

HOANG-CHAU LUONG

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Education

Bachelor of Science in Computer Science, VNUHCM-University of Science

2020 – 2024

Advanced Program in Computer Science

Overall GPA: 3.82/4.00

Research Experience

SELab VNUHCM-University of Science

2023 – 2024

Research Assistant - Supervised by Prof. Minh-Triet Tran and M.Sc. Thuc Nguyen-Quang

- Research on Sharpness Aware Minimization (SAM) - Identify the problems with SAM and lead the project.
- Investigate the performance difference between SAM and SGD in the presence of noisy labels.
- Propose various hypotheses about these differences, conduct empirical validations, and further enhance SAM's performance.

Research Interest

My research is driven by the fundamental question: *How can we enhance AI safety in practice?* Current deep neural network training relies on **gradient-based methods**, which, despite their effectiveness, can fail in challenging scenarios such as noisy labels, out-of-distribution, or imbalanced class datasets. In these situations, these methods often overfit to noise or introduce biases, reducing model reliability. Motivated by these challenges, I focus on understanding and improving **training dynamics** to enhance **model generalization** in difficult settings. As a first step, I analyzed the behavior of perturbed gradients in Sharpness-Aware Minimization (SAM) under noisy label conditions. This work aims to slow down the fitting of noisy labels, improving generalization and contributing to safer and more robust AI systems. Currently, my work includes (but is not limited to):

1. **Understanding Training Dynamics:** identifying interesting phenomena that occur during training and establishing theories about them.
2. **Model Robustness:** developing methods to improve neural networks' performance on out-of-distribution datasets, noisy labels, and imbalanced class datasets.

Publications

[1](**NeurIPS 2024**) Pham Duy Khanh, [Hoang-Chau Luong](#), Boris S. Mordukhovich, Dat Ba Tran. “Fundamental Convergence Analysis of Sharpness-Aware Minimization”

[2](**CVPR 2024 Workshop**) Tuan-An To, Minh-Nam Tran, Trong-Bao Ho, Thien-Loc Ha, Quang-Tan Nguyen, [Hoang-Chau Luong](#), Thanh-Duy Cao, Minh-Triet Tran. “Multi-perspective traffic video description model with fine-grained refinement approach”

[3](**SOICT 2023**) [Hoang-Chau Luong](#), Minh-Triet Tran. “Applying Adaptive Sharpness-Aware Minimization to Improve Out-of-distribution Generalization”

[4](**RIVF 2022**) Tuan-An To, [Hoang-Chau Luong](#), Nham-Tan Nguyen, Trong-Tin Nguyen, Minh-Triet Tran, Trong-Le Do. “Deepfake Detection using EfficientNet: Working Towards Dense Sampling and Frames Selection”

Preprint

[1](**Under review**) [Hoang-Chau Luong](#), Thuc Nguyen-Quang and Minh-Triet Tran. “Improving Resistance to Noisy Label Fitting by Reweighting Gradient in SAM”

Reviewer

- ICLR 2025

Achievements

Awards

Awards for excellent achievements in Research activities.	11/2024
Excellence scholarship for semester III.	9/2023

AI Competition

Consolation prize in AI Challenge Ho Chi Minh City, Event Retrieval from Visual Data.	10/2023
Consolation prize in AI Challenge Ho Chi Minh City, Event Retrieval from Visual Data.	10/2022
Top 12/69 on private test in FathomNet - FGVC10 workshop at CVPR 2023	4/2023

Competitive Mathematics

1 st prize in Ho Chi Minh City Mathematics Olympiad Competition	4/2020
Silver Medal in Southern Vietnam Mathematics Olympiad Competition	4/2019
Bronze Medal in Southern Vietnam Mathematics Olympiad Competition	4/2018

Skills

Programming Languages: Proficient in Python and experienced in writing C++, and Bash.

Technologies/Frameworks: Pytorch, HuggingFace, Linux

References

Reference 1: Minh-Triet Tran (advisor)

1. Affiliation: VNUHCM-University of Science, Vietnam
2. Title: Associate Professor
3. Email: tmtriet@fit.hcmus.edu.vn

Reference 2: Dat Ba Tran (advisor)

1. Affiliation: Wayne State University, Michigan, USA
2. Title: Ph.D. Candidate
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Reference 3: Boris S. Mordukhovich

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