

Duc Anh Nguyen

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RESEARCH INTEREST

My research aims to uncover the fundamental mathematical principles governing state-of-the-art foundation models, leveraging these theoretical insights to build the next generation of efficient, interpretable, and robust Large Language Models (LLMs) and Vision-Language Models (VLMs).

EDUCATION

- **Hanoi University of Science and Technology (HUST)** Oct 2020 – Sep 2024
Hanoi, Vietnam
B.S. in Mathematics and Informatics
 - Valedictorian (Ranked 1st), CGPA: 3.92/4.00.
 - Recipient of Merit Scholarship for Academic Excellence (all semesters).
 - Thesis: Steepest Descent for Multi-Objective Optimization and Machine Learning Applications.
- **High School for Gifted Students, VNU University of Science (HSGS)** Sep 2017 – Sep 2020
Hanoi, Vietnam
High-Quality Class
 - GPA: 9.5/10 (Top 1%), graduated with high distinction.

RESEARCH EXPERIENCE

- **AI Research Resident** Mar 2024 – Present
Hanoi, Vietnam
VinAI Research (acquired by Qualcomm)
 - Supervisor: Dr. Toan Tran, Assistant Professor Tan Minh Nguyen.
 - Research Topic: Efficiency, Scalability, and Robustness of Foundation Models (State-Space Models and Sparse Mixture of Experts).
- **Research Student** Aug 2022 - Aug 2024
Hanoi, Vietnam
Modeling, Simulation and Optimization in Data Science (HATLAB), HUST
 - Supervisor: Dr. Thang Tran Ngoc.
 - Research Topic: Multi-objective Optimization in Machine Learning.

PUBLICATIONS & PATENTS

1. **Selective Sinkhorn Routing for Improved Sparse Mixture of Experts.**
Duc Anh Nguyen*, Huu Binh Ta*, Nhuan Le Duc, Tan Minh Nguyen, Toan Tran.
US Patent filed by Qualcomm, 2025
2. **Determinants of Credit Risk under the Basel II Accord: A Case Study of the Vietnamese Banking Sector.**
Ngo Thu Giang, **Duc Anh Nguyen**, Vu Thi Thao Chi, Nguyen Bao Anh, Nguyen Tai Quang Dinh.
International Conference on Emerging Challenges in Economics and Business (ICECH 2023)
3. **Adaptive Conflict-Averse Multi-gradient Descent for Multi-objective Learning.**
Dinh Van Tuan, Tran Anh Tuan, **Duc Anh Nguyen**, Bui Khuong Duy, Tran Ngoc Thang.
International Conference on Intelligence of Things (ICIT 2023)
4. **Exploration of Plane Geometry [Book].**
Le Xuan Hoang, **Duc Anh Nguyen**.
Vietnam National University Press, 2022.

PREPRINTS

1. **Selective Sinkhorn Routing for Improved Sparse Mixture of Experts**, *Under review*, 2025
Duc Anh Nguyen*, Huu Binh Ta*, Nhuan Le Duc, Tan Minh Nguyen, Toan Tran
2. **Artificial Intelligence in Metal Additive Manufacturing: Current Status, Challenges, and Future Developments**, *Under review*, 2025
Duc Anh Nguyen*; Bui Truong Giang Le*; Van Anh Nguyen; Minh Tuan Vu; Manh Ha Bui; Minh Thanh Le; Trong Duc Nguyen; Tien Dung Hoang; Xuan Hai Le
3. **A Steepest Gradient Method with Nonmonotone Adaptive Step-sizes for the Nonconvex Minimax and Multi-Objective Optimization Problems**, *Under review*, 2025
Duc Anh Nguyen, Tran Ngoc Thang

TALKS

- Workshop on Scientific Computing and Applications (Talk in session with discussion): “The Minimax Approach for solving non-convex multiobjective optimization and Applications”, 2024
- VIASM Summer school “Research Experience for Undergraduates” (Talk in session with discussion): “The Steepest Descent Method for Solving Nonconvex Minimax Problem and Applications to Multi-Task Learning”, 2023

HONORS & AWARDS

- **National Program for the Development of Mathematics Scholarship** Nov 2023 – Apr 2024
Vietnam Institute for Advanced Study in Mathematics (VIASM)
 - Awarded twice for outstanding academic performance in 2023–2024.
- **“Five-Good Student” Award** Jan 2024
Hanoi City, Vietnam
 - Recognized for excellence in academics, ethics, physical fitness, volunteer work, and international integration.
- **Gold Medal – International Youth Math Challenge** Nov 2023
 - Final-round participant; ranked among top 2% of all participants.
- **Exness Scholarship** Aug 2023
Hanoi University of Science and Technology & Exness Corporation
- **Third Prize – VIASM Summer School “Research Experiences for Undergraduates”** Aug 2023
Vietnam Institute for Advanced Study in Mathematics (VIASM)
- **Gold Medal – Iranian Combinatorics Olympiad** Jun 2022
- **Silver Medal – Iranian Geometry Olympiad** Nov 2019
 - Ranked 4th nationally in Vietnam and 22nd globally during high school.

LANGUAGE & CERTIFICATIONS

- Vietnamese: Native
- English: IELTS Academic **7.0 Overall** (Listening 7.0, Reading 7.0, Writing 6.5, Speaking 6.5).

REFERENCES

1. **Dr. Toan Tran**
Senior Staff Engineer, Qualcomm AI Research
toatran@qti.qualcomm.com
Relationship: Mentor
2. **Dr. Tran Ngoc Thang**
Lecturer, Faculty of Mathematics and Informatics, Hanoi University of Science and Technology
thang.tranngoc@hust.edu.vn
Relationship: Undergraduate Thesis Supervisor