

DANG VIET ANH NGUYEN

PhD Researcher at Technical University of Denmark

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EXPERIENCE

PhD Researcher in Machine Learning and Control
Technical University of Denmark (DTU)

2023 - Present, Copenhagen, Denmark

Developed T-REX, a scalable simulation environment for modeling and optimizing large-scale stochastic systems under disruptions, enabling controlled experimentation and policy evaluation in partially observed environments.

Designed GNN-MPC, a hybrid learning-optimization framework combining graph neural networks with model predictive control for closed-loop decision-making in multi-agent systems.

Built end-to-end pipelines integrating prediction, simulation, and planning, enabling robust decision-making under uncertainty and non-stationary dynamics.

Improved system robustness and scalability across large-scale scenarios under partial observability and dynamic disruptions.

Developed model-based policy learning algorithms (GNN-AlphaZero) for large-scale, real-time, multi-agent control problem under uncertainties.

Research Engineer in Intelligent Systems and Optimization
Singapore Management University (SMU)

2022 - 2023, Singapore

Designed hybrid frameworks combining reinforcement learning and combinatorial optimization for decision-making in stochastic systems under uncertainty.

Designed learning-based policies to guide search in high-dimensional optimization spaces, improving scalability and solution quality.

Achieved 24% performance improvement over state-of-the-art routing optimization methods on large benchmark and real-world logistics instances.

Validated approach on real-world logistics operations in Singapore, demonstrating improved routing efficiency and operational profit.

Implemented scalable optimization and training pipelines using Python and PyTorch.

Research Assistant - Transportation and Traffic Simulation Lab
Hanoi University of Civil Engineering (HUCE)

2020 - 2021, Hanoi, Vietnam

Developed statistical models to analyze large-scale behavioral datasets (n=676), identifying key drivers of system-level adoption dynamics.

Performed data analysis and modeling to support decision-making in transportation systems.

EDUCATION

Visiting Researcher at Chair of Transportation Systems Engineering
Technical University of Munich (TUM)

Mar - Sep 2026, Munich, Germany

PhD Researcher in Machine Learning and Control
Technical University of Denmark (DTU)

2023 - Present, Copenhagen, Denmark

Master of Science in Supply Chain and Logistics
Nanyang Technological University (NTU)

2021 - 2022, Singapore

SUMMARY

AI scientist specializing in learning and decision-making for complex physical systems under uncertainty. Designs simulation-driven optimization and multi-agent control systems integrating graph neural networks, reinforcement learning, and model predictive control. Experienced in building scalable, closed-loop decision systems that combine prediction, simulation, and optimization for real-world transportation and logistics applications.

PUBLICATIONS

GNN-AlphaZero: Model-Based Policy Iteration for Scalable Multi-Agent Traffic Signal Control
Working paper

Nguyen, D. V. A., Azevedo, C. L., Toledo, T., & Rodrigues, F.

Disruption-Aware Learning of Traffic Network Dynamics for Model Predictive Signal Control
Working paper

Nguyen, D. V. A., Azevedo, C. L., Toledo, T., & Rodrigues, F.

A Framework for Benchmarking Traffic Signal Control Robustness under Incidents: Comparative Study of Reinforcement Learning-Based Methods

Under review

URL: <https://arxiv.org/abs/2506.13836>

Nguyen, D. V. A., Azevedo, C. L., Toledo, T., & Rodrigues, F.

Hierarchical Forecast Reconciliation for Urban Rail Transit Demand Prediction under Operational Disruptions

Under review

URL: <https://arxiv.org/abs/2606.07044>

D. V. A. Nguyen, A. Fazlagic, K. P. Loft, F. Rodrigues

Deep reinforcement learning for solving the stochastic e-waste collection problem
European Journal of Operational Research

URL: <https://www.sciencedirect.com/science/article/abs/pii/S0377221725003182>

Nguyen, D. V. A., Gunawan, A., Misir, M., Hui, L. K., & Vansteenwegen, P. (2025).

Multi-Graph Inductive Representation Learning for Large-Scale Urban Rail Demand Prediction under Disruptions
Computers and Industrial Engineering

URL: <https://www.sciencedirect.com/science/article/pii/S0360835226001257?via%3Dihub>

Nguyen, D. V. A., Flensburg, J. V., Cerreto, F., Pascariu, B., Pellegrini, P., Azevedo, C. L., & Rodrigues, F.

