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Anh T. Nguyen

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RESEARCH INTEREST

I earned my Bachelor's degree in Robotics Engineering from VNU University of Engineering and Technology (VNU, UET), where my research focused on applying artificial intelligence to robot perception and biomedical imaging. My current research interests include vision-language models (VLMs), multi-modal large language models (LLMs), and reasoning in AI. I am particularly interested in developing multi-modal frameworks for grounded understanding and compositional reasoning, with applications in face anti-spoofing detection, visual content understanding, and culturally-aware image captioning in the Vietnamese context.

EDUCATION

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

- Major: Robotics Engineering. GPA: 3.70/4.00.
- Academic advisor: **Assos. Prof. Dr 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, and Tan M. Nguyen. "Expert merging in sparse mixture of experts with Nash bargaining". In: *arXiv preprint* (2025). Under Review at ICLR 2026.

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

[3] Hoang A. Phan, **Anh T. Nguyen**, Nguyen D. Pham, Hien V. Dinh, Bao L. Dang, Tung T. Bui, Chun-Ping Jen, Loc D. Quang, Hai H. Nguyen, and Trinh C. Duc. "Magnetic Bead Conjugated Lung Tumor Cell Binding Efficiency Assessment Based on Deep-Learning Approach". In: *Proceedings of the 1st International Conference on Health Science and Technology (ICHST)*. 2023.

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.

Mixture of Expert Models

- Integrated Nash bargaining and complex momentum to merge experts more fairly and efficiently, outperforming prior methods across tasks.

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 Digiatal 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 Mirco 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.

Robot pick and place component in industry

- Using image processing techniques, machine learning models to detect module positions, count defective components.
- System-wide software architecture design, communication programming between PLC, Arduino, NUC computer.

AWARDS & HONORS

Jan 2024 **Excellence Award for Outstanding Students of the 2019-2024 Cohort**
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 - Science and Technology Award for Students in Higher Education Institutions**
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

Assos. Prof. Dr Tung Bui Thanh
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University of Engineering and Technology, Vietnam National University
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PhD. Linh Duy Tran
Head of Technical, AI Division
Viettel AI - Viettel Group
Email: linhtd15@viettel.com.vn