Viet-Anh Le

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Research Interest

- Model Predictive Control
- Learning for Dynamics and Control
- Distributed Optimization
- Multi-Agent Systems
- Human-Autonomy Interaction
- Connected and Automated Vehicles

Education

University of Delaware — Newark, DE USA
Ph.D. in Mechanical Engineering — Aug. 2021–Present
Advisor: Dr. Andreas Malikopoulos, Professor, School of Civil and Environmental Engineering, Cornell University

Northern Arizona University — Flagstaff, AZ USA
M.Sc. in Informatics (with Distinction) — Aug. 2019–May 2021
Advisor: Dr. Truong X. Nghiem, Assistant Professor, School of Informatics, Computing, and Cyber Systems

Hanoi University of Science and Technology — Hanoi, Vietnam
B.Sc. in Control Engineering and Automation (Talented Program[1]) — Aug. 2014–Jun. 2019

Professional Experience

Cornell University — Ithaca, NY USA
Visiting (Non-degree) Graduate Student in System Engineering — Aug. 2023–Present

- Development of IDS's Scaled Smart City (Version 2.0 at Cornell University)

University of Delaware — Newark, DE USA
Graduate Research Assistant at Information and Decision Science Laboratory — Aug. 2021–Present

- Learning and Control for Connected and Automated Vehicles in Mixed Traffic

Honda Research Institute — Ann Arbor, MI USA
Graduate Student Intern — Jun. 2023–Aug. 2023

- Social Navigation for Multiple Robots in Crowded Environments

University of Delaware — Newark, DE USA
Graduate Teaching Assistant at Department of Mechanical Engineering — Aug. 2021–May 2022

- Vibration and Control (Lab) - MEEG 312 - Fall 2021
- Dynamics - MEEG 211 - Spring 2022

Northern Arizona University — Flagstaff, AZ USA
Graduate Research Assistant at Intelligent Control System Laboratory — Aug. 2019–May. 2021

- Learning-Based Model Predictive Control with Gaussian Processes
- Adaptive Sampling for Mobile Robotic Sensor Networks

Vietnam Maritime University — Haiphong, Vietnam
Undergraduate Research Intern at School of Mechanical Engineering — Sep. 2017–Mar. 2019

- Applications of Modern Control Theory in Designing Digital Controllers for Crane Systems
- Research, Design, and Manufacture of a Floating Crane Testbed in the Laboratory

[1] An undergraduate program for approximately top 100 students in five majors

Publications

Journal Articles

[1] A. I. Mahbub, **V.-A. Le**, and A. A. Malikopoulos, "A safety-prioritized receding horizon control framework for platoon formation in a mixed traffic environment", *Automatica*, vol. 155, p. 111 115, 2023.

[2] **V.-A. Le**, L. Nguyen, and T. X. Nghiem, "Multistep Predictions for Adaptive Sampling in Mobile Robotic Sensor Networks Using Proximal ADMM", *IEEE Access*, vol. 10, pp. 64 850–64 861, 2022.

[3] **V.-A. Le**, L. Nguyen, and T. X. Nghiem, "ADMM-Based Adaptive Sampling Strategy for Nonholonomic Mobile Robotic Sensor Networks", *IEEE Sensors Journal*, vol. 21, no. 13, pp. 15 369–15 378, 2021.

[4] **V.-A. Le**, X. H. Le, L. Nguyen, and X. M. Phan, "An efficient adaptive hierarchical sliding mode control strategy using neural networks for 3D overhead cranes", *International Journal of Automation and Computing*, vol. 16, no. 5, pp. 614–627, 2019.

[5] A. T. Le, M. C. Hoang, V. T. Pham, C. N. Luong, D. T. Vu, and **V.-A. Le**, "Adaptive neural network sliding mode control of shipboard container cranes considering actuator backlash", *Mechanical Systems and Signal Processing*, vol. 112, pp. 233–250, 2018.

Conference Papers

[1] **V.-A. Le**, B. Chalaki, V. Tadiparthi, H. N. Mahjoub, J. D'sa, E. Moradi-Pari, and A. A. Malikopoulos, "Multi-Robot Cooperative Navigation in Crowds: A Game-Theoretic Learning-Based Model Predictive Control Approach", in *2024 IEEE International Conference on Robotics and Automation (ICRA)*, (accepted, arXiv preprint arXiv:2310.06964).

[2] **V.-A. Le**, H. M. Wang, G. Orosz, and A. A. Malikopoulos, "Coordination for Connected Automated Vehicles at Merging Roadways in Mixed Traffic Environment", in *2023 62th IEEE Conference on Decision and Control (CDC)*, 2023, pp. 4150–4155.

[3] N. Venkatesh, **V.-A. Le**, A. Dave, and A. A. Malikopoulos, "Connected and Automated Vehicles in Mixed-Traffic: Learning Human Driver Behavior for Effective On-Ramp Merging", in *2023 62th IEEE Conference on Decision and Control (CDC)*, 2023, pp. 92–97.

[4] **V.-A. Le** and A. A. Malikopoulos, "Optimal Weight Adaptation of Model Predictive Control for Connected and Automated Vehicles in Mixed Traffic with Bayesian Optimization", in *2023 American Control Conference (ACC)*, 2023, pp. 1183–1188.

[5] **V.-A. Le** and A. A. Malikopoulos, "A Cooperative Optimal Control Framework for Connected and Automated Vehicles in Mixed Traffic Using Social Value Orientation", in *2022 61th IEEE Conference on Decision and Control (CDC)*, 2022, pp. 6272–6277.

