Duy-Nam Bui

Multi-agent Systems, Networked Systems, Control Theory, Path Planning, Reinforcement Learning

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Education

Vietnam National University — **Hanoi, Vietnam**
Master of Science in Electronics Engineering — *Oct. 2022 – Dec. 2024*

- CGPA: 3.70/4.0 (Top 5%).
- Thesis title: Distributed Control strategies for Changing Multiple UAV Formation.
- Results: Distributed Formation Reconfiguration Control

Vietnam National University — **Hanoi, Vietnam**
Bachelor of Engineering in Robotics Engineering — *Aug. 2018 – Jun. 2022*

- CGPA: 3.81/4.0 (Top 1%).
- Thesis title: Lyapunov-based Nonlinear Model Predictive Control for Trajectory tracking and Navigation of a Four wheeled omni-directional Mobile Robot.
- Results: Mobile Robot Navigation using NMPC

Professional Skills

– **Academical Knowledge**: Robotics, Autonomous Systems, Multi-Agent Systems, Control Theory, Optimal Control, Path Planning, Motion Planning, Intelligent Algorithms, Reinforcement Learning

– **Programming Languages**: C/C++, Python, Matlab

– **Tools**: ROS, Ubuntu, Gazebo, Git, Latex, Fusion 360, 3D Printing, Embedded Systems

Work Experiences

VinAI Research — **Hanoi, Vietnam**
Automotive Embedded Engineer at Smart Mobility Division, full-time — *Oct. 2023 – Present*

– **Parking Solutions**: Algorithms developed and system integrated into car to assist drivers in parking process.

+ **Fully Automatic Parking Assist** *(Smart Parking Innovation of the Year – Autotech Breakthrough Award 2024)*
+ **Reverse Autonomous Emergency Braking**
+ **Home-zone Park Assist**

- Developed optimal controller, with focus on Model Predictive Control solution.
- Developed and integrated motion planning modules (A*, JPS, Hybrid A*).
- Developed and enhanced the smooth movement of low-level controller.
- Developed safety control and surrounding collision warning functions in parking process.

Rikkeisoft — **Hanoi, Vietnam**
Robotics Engineer at Rikkei AI Division, full-time — *Jul. 2022 – Aug. 2023*

– **Indoor Service Robot**: System integrated into assistance robot for home applications

- Developed a ROS-based automated navigation system.
- Developed and integrated an autonomous exploration, focus on frontier-based method.
- Designed and developed software architecture to integrate AI model into robot.
- Designed 3D structures for a mobile robot.

Vietnam National University — **Hanoi, Vietnam**
Research Study Assistant at Faculty of Electronics and Telecommunications — *Sep. 2018 – Dec. 2024*

- Studied of control and navigation modules for an autonomous mobile robot.
- Studied on multi-robot system and UAVs, focusing on cooperative control and path planning.

AWARDS

Excellent Employee 2024 of VinAI Research	2025
Best Paper Award in 7th International Conference on Control, Robotics and Informatics	2024
Master Scholarship of Vingroup Innovation Foundation (VINIF)	2023, 2024
Valedictorian of Robotics Engineering, Vietnam National University, Hanoi	2022
Best Under-graduation Thesis Award in Robotics Examination Committee	2022

PUBLICATIONS

Journal

- Duy-Nam Bui, Manh Duong Phung and Hung Pham Duy. **Event-based Reconfiguration Control for Time-varying Formation of Robot Swarms in Narrow Spaces**, *Intelligent Service Robotics*, pp. 1–13, May 2025.
- Thu Hang Khuat, Duy-Nam Bui, Hoa TT. Nguyen, Mien L. Trinh, Minh T. Nguyen and Manh Duong Phung. **Multi-goal Rapidly Exploring Random Tree with Safety and Dynamic Constraints for UAV Cooperative Path Planning**, *IEEE Transactions on Vehicular Technology*, pp. 1–12, April 2025.
- Thuy Ngan Duong, Duy-Nam Bui and Manh Duong Phung. **Navigation Variable-based Multi-objective Particle Swarm Optimization for UAV Path Planning with Kinematic Constraints**, *Neural Computing and Applications*, vol. 37, pp. 5683–5697, January 2025.
- Duy-Nam Bui and Manh Duong Phung. **Radial basis function neural networks for formation control of unmanned aerial vehicles**, *Robotica*, vol. 42, pp. 1842–1860, June 2024.
- Duy-Nam Bui, Thi Thanh Van Nguyen, and Manh Duong Phung. **Lyapunov-based nonlinear model predictive control for attitude trajectory tracking of unmanned aerial vehicles**, *International Journal of Aeronautical and Space Sciences*, vol. 24, pp. 502–513, April 2023.
- Manh Cuong Nguyen, Nhu Toan Nguyen, Duy-Nam Bui, and Tung Lam Nguyen. **Adaptive fuzzy lyapunov-based model predictive control for parallel platform driving simulators**, *Transactions of the Institute of Measurement and Control*, vol. 45, pp. 838–852, September 2022.

Conference

- Duy-Nam Bui, Thu Hang Khuat, Manh Duong Phung, Thuan Hoang Tran, Dong LT Tran. **Model Predictive Control for Optimal Motion Planning of Unmanned Aerial Vehicles**, In *7th International Conference on Control, Robotics and Informatics (ICCRI)*, pp. 1–6, 2024.
- Duy-Nam Bui, Thuy Ngan Duong, and Manh Duong Phung. **Ant colony optimization for cooperative inspection path planning using multiple unmanned aerial vehicles**, In *IEEE/SICE International Symposium on System Integration (SII)*, pp. 675–680, 2024.
- Duy-Nam Bui, Manh Duong Phung, and Hung Pham Duy. **Self-reconfigurable V-shape formation of multiple UAVs in narrow space environments**, In *IEEE/SICE International Symposium on System Integration (SII)*, pp. 1006–1011, 2024.
- Thuy Ngan Duong, Duy-Nam Bui, Manh Duong Phung, and Duy Hung Pham. **Deployment of UAVs for optimal multihop ad-hoc networks using particle swarm optimization and behavior-based control**, In *11th International Conference on Control, Automation and Information Sciences (ICCAIS)*, pp. 304–309, 2022.
- Hoang-Anh Phan, Duy-Nam Bui, Tuan Nguyen Dinh, Bao-Anh Hoang, An Nguyen Ngoc, Dong Tran Huu Quoc, Ha Tran Thi Thuy, Tung Thanh Bui, and Van Nguyen Thi Thanh. **Development of a Vision System to Enhance the Reliability of the Pick-and-Place Robot for Autonomous Testing of Camera Module used in Smartphones**, In *International Conference on Engineering and Emerging Technologies (ICEET)*, pp. 1–6, 2021.

ACADEMIC SERVICES

Reviewer

- IEEE Transactions on Automation Science and Engineering
- IEEE Transactions on Aerospace and Electronic Systems
- Neural Computing and Applications

- Intelligent Service Robotics
- Swarm and Evolutionary Computation
- ISA Transactions

REFEREES

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Vietnam National University, Hanoi, Vietnam hungpd@vnu.edu.vn

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Fulbright University Vietnam, Ho Chi Minh City, Vietnam duong.phung@fulbright.edu.vn