HOANG DINH Thinh

Ph.D Student, École Nationale de l'Aviation Civile
Optimization and Machine Learning Laboratory

Email : hdinhthinh@gmail.com
Mobile : +33 7 75 23 46 66
LinkedIn Profile

EDUCATION

- **Artificial and Natural Intelligence Toulouse Institute (ANITI)** — Toulouse, France
  PhD Candidate in Applied Mathematics affiliated with Paul Sabatier University. — *Sep 2020 - Nov 2023 (expected)*

  Thesis title: Collective Perception, optimization of the V2X frequency channel(s) usage and CP message contents based on A.I.

  Advisers: Pr. Daniel DELAHAYE (French Civil Aviation University), Pr. Pierre MARÉCHAL (Toulouse Institute of Mathematics) and Vincent MARTINEZ (NXP Semiconductors).

  In this project, various methods to design a more efficient communication scheme between vehicles were studied. The project comprises the derivation of an online anomaly detection algorithm, data clustering, dimensionality reduction and other unsupervised learning methods. Probability and stochastic processes were also central to proving performance guarantees.

- **Ho Chi Minh City University of Technology (HCMUT)** — Ho Chi Minh City, Vietnam
  Engineering Degree in Aerospace Engineering, PFIEV Program. — *2013-2018*

HONORS

- **Fellowship for PhD Study at ANITI** — 2020
  ANITI — *Toulouse, France*
- **Fellowship for PhD Study at University of New South Wales** — 2020
  Vingroup — *Hanoi, Vietnam*
- **Top 30 finalists of National Young Engineer and Scientist Award** — 2019
  Ministry of Science and Technology & Honda Foundation — *Hanoi, Vietnam*
- **Gold Medalist of the PFIEV Aerospace Engineering Cohort** — 2018
  Ho Chi Minh City University of Technology — *Ho Chi Minh City, Vietnam*
- **Merits for Quintessential Student of HCMUT** — 2018
  Ho Chi Minh City University of Technology — *Ho Chi Minh City, Vietnam*
- **Excellent Student Scholarship** — 2017, 2018
  Ho Chi Minh City University of Technology — *Ho Chi Minh City, Vietnam*
- **First Prize in Ho Chi Minh City Physics Olympiad (ranked 5th)** — 2012
  Ho Chi Minh City Department of Education and Training — *Ho Chi Minh City, Vietnam*

RESEARCH INTERESTS

- **Machine Learning Methods in Robotics and Transportation:** Bayesian Inference, Dimensionality Reduction, Changepoint Detection, Estimation, Filtering, Tracking and Unsupervised Learning.
- **Large Language Models in Time Series Processing:** BERT, LLaMA...

JOURNAL PAPERS

1. D. T. Hoang*, V. Martinez, P. Maréchal, D. Delahaye, "Exploring the Random Impulses Vehicle Trajectory Model for Dimensionality Reduction and Motion Extraction from Aerial Videos," IEEE Transactions on Intelligent Transportation Systems, 2023, **in submission**, manuscript.
2. D. T. Hoang*, V. Martinez, P. Maréchal, D. Delahaye, "Probabilistic Methods for Real-time Unsupervised Anomalous Trajectory Detection," IEEE Transactions on Intelligent Transporation Systems, 2021, **under revision**, manuscript.
3. T. L. Ngo, D. T. Hoang, T. H. H. Le, "Dynamics Modeling and Pitching Parameters Identification of a Novel Hybrid UAV," Journal of Aeronautics, Astronautics and Aviation, 52(1), 2020, pp. 25-36.
4. M. N. To, D. D. Ngo, T. L. Ngo, D. T. Hoang, T. H. H. Le, "Dynamic Modelling and Simulation for Tricopter," Journal of Aeronautics, Astronautics and Aviation, 52(1), 2020, pp. 37-55.

PATENTS

1. D. T. Hoang, D. Delahaye, V. Martinez, "Optimization of message generation frequency and compression of V2X data," European Patent No EP22306821.4, **pending**.

CONFERENCE PAPERS

1. D. T. Hoang*, B. Wang, Y. Li, D. Delahaye, P. Wei, "Anchored Multidimensional Scaling: Hidden Gems in Trajectory Clustering and Traffic Comparison in Similar Thunderstorm Developments," **in preparation**.
2. D. T. Hoang*, D. Delahaye, "Online Detection and Localization of Anomalous Aircraft Trajectories during Landing: A Bayesian Hypothesis Testing Approach," **in preparation**.
3. D. T. Hoang*, V. Martinez and D. Delahaye, "Dual Dirichlet Processes for Unsupervised Segmentation of Functional Data with Application to Lane-changing Behavior Characterization," **in preparation**.
4. D. T. Hoang*, V. Martinez and D. Delahaye, "Spherical Codec for V2X Cooperative Awareness Trajectory Compression: A Preliminary Study," 97th IEEE Vehicular Technology Conference (VTC), 2023.
5. D. T. Hoang*, V. Martinez and D. Delahaye, "Recognition of Outlying Driving Behaviors: A Data-Driven Perspective with Applications to V2X Collective Perception," 2021 IEEE Vehicular Networking Conference (VNC), 2021, pp. 52-59, doi: 10.1109/VNC52810.2021.9644627.
6. D. T. Hoang*, H. T-H. Le, and T. D. Ngo, "State Estimation in Visual Inertial Autonomous Helicopter Landing Using Optimization on Manifold," 15th International Conference on Intelligent Unmanned Systems, Beijing, China, 2019.
7. T. A. K. Nguyen, M. N. To, D. T. Hoang, T. L. Ngo, T. H. H. Le, N. H. Nguyen "Dynamic modeling and simulation for tricopter", South East Asian Workshop on Aerospace Engineering 2019," Kuala Lumpur, Malaysia, 2019.
8. T. L. Ngo, D. T. Hoang, T. H. H. Le, "Dynamics Modeling And Parameter Identification Of A Novel Hybrid UAV Using Maximum Likelihood," South East Asian Workshop on Aerospace Engineering 2019, Kuala Lumpur, Malaysia, 2019.
9. T. L. Ngo, D. T. Hoang, T. A. K. Nguyen, K. Nguyen, M. D. Nguyen, H. T. Pham, T. H. H. Le, N. H. Nguyen, "HOPE – A novel UAV design suitable for efficient VTOL and cruising missions," 15th International Conference on Intelligent Unmanned Systems, Beijing, China, 2019.
10. D. T. Hoang*, T. H. H. Le, N. N. Hien, "Application and Simulation of the Nonlinear Geometric Controller for Quadrotor UAVs," Symposium of the South East Asian Workshop on Aerospace Engineering (SAWAE), Bangkok, Thailand, 2018.

11. D. T. Hoang*, H. A. Ly, "Scaling the 50th Percentile Hybrid III dummy model to the height and the weight of a typical Vietnamese," Symposium of the South East Asian Technical Universities Conference (SEATUC), Ho Chi Minh City, Vietnam, 2016.

TEACHING EXPERIENCES

- **Introduction to Python Programming** 2020, 2022, 2023
  ENAC IATOM *Toulouse, France*

LANGUAGES

- **Languages**: Vietnamese (native), English (TOEIC 985, IELTS 7.0), French (DELF B1).

SERVICES

- Reviewer for Journal of Aerospace Information Systems.

SKILLS SUMMARY

- **Programming languages**: C++, Python and R.
- **Tools**: SUMO, OMNET++, TensorFlow, PyTorch.