[6] A. M. I. Mahbub, **V.-A. Le**, and A. A. Malikopoulos, "Safety-Aware and Data-Driven Predictive Control for Connected Automated Vehicles at a Mixed Traffic Signalized Intersection", in *10th IFAC International Symposium on Advances in Automotive Control*, IFAC, 2022, pp. 51–56.

[7] **V.-A. Le** and T. X. Nghiem, "Distributed Experiment Design and Control for Multi-agent Systems with Gaussian Processes", in *2021 60th IEEE Conference on Decision and Control (CDC)*, 2021, pp. 2226–2231.

[8] **V.-A. Le** and T. X. Nghiem, "A Receding Horizon Approach for Simultaneous Active Learning and Control using Gaussian Processes", in *2021 IEEE Conference on Control Technology and Applications (CCTA)*, IEEE, 2021, pp. 453–458.

[9] **V.-A. Le**, L. Nguyen, and T. X. Nghiem, "An Efficient Adaptive Sampling Approach for Mobile Robotic Sensor Networks using Proximal ADMM", in *2021 American Control Conference (ACC)*, IEEE, 2021, pp. 1101–1106.

[10] **V.-A. Le** and T. X. Nghiem, "Gaussian Process Based Distributed Model Predictive Control for Multi-agent Systems using Sequential Convex Programming and ADMM", in *2020 IEEE Conference on Control Technology and Applications (CCTA)*, IEEE, 2020, pp. 31–36.

[11] T. X. Nghiem, T.-D. Nguyen, and **V.-A. Le**, "Fast Gaussian Process based Model Predictive Control with Uncertainty Propagation", in *2019 57th Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, IEEE, 2019, pp. 1052–1059.

[12] **V.-A. Le**, X. H. Le, D. T. Vu, V. T. Pham, A. T. Le, and M. C. Hoang, "Designing an adaptive controller for 3D overhead cranes using hierarchical sliding mode and neural network", in *2018 International Conference on System Science and Engineering (ICSSE)*, IEEE, 2018, pp. 1–6.

Preprints

[1] **V.-A. Le**, B. Chalaki, F. N. Tzortzoglou, and A. A. Malikopoulos, "Stochastic Time-Optimal Trajectory Planning for Connected and Automated Vehicles in Mixed-Traffic Merging Scenarios", (arXiv preprint arXiv:2311.00126).

[2] **V.-A. Le**, B. Chalaki, V. Tadiparthi, H. N. Mahjoub, J. D'sa, and E. Moradi-Pari, "Social Navigation in Crowded Environments with Model Predictive Control and Deep Learning-Based Human Trajectory Prediction", (arXiv preprint arXiv:2309.16838).

[3] I. V. Chremos, H. Bang, A. Dave, **V.-A. Le**, and A. A. Malikopoulos, "Modeling Travel Behavior in Mobility Systems with an Atomic Routing Game and Prospect Theory", (arXiv preprint arXiv:2303.17790).

Fellowships and Awards

- Apr. 2022: Student Travel Awards by the University of Delaware's Graduate College and IEEE Control Systems Society for the 2022 American Control Conference
- Sep. 2021: Student Travel Award by IEEE Control Systems Society for the 2021 IEEE Conference on Decision and Control
- Jun. 2021: Student Travel Award by IEEE Control Systems Society for the 2021 IEEE Conference on Control Technology and Applications
- Aug. 2020: Student Travel Award by IEEE Control Systems Society for the 2020 IEEE Conference on Control Technology and Applications
- Aug. 2019: Northern Arizona University's Presidential Fellowship
- Aug. 2018: Odon Vallet's Scholarship (established by Prof. Odon Vallet from Sorbonne University) for undergraduate students
- Jun. 2018: Conference Travel Award by Vietnam's National Foundation for Science and Technology Development (NAFOSTED) for the 2018 IEEE International Conference on System Science and Engineering
- Apr. 2015: Gold Medal in the 2015 Vietnam's National Mathematical Olympiad for undergraduate students

Technical Skills

- *Programming languages*: Python, Julia, C/C++, MATLAB
- *Software/Tools*:
  - General: Git, LaTeX, Docker
  - Robotics/Control: Robot Operating Systems (ROS), Labview
  - Optimization/Optimal Control: CVXOPT, JuMP.jl, Yalmip, CasADi, acados
  - Machine Learning: PyTorch, OpenAI Gym, Flux.jl
  - Traffic Simulators: VISSIM.

Academic Activities

- *Membership*
  - Student Member, Institute of Electrical and Electronics Engineers (IEEE) 2020–Present
  - Student Member, IEEE Control System Society 2020–Present
  - Student Member, IEEE Intelligent Transportation Systems Society 2022–Present
  - Student Member, IEEE Robotics and Automation Society 2022–Present
  - Student Member, IEEE Computational Intelligence Society 2023–Present
  - Member, IEEE Technical Committee on Smart Cities 2022–Present
  - Member, IEEE Technical Committee on Human-Robot Interaction & Coordination 2023–Present

- *Reviewer*
  - Journals: Automatica, IEEE Transactions on Automatic Control, IEEE Transactions on Intelligent Transportation Systems, Transportation Research Part C: Emerging Technologies, IEEE/ASME Transactions on Mechatronics, IEEE Transactions on Robotics
  - Conferences: IEEE Conference on Control Theory and Applications, IEEE Conference on Decision and Control, American Control Conference, European Control Conference