ADDITIONAL PUBLICATIONS

Q-learning based framework for solving the stochastic e-waste collection problem

European Conference on Evolutionary Computation in Combinatorial Optimization (EvoCOP)

URL: https://link.springer.com/chapter/10.1007/978-3-031-57712-3_4

Nguyen, D. V. A., Gunawan, A., Misir, M., & Vansteenwegen

GRASP solution approach for the e-waste collection problem

International Conference on Computational Logistics

URL: https://link.springer.com/chapter/10.1007/978-3-031-43612-3_16

Gunawan, A., Nguyen, D. V. A., Nguyen, P. K. M., & Vansteenwegen, P.

The heterogeneous vehicle routing problem with multiple time windows for the e-waste collection problem

IEEE Conference on Automation Science and Engineering (CASE)

URL: <https://ieeexplore.ieee.org/document/10260477>

Gunawan, A., Nguyen, M. P. K., Vincent, F. Y., & Nguyen, D. V. A.

RESEARCH INTEREST

AI for Complex Physical Systems

Learning and control in large-scale, stochastic environments with partial observability

Simulation-Augmented Learning

Integration of simulators with reinforcement learning for decision-making

Multi-Agent Systems & Coordination

Scalable control and planning in decentralized, interacting systems

Learning-Guided Optimization

Combining ML with combinatorial and continuous optimization

SKILLS

Programming: Python, Pytorch, Pytorch Geometric, Numpy, Scipy, Pandas, Scikit-learn, Jax, Matlab, Julia

Optimization and Systems: Gurobi, CPLEX, OR Tools, CUDA, Parallel Computing, Git, HPC/SLURM clusters, Linux, SUMO/Traci, NetworkX

PROFESSIONAL MEMBERSHIP

IEEE Robotics and Automation Society (IEEE-RAS)

IEEE Control Systems Society (IEEE-CSS)

IEEE Intelligent Transportation Systems Society (IEEE-ITSS)

European Complex Systems Society (ECSS)

INFORMS – The Institute for Operations Research and the Management Sciences

SIAM – Society for Industrial and Applied Mathematics

ACM – Association for Computing Machinery

PROJECT

ProLight -

Proactive AI for Intelligent Traffic Control

10/2023 - 12/2026, Denmark

URL: <https://ai-prolight.eu/>

DFF-funded project focused on developing advanced large-scale multi-agent decision systems in real-world infrastructure integrating learning, simulation, and optimization for decision-making under uncertainty.

E-waste must never be wasted: Vehicle Route Planning Optimization for E-Waste Collection

01/2022 - 12/2023, Singapore

Research Engineer in Intelligent Systems, creating hybrid optimization with Reinforcement Learning for Singapore's e-waste collection.

Two-echelon Vehicle Routing Problem for Post-disaster Aid

01/2021 - 12/2022, Singapore

Master's thesis addressing the challenges of vehicle routing in post-disaster scenarios.

CONSULTING EXPERIENCE

Consultant - Outsmart Insight

04/2026 - Present, London, UK

Serve as a consulting associate on selected research and development (R&D) projects.

Provide analytical and technical support for innovation-driven initiatives across industry and academia.

Contribute expertise in AI, machine learning, optimization, and data-driven decision-making.

Evaluator for ELLIS PhD Program

European Laboratory for Learning and Intelligent Systems

ACADEMIC SERVICE

Reviewer for scientific conferences

The Conference on Neural Information Processing Systems (NeurIPS) - 2025, 2026

Transportation Research Board (TRB) Annual Meeting

The International Conference on Optimization, Modeling, Simulation, and Analytics - 2025

TRC-30: 30th Anniversary of Transportation Research Part C - 2024

Symposium of the European Association for Research in Transportation (hEART) - 2024

Reviewer for Academic Journals

Transportation Research Part C: Emerging Technologies (TRC)

Transportation Research Part E: Logistics and Transportation Review (TRE)

European Journal of Operational Research (EJOR)

Engineering Applications of Artificial Intelligence (EAAI)

Neurocomputing (NEUCOM)

Artificial Intelligence for Transportation (AIT)