Profile

I aim to lead in applying generative AI in automotive and aviation, and in advancing wireless technologies. I excel at turning complex requirements into neural network and signal processing designs, blending deep theory with practical skills to create innovative solutions. I value collaboration, innovation, and tech transformation for sustainable and equitable change.

Website & Project Portfolio

thinhhoang95.github.io

Address

30 Impasse du Ramier
des Catalans
31000 Toulouse, France

Phone

+33 7 75 23 46 66 (France)
+1 920 306 1051 (USA)
+84 97 179 5498 (Vietnam)

Email

hdinhthinh@gmail.com

Availability

France: anywhere
USA: Washington, D.C. area
Vietnam: Ho Chi Minh City area

Languages

French (DELF B1)
English (IELTS 7.5)
Vietnamese (native)

Tech Skills

AI
python
pandas
pytorch
LLM fine-tuning
computer vision
Networking & Embedded
C++
wireless
Statistics and Probability
statistical inference
probability theory
Web Development
react
react-native
web design

Thinh Hoang (HE/HIM)

Ph.D. in Applied Mathematics from University of Toulouse specializing in Signal Processing and Machine Learning in Automotive, Aviation and Communication Technologies.

Work & Research Experience

Ph.D. Candidate, Artificial and Natural Intelligence Toulouse Institute (ANITI)
Software Engineer, NXP Semiconductors
Sep 2020 – Jan 2024 · Toulouse, France · Thesis defended on 15 January
Thesis Advisors: Daniel Delahaye (ENAC), Pierre Maréchal (UPS), Vincent Martinez (NXP).

Project: V2X Collective Perception Project (in collaboration with NXP Semiconductors, Toulouse, France)

- Proposed innovative generative models for road vehicle trajectories, bypassing the data scarcity problem, based on quantitative analysis.
- Employed statistical inference and probability theory to design algorithms that provide performance guarantees.
- Analysis revealed 3000% improvement over standardization and 40% improvement over state-of-the-art.
- Realized novel algorithms with Python and C++ on proprietary embedded platforms.
- Author of one filed European patent and two publications.

Project: Generative AI / Large Language Model (LLM) in Safeguarding Air Traffic Control's Command Following (in collaboration with ENAC Lab, Toulouse, France)

- Designed a data-driven flight simulator using past trajectories.
- Successfully fine-tuned LLaMA2 7B network to generate instructions for the simulator.
- Successfully circumvented the hallucination and data scarcity problems in training by using a synthesized approach.
- The system successfully detected failures to follow ATC command in all given tests.
- Poster exhibited at a SESAR Joint Union conference event.

Project: Thunderstorms Effects on Airport Air Traffic Operations (in collaboration with IASL at George Washington University, USA)

- Designed custom neural networks using PyTorch.
- Proposed new algorithms to assist visualization, derive efficient representations of air traffic situations for acceleration of training reinforcement learning algorithms.
- Used OpenCV for clustering of similar thunderstorms.

Lecturer, École Nationale de l'Aviation Civile
Sep 2020 – Jan 2024 · Toulouse, France
Course taught: Python programming.

- Significantly enhanced students' coding abilities through targeted instruction and practical exercises.
- Managed e-learning platforms to provide accessible and engaging learning experiences.
- Optimized resources for individual and group learning needs.
- Fostered a vibrant learning culture, emphasizing collaboration, continuous feedback, and mutual respect.
- Improved coding proficiency and promoted a supportive, inclusive educational environment.
- Encouraged lifelong learning and innovation among students.

Competencies

communication
teamwork
problem-solving
critical thinking
cultural competence
commitment to results

Lecturer, Ho Chi Minh City University of Technology
2019-2020 · Ho Chi Minh City, Vietnam
Courses taught: Aerodynamics, Avionics (Guidance, Navigation & Control)

Project: Visual-Inertial State Estimation for UAV Landing

- Proposed custom Kalman filter based approach for precise landing of UAV on a helipad.
- One first-author conference paper in ICIUS 2019, two co-authored papers in UAV design and aerodynamic parametric estimation.
- Led one student's team for competition in the university's UAV design contest and won the second prize.

Full-Stack Engineer, AriaTec Ltd
2018-2019 · Ho Chi Minh City, Vietnam

- Designed and developed a mobile application for an at-home hydroponics solution, targeting the Android platform using Java for seamless native experience.
- Integrated MQTT protocol for real-time messaging between the app and hydroponics hardware.
- Implemented Apollo Graph API for the backend server, facilitating robust data management and interactions between the app and server.
- Successfully scaled the application with Docker to serve hundreds of customers, demonstrating its reliability, user-friendliness, and effectiveness in managing at-home hydroponics systems.

Side Hustles

A Comprehensive Personal Time Management Solution
React.js · React Native · Express.js
Indie development using ES6 JavaScript to realize a comprehensive time management solution that integrates to-do lists, calendar, pomodoro and various time planning techniques. To be published on Google Play in 2024.

- A hybrid Android - React-Native application for progress review, goal tracking, to-dos and planning.
- A Web-based interface realized on React.js to display real-time information on a Raspberry Pi powered device.

Accumulated project management skills include requirement analysis, project scheduling, system design, UI/UX design, testing and deployment.
More info on thinhhoang95.github.io

Education

Ph.D. Degree, University of Toulouse · 2024
Applied Mathematics.

Master's Degree, Ho Chi Minh City University of Technology · 2019
Aerospace Engineering · GPA: 8.93/10.

Engineering Degree (Diplôme d'Ingénieur), Ho Chi Minh City University of Technology · PFIEV Program · 2018
Aerospace Engineering · GPA: 8.48/10 · Total ECTS: 274.

With an addendum to the Engineering Degree signed by ISAE-ENSMA. Figures among the foreign academic titles recognized by the French State. Eligible for the EUR-ACE Master label issued by ENAEE.

Courses relevant: Data Structures and Algorithms, Object-Oriented Programming Language, Computer Networking, Symbolic Computation and Applications.

Honors

Second Prize, My Thesis in 180s, ENAC · 2022
Ph.D. Fellowship, Université de Toulouse, France · 2020
Ph.D. Fellowship, University of New South Wales, Australia · 2020
Top 30 finalists of the National Young Scientist Award · 2019
Gold Medalist of the PFIEV Aerospace Engineering Cohort · 2018
Merits for Quintessential Student of HCMUT · 2018
Excellent Student of HCMUT · 2017, 2018

Select Publications

- 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.
- D. T. Hoang*, V. Martinez, P. Maréchal, D. Delahaye, "Probabilistic Methods for Real-time Unsupervised Anomalous Trajectory Detection," IEEE Transactions on Intelligent Transportation Systems, 2021, under revision.
- 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.
- 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.