *Oct 20 - Mar 24*

- **Excellent degree**, GPA: 3.71/4 (Rank: 22/499). Finished the 4-year BSc program in **just 3.5 years**.
- **Thesis:** *Balancing, motion planning, and tracking control for ballbot systems* [pdf] (The best thesis defense)

Selected publications

Journal Ocean Engineering (SCIE Q1) (2025)

Glocal trajectory generation and tracking control for AUVs with optimal coverage sensor networks [pdf]

Duc Cuong Vu*, *Son Tran**, *Tung Lam Nguyen, and Duc Chinh Hoang*

Journal Ocean Engineering (SCIE Q1) (2025)

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

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

Journal IEEE Acess (SCIE Q2) (2025)

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

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

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 [pdf]

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

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 [pdf]

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

Work experience

VinRobotics *Sep 2025 - present*

Robotics Engineer *Hanoi, Vietnam*

- Responsible for System Identification, State Estimation, Model Predictive Control (MPC), and Whole Body Control (WBC) for VinRobotics Humanoids robot.

Mechatronics Engineering Group at HUST *Oct 2021 - present*

Research Assistant supervised by Assoc.Prof.PhD. Tung Lam Nguyen, *Hanoi, Vietnam*

- Conducted research on advanced control strategies, robotics, motion control, and multi-agent systems, focusing on both theoretical development and practical implementation.

Academic projects

Advanced Control of a Ship-Mounted Stewart Platform for Marine Applications *Mar 2025 - Dec 2025*

Research assistant supervised by PhD. Minh Nhat Vu (PI) and Assoc.Prof.PhD. Tung Lam Nguyen

- 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*.
- Designed and implemented advanced control algorithms for a Stewart platform in marine environments, supported by high-fidelity simulations (Simscape, MuJoCo) and validated through a full experimental setup (mechanical assembly, hardware integration, Linux real-time kernel, EtherCAT communication).
- Collaborated with cross-institutional teams on system integration, troubleshooting, and documentation, while authoring peer-reviewed publications (Ocean Engineering, Results in Engineering) and presenting outcomes to academic and industrial partners.

Robot navigation system integrating sensor network and wireless communication *Jan 2025 - Dec 2027*

Research assistant supervised by PhD. Chinh Hoang Duc (PI) and Assoc.Prof.PhD. Tung Lam Nguyen.

- Field: Communications, Optimization, Robotics, and Control Systems.
- Funded by Hanoi University of Science and Technology (HUST).
- Designed and developed a comprehensive MuJoCo-based simulation environment for AUVs, incorporating underwater dynamics, sensor feedback, environmental disturbances, and communication constraints to evaluate system performance.
- Implemented and validated advanced control algorithms for navigation, obstacle avoidance, and trajectory tracking, while collaborating on integration, troubleshooting, and authoring a peer-reviewed scientific paper.

Balancing, motion planning, and tracking control for ballbot systems *Jul 2023 - Jul 2024*

Bachelor graduated project supervised by Assoc.Prof.PhD. Tung Lam Nguyen

- Field: Optimization, Robotics, and Control Systems.
- Developed mathematical models, simulation environments, advanced control and trajectory planning methods for ballbot navigation, including observer-based hierarchical sliding mode control, NMPC with control barrier functions (CBFs), and flatness-based time-optimal motion planning, with outcomes published in the International Journal of Robust and Nonlinear Control (RNC) and IEEE Access.

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]

Honours & awards

Master, PhD Scholarship Programme

Vingroup Innovation Foundation (VINIF)

Best Thesis Defense Award

Hanoi University of Science and Technology

Skills

Programming	Python, C/C++, MATLAB for algorithms and embedded applications.
Simulation	Simulink, Simscape, MuJoCo for modeling and dynamics.
Control & Math	Rigid body dynamics, motion control, optimization, GNC.
Engineering	Git, PCB design, SolidWorks, experimental platforms.
Systems	Real-time Linux, EtherCAT, embedded robotics/automation.
Research	Publications, presentations, literature review, validation.