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, Associate 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] **V.-A. Le** and A. A. Malikopoulos, "Distributed Optimization for Traffic Light Control and Connected Automated Vehicle Coordination in Mixed-Traffic Intersections", *IEEE Control Systems Letters*, (accepted, arXiv preprint arXiv:2409.10864).

[2] **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", *IEEE Transactions on Control Systems Technology*, 2024.

[3] A. Mokhtarian, P. Scheffe, M. Kloock, S. Schäfer, H. Bang, **V.-A. Le**, S. Sankaramangalam Ulhas, J. Betz, S. Wilson, S. Berman, A. Prorok, and B. Alrifaee, "A Survey on Small-Scale Testbeds for Connected and Automated Vehicles and Robot Swarms", *IEEE Robotics and Automation Magazine*, 2024.

[4] 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.

[5] **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.

[6] **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.

[7] **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.

[8] H. X. Le, T. V. Nguyen, **V.-A. Le**, T. A. Phan, N. H. Nguyen, and M. X. Phan, "Adaptive hierarchical sliding mode control using neural network for uncertain 2D overhead crane", *International Journal of Dynamics and Control*, vol. 7, pp. 996–1004, 2019.

[9] 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, and E. Moradi-Pari, "Social Navigation in Crowded Environments with Model Predictive Control and Deep Learning-Based Human Trajectory Prediction", in *2024 IEEE International Conference on Intelligent Robots and Systems (IROS)*, (accepted, arXiv preprint arXiv:2309.16838).

[2] **V.-A. Le**, V. Tadiparthi, B. Chalaki, 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)*, IEEE, 2024, pp. 4834–4840.

[3] **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.

[4] 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.

[5] **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.

[6] **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.

[7] 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.

[8] **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.

[9] **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.

[10] **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.

[11] **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.

[12] 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.

[13] **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** and A. A. Malikopoulos, "Controller Adaptation via Learning Solutions of Contextual Bayesian Optimization", (arXiv preprint arXiv:2403.04881).

Fellowships and Awards

- Aug. 2023: Student Travel Award by IEEE Control Systems Society for the 2023 IEEE Conference on Decision and Control
- 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, Gurobi
  - Machine Learning: PyTorch, Flux.jl
  - Traffic Simulators: VISSIM, SUMO

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
  - Member, IEEE-CSS Technical Committee on Smart Cities 2022–Present
  - Member, IEEE-CSS Technical Committee on Automotive Controls 2024–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, IEEE Control Systems Letters, Journal of the Franklin Institute, IEEE Transactions on Control Systems Technology, IEEE Transactions on Vehicular Technology, IEEE Transactions on Intelligent Vehicles
  - Conferences: IEEE Conference on Control Theory and Applications, IEEE Conference on Decision and Control, American Control Conference, European Control Conference, IEEE International Conference on Intelligent Transportation Systems, IEEE/RSJ International Conference on Intelligent Robots and Systems