Pham Minh Duc

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Education

Hanoi University of Science and Technology (HUST) *10/2020 - 8/2024*
***Excellent Bachelor's Degree** in **Talented Program** of Control Engineering and Automation*
CPA: 3.8/4.0

Academic Experience

- **Motion Control and Applied Robotics Laboratory (MoCAR)** *11/2021 - present*
  University: ***Hanoi University of Science and Technology, Vietnam***
  Research orientation: ***Advanced controls for ballbot system***
- **TEEP Internship in Computational Intelligence and Robotics Lab (CIR)** *2/2025 - 6/2025*
  University: ***National Taiwan Normal University, Taiwan***
  Research orientation: ***Robot navigation system using deep reinforcement learning***

Research Publications

- **M. D. Pham**, D. C. Vu, T. T. H. Nguyen, T. V. A. Nguyen, and T. L. Nguyen, "CBFs-based Model Predictive Control for obstacles avoidance with tilt angle limitation for ball-balancing robots," *IEEE Access*, 2025.doi: 10.1109/ACCESS.2025.3567474
- D. C. Vu, **M. D. Pham**, T. T. H. Nguyen, T. V. A. Nguyen, and T. L. Nguyen, "Time-optimal trajectory generation and observer-based hierarchical sliding mode control for ballbots with system constraints," *International Journal of Robust and Nonlinear Control*, 2024. doi: 10.1002/rnc.7358
- **M. D. Pham**, C. M. Pham, P. T. Dao, T. G. Do, N. M. Nguyen, V. T. Dang, T. L. Nguyen, "A Fast Terminal Fractional-order Backstepping Sliding Mode Control for Ball-Balancing Robots," *International Journal of Industrial and Systems Engineering*, 2024. doi: 10.1504/IJISE.2024.10067272 (Entering Publication Schedule)
- **Pham Minh Duc**, Vu Duc Cuong, Nguyen Thi Thuy Hang, Nguyen Danh Huy, Nguyen Thi Van Anh, Nguyen Tung Lam, "Dynamic Obstacle Avoidance Using Nonlinear Model Predictive Control and Control Barrier Function for Ballbot Systems," *Journal of Science and Technology: Smart Systems and Devices*, Hanoi University of Science and Technology, 2024, pp. 35-42. doi: 10.51316/jst.176.ssad.2024.34.3.5
- **M. D. Pham**, D. C. Vu, T. T. H. Nguyen, T. -V. -A. Nguyen, H. B. Dang and T. L. Nguyen, "Adaptive Mechanism Hierarchical Sliding Mode Control for Ballbot Systems," *2024 International Conference on Advanced Technologies for Communications (ATC)*, Ho Chi Minh City, Vietnam, 2024, pp. 797-802. doi: 10.1109/ATC63255.2024.10908289
- **M. D. Pham**, D. C. Vu, T. T. H. Nguyen, T. -V. -A. Nguyen, D. D. Vu and T. L. Nguyen, "Nonlinear Model Predictive Control for Ballbot systems: A benchmark with Hierarchical Sliding Mode and Linear Quadratic controls," *2023 12th International Conference on Control, Automation and Information Sciences (ICCAIS)*, Hanoi, Vietnam, 2023, pp. 411-416. doi: 10.1109/ICCAIS59597.2023.10382349
- **M. D. Pham**, C. M. Pham, T. G. Do, P. T. Dao, T. D. Van, Q. D. Hoang, and T. L. Nguyen, "Auto-balancing ballbot systems: A fractional- order sliding mode based radial-basis neural network approach," in *Advances in Engineering Research and Application: Proceedings of the International Conference on Engineering Research and Applications, ICERA 2022*. Springer, 2022, pp. 270–280. doi: 10.1007/978-3-031-22200-9_29

Achievements

- **Second Prize at Science and Technology Award for Students in Higher Education Institutions organized by Vietnamese Ministry of Education and Training** *11/2024*
- **Highest score in Bachelor Defense of Control Engineering and Automation** *7/2024*
- **First prize of the 41st HUST Conference of Student Scientific Research** *5/2024*
- **Three times received HUST Academic Incentive Scholarship for excellent students** *2022-2024*
- **Salutatorian in Entrance for Talent Program of Control Engineering and Automation** *10/2020*

Extracurricular Activities

- **Presenter in National conference on Smart technologies and application for Industry 4.0, Smart city and Sustainability (STAIS)** *10/2023*
- **Second Prize in the ASEAN i-Teams programme for commercialization of new technologies emerging from university research** *Summer 2023*

Related Skills

- **Languages**: English - IELTS 7.0
- **Working with Programming**(MATLAB, Python, C++)/**Simulation**(MATLAB-Simulink, ROS2, LabVIEW) /**Hardware/Real Systems in Robotics and Control Engineering**
- **Reviewing and analyzing scientific articles**
- **Researching and team-working with foreign partners**

References

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Prof. Chen-Chien James Hsu
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