E-Ro Nguyen

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Education

University of Science - Vietnam National University HCM City — *Ho Chi Minh City, Vietnam*

B.Sc. in Computer Science | ***Advanced Program in Computer Science*** — *Aug. 2018 - Nov. 2022*

- GPA: 3.94 / 4.00
- Supervisor: Assoc. Prof. Minh-Triet Tran
- Thesis title: Smart Interactive Retrieval of Visual Data via Semantic Understanding

Experience

2022 - 2023 **Teaching Assistant**, University of Science - VNUHCM — *HCMC, Vietnam*

2019 - 2023 **Research Assistant**, SELAB, University of Science - VNUHCM — *HCMC, Vietnam*

2021 - 2022 **Research Intern**, VinAI Research — *HCMC, Vietnam*

Publications

Improving Referring Image Segmentation using Vision-Aware Text Features (link) — *In submission*

E-Ro Nguyen*, Truong-Hai Nguyen*, Tuan-Anh Vu, Binh-Son Hua, Minh-Triet Tran, Sai-Kit Yeung — *2023*

V-FIRST 2.0: Video Event Retrieval with Flexible Textual-Visual Intermediary (link) — *MMM'23*

Nhat Hoang-Xuan, E-Ro Nguyen, Thang-Long Nguyen-Ho, Minh-Khoi Pham, ..., Minh-Triet Tran — *2023*

VLFormer: Visual-Linguistic Transformer for Referring Image Segmentation (link) — *Preprint*

E-Ro Nguyen, Nhat Hoang-Xuan, Tam V. Nguyen, Minh-Triet Tran — *2023*

Flexible Interactive Retrieval SysTem 3.0 for Visual Lifelog Exploration (link) — *ICMR'22*

Nhat Hoang-Xuan, Hoang-Phuc Trang-Trung, E-Ro Nguyen, Thanh-Cong Le, Minh-Triet Tran — *2022*

Visual-Language Transformer for Referring Video Object Segmentation (link) — *CVPRW'22*

E-Ro Nguyen, Nhat Hoang-Xuan, Minh-Triet Tran — *2022*

Attention-based Hierarchical Fusion Network for Predicting Media Memorability (link) — *MediaEval'21*

E-Ro Nguyen, Hai-Dang Huynh-Lam, Hai-Dang Nguyen, Minh-Triet Tran — *2021*

PointRend with Attention Fusion Refinement for Polyps Segmentation (link) — *MediaEval'21*

E-Ro Nguyen, Hai-Dang Nguyen, Minh-Triet Tran — *2021*

Efficient One-Shot Video Object Segmentation (link) — *NICS'20*

Nhat Hoang-Xuan*, E-Ro Nguyen*, Thuy-Dung Pham-Le, Khoi Hoang-Nguyen — *2020*

Video Object Segmentation with Memory Augmentation and Multi-Pass Approach (link) — *CVPRW'20*

The-Anh Vu-Le, Hong-Hanh, E-Ro Nguyen, Minh-Triet Tran — *2020*

Multi-Referenced Guided Instance Segmentation Framework for Semi-supervised VOS (link) — *CVPRW'20*

Minh-Triet Tran, Trung-Hieu Hoang, ..., E-Ro Nguyen, ..., Minh N. Do — *2020*

iTASK - Intelligent Traffic Analysis Software Kit (link) — *CVPRW'20*

Minh-Triet Tran, Tam V. Nguyen, ..., E-Ro Nguyen, ..., Minh N. Do — *2020*

Honors & Awards

2022 **First Prize**, Student Scientific Research Award(EURÉKA) — *HCMC, Vietnam*

2022 **Sixth Place**, The 4th Large-scale Video Object Segmentation Challenge — *New Orleans, U.S.A*

2022 **Fourth Place**, The 2021 ICPC Asia Hanoi Regional Contest — *Hanoi, Vietnam*

2021 **First Prize**, Ho Chi Minh City AI-Challenge 2021 — *HCMC, Vietnam*

2022 **Champion**, The 2021 ICPC National Vietnam Contest — *Vietnam*

2021 **Top 62nd**, Facebook Hacker Cup 2021 — *Online*

2020 **Excellent Student in Artificial Intelligence**, Ho Chi Minh city — *HCMC, Vietnam*

2020 **Half-year Scholarship for Excellent Student**, University of Science - VNUHCM — *HCMC, Vietnam*

2020 **Third Prize**, Ho Chi Minh City AI-Challenge 2020 — *HCMC, Vietnam*

2020 **Fourth & Sixth Place**, The 2020 DAVIS Challenge on Video Object Segmentation — *Online*

2020 **Sixth Place**, The 2020 ICPC Asia Cantho Regional Contest — *Can Tho, Vietnam*

2019 **Bronze Medal**, The 2019 ICPC Asia Danang Regional Contest — *Da Nang, Vietnam*

2019 **Fourth Prize**, Samsung Collegiate Programming Cup 2019 Final Round — *Seoul, Korea*

2018 **Bronze Medal**, The 2018 ICPC Asia Hanoi Regional Contest *Hanoi, Vietnam*
2018 **Full-year Scholarship for Freshman**, University of Science - VNUHCM *HCMC, Vietnam*
2018 **Bronze Medal**, The 2018 ICPC Asia Yangon Regional Contest *Yangon, Myanmar*
2018 **Participant**, Asia-Pacific Informatics Olympiad *Russia*

Projects

Vietnamese Elementary Math Solving using Large Language Models (link)
HCMC, Vietnam

Personal Project *Sep. 2023 - Nov. 2023*

- Fine-tuned LLMs models(Mistral, Vietcuna, LLaMA-2) to adapt the model for multiple choice and mathematics tasks.
- Applied QLoRA technique to optimize GPU memory and training/inference time.
- Collected, processed, and translated more than $20k$ multiple choice questions from English to Vietnamese to build a diversity training dataset and improve the model's generalization.
- Utilized GPT-3.5 to generate a step-by-step explanation