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Anh T. Nguyen

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RESEARCH INTEREST

My research goals aim to develop scalable multimodal AI systems that effectively integrate perception, reasoning, and action. I aim to study efficient reasoning in LLMs via advanced RL-based optimization and adaptive thinking budget allocation, with the goal of addressing overthinking behaviors and improving token efficiency. Furthermore, I intend to investigate Agentic AI, specifically focusing on latent reasoning frameworks and hierarchical planning to enable robust, long-horizon task execution in complex environments.

EDUCATION

Bachelor of Science, VNU University of Engineering and Technology **Sep 2019 – Jan 2024**

- Major: Robotics Engineering.
- **GPA: 3.70/4.00**. **Ranked: 6/282 (Top 2% of the Faculty)**.
- Academic advisor: **Assoc. Prof. Tung Bui Thanh**

PUBLICATIONS

[1] Dung V. Nguyen†, **Anh T. Nguyen**†, Minh H. Nguyen, Luc Q. Nguyen, Shiqi Jiang, Ethan Fetaya, Linh D. Tran, Gal Chechik, Tan M. Nguyen. *Expert Merging in Sparse Mixture of Experts with Nash Bargaining*. International Conference on Learning Representations (ICLR), 2026. † Co-first authors.

Contribution: Co-designed expert merging strategy, implemented training pipeline, conducted empirical evaluation.

[2] Hoang A. Phan, **Anh T. Nguyen**, Loc Q. Do, Tung T. Bui, Chun-Ping Jen, Trinh C. Duc. *Image-based machine learning quantitative evaluation of bead–cell binding interaction*. Sensors and Actuators A: Physical (Q1), 2025.

Contribution: Developed computer vision framework for quantitative biomedical image analysis.

[3] Hoang A. Phan,**Anh T. Nguyen**, et al. *Magnetic Bead Conjugated Lung Tumor Cell Binding Efficiency Assessment Based on Deep Learning*. International Conference on Health Science and Technology (ICHST), 2023.

Contribution: Built detection and segmentation pipeline for small biomedical datasets.

[4] Hoang A. Phan, Van T. Duong, Mai N. Thi, **Anh T. Nguyen**, et al. *Development of an Autonomous Component Testing System with Reliability Improvement Using Computer Vision and Machine Learning*. ECTI Transactions on Computer and Information Technology (ECTI-CIT), 2024.

Contribution: Developed machine learning models, created system software.

EXPERIENCE

Artificial Intelligence Reseacher **Oct 2023 — Present**
Viettel AI Ha Noi, Viet Nam

Vietnam-focused Image Captioning Framework

- Developed few-shot learning-based classifiers leveraging VLMs/LLMs to detect and categorize Vietnamese cultural attributes in images.
- Built a VQA supervised dataset using CoT-guided annotation, improving reasoning consistency and label quality.
- Developed a VLM model for multi-tag recognition and implemented prompts knowledge injection techniques to enrich cultural details and improve caption specificity.

Efficient Model Learning

- Proposed a novel direction by framing expert merging as a cooperative-competitive game, integrating the Nash bargaining solution to achieve more balanced expert aggregation.
- Introduced a complex-momentum mechanism designed to accelerate convergence significantly beyond prior approaches

Visual Content Understanding

- Built an open-vocabulary object model to identify 15 categories of harmful content on social media, enabling image-level classification and detection of harmful-content chunks in video.

Data Science and Artificial Intelligence Intern (Viettel Digital Talent) **Apr 2023 — Oct 2023**
Viettel Group Ha Noi, Viet Nam

Face anti-spoofing, eKYC project

- Developed multi-modal approaches to unified physical - digital face attack detection, applied in Viettel's eKYC products in domestic and foreign markets.

Undergraduate Research Assistant **Jan 2020 — Apr 2023**
Laboratory of Micro Electro-Mechanical Systems (MEMS Lab) VNU, UET

Magnetic Bead Conjugated Lung Tumor Cell Binding Efficiency Assessment

- Proposed a framework for analyzing bead-cell interactions with A549 lung cancer cells from two image modalities from microscope.
- Built high-performance pipeline combining object detection, segmentation, and advanced image-processing methods to effectively manage small datasets and detect very small objects.
- Designed evaluation protocols for quantitative biological analysis

Robot pick and place component in industry

- Developed computer vision systems for industrial pick-and-place inspection.
- Designed software communication architecture between PLC, embedded devices, and vision modules.

SKILLS

Programming: Python
Machine Learning: PyTorch, HuggingFace Transformers, OpenCV, Scikit-learn
Research: Modeling, dataset curation, experiment design, multimodal training, model evaluation
Systems: Linux, Git, Docker

SELECTED AWARDS & HONORS

Jan 2024 **Excellence Award for Outstanding Students**
Issued by VNU, University of Engineering and Technology
Top 1% of students who receive this award.

Jan 2024 **Best Thesis Award**
Issued by VNU, University of Engineering and Technology
Project "Application of computer vision for automated assessment of the efficiency of magnetic bead-cell conjugation in lung cancer cells A549."

Jan 2024 **Academic Encouragement Scholarship**
Issued by VNU, University of Engineering and Technology

May 2023 **First Prize - Scientific Research Student Award**
Issued by VNU, University of Engineering and Technology
Project "Research and development of cell packaging microfluidic systems for single cell analysis application."

Dec 2022 **Third Prize - National Student Science and Technology Award**
Issued by Vietnam Ministry of Education and Training
Project "Development of an autonomous component testing system with reliability improvement using computer vision and machine learning."

Nov 2022 **Appellation "Student of 5 merits"**
Issued by Hanoi Students' Union

Nov 2022 **PonyChung Scholarship**
Issued by PonyChung Foundation

May 2022 **First Prize - Scientific Research Student Award**
Issued by VNU, University of Engineering and Technology

Apr 2021 **Co - Founder UET Robotics Club**
A professional club, affiliated to the University of Engineering and Technology Students' Union.

Dec 2020 **Academic Encouragement Scholarship**
Issued by VNU, University of Engineering and Technology

REFERENCES

Assoc. Prof Tung Bui Thanh
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Dr. Linh Duy Tran
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