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Long P. Hoang

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RESEARCH INTEREST

My research focus has been improving the optimization techniques for Multi-Task deep neural networks, profiling the trade-off between the conflicting tasks, and investigating their effectiveness in large-scale problems such as Recommender Systems, Large Language Models.

EDUCATION

PhD **Singapore University of Technology and Design (SUTD)** **09/2024 – Present**

- Academic advisor: Assoc. Prof. Lu Wei
- Major: Computer Science

Bachelor **Hanoi University of Science and Technology (HUST)** **08/2018 – 09/2022**

- Academic advisor: Dr. Thang N. Tran
- Major: Mathematics and Informatics. CPA: 3.11/4.00 (Rank 18 out of 94 in my department)

PUBLICATIONS

[1] Quang-Huy Nguyen[†], **Long P. Hoang**[†], Vu V. Hoang, Dung D. Le, Controllable Expensive Multi-objective Optimization with Warm-starting Gaussian Process, *arXiv preprint arXiv:2311.15297*, 2024

[2] Tuan A. Tran[†], **Long P. Hoang**[†], Dung D. Le, Thang N. Tran, A Framework for Controllable Pareto Front Learning with Completed Scalarization Functions and its Applications, *Neural Networks* , 2024

[3] **Long P. Hoang**, Dung D. Le, Tuan A. Tran, Thang N. Tran, Improving Pareto Front Learning via Multi-Sample Hypernetworks, *In Proceedings of the AAAI Conference on Artificial Intelligence*, 2023

[4] Anh T. Ho, Tuan A. Tran, **Long P. Hoang**, Ha H. Le, Thang N. Tran, Multi Deep Learning Model for Building Footprint Extraction from High-Resolution Remote Sensing Image, *In Intelligent Systems and Networks*, 2022

EXPERIENCE

NLP Engineer **FTech Co., Ltd**

Developing a General Natural Language Understanding tool for Vietnamese *12/2023 – 06/2024*

- Developed a NER model recognizing 9 popular entities for Vietnamese with 0.91 f1-score using Transfer Learning and Adversarial Training
- Constructed an Entity Linking model that obtained a 0.85 accuracy without a degradation in the performance of the NER model
- Reduced half of the VRAM of the LLM Mistral-7b using SmoothQuant

Research Assistant **College of Engineering and Computer Science, VinUniversity**

Advisor: Assist. Prof. Dung D. Le

Controllable Multi-Objective Recommender System *10/2022 – 10/2023*

[†]Co-First Author

- Developed a new framework for Multi-Objective Recommendation which considers a variety of criteria, including fairness, robustness, novelty in special scenarios such as cold start, adversarial attack,...

Expensive Multi-Objective Optimization *03/2023 – 10/2023*

- Built high-dimensional Bayesian Optimization methods by estimating the gradient of Black-Box functions
- Approximated the entire trade-off curve of black-box objects using Pareto Front Learning with Hypernetworks computed by Gaussian Processes

Profiling the Pareto Front in Multi-Task Learning *02/2022 – 10/2022*

- Proposed a novel method named Multi-Sample Hypernetwork to approximate the entire trade-off curve of conflicting objectives (accepted to AAAI 2023)

Teaching Assistant *02/2022 – 07/2022*

- Supported Assist. Prof. Dung D. Le during the lecture class and held office hours in class "Database Concepts and Skills for Big Data", AY 2021-2022

Undergraduate Research Assistant **School of Applied Mathematics and Informatics, HUST**

Advisor: Dr. Thang N. Tran

Multi-Objective Optimization with Completed Scalarizations *02/2022 – 02/2023*

- Proposed and proved the convergence of a new framework for Pareto Multi-Task Learning with Scalarization Functions in the pseudo-convex and quasiconvex assumptions (accepted to the journal Neural Networks)

Building Footprint Extraction from Remote Sensing Images *07/2021 – 10/2022*

- Developed a two-stage framework, which combines U2-Net and Mask-CNN, to increase 1.8-2.5% mAP, mAR for Building Footprint Extraction, especially effective in populated areas (accepted to ICISN 2022)

PERSONAL SKILLS

Languages	IELTS 6.0 (L 5.5, R 6.5, W 6.0, S 6.5), GRE (V 139, Q 161, A 3.0)
Programming Languages	Python, C
Frameworks	Latex, Pytorch, Scikit-Learn, Numpy, Pandas, Matplotlib, Docker

ADWARDS & CERTIFICATES

- 3rd Prize (Grooo International company's sponsorship) in Scientific Research Student Conference at School of Mathematics and Informatics, Hanoi University of Science and Technology, Jul 2022
- Certificate of Completion of Developer Circles Vietnam Innovation Challenge in Data Science, sponsored by Facebook, Nov 2020

REFERENCES

1. **Assoc. Prof. Lu Wei** (Ph.D), Information Systems Technology and Design
   luwei@sutd.edu.sg
2. **Assist. Prof. Dung D. Le** (Ph.D), College of Engineering and Computer Science, VinUniversity
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3. **Dr. Thang N. Tran** (Ph.D), School of Applied Mathematics and Informatics, Hanoi University of Science and Technology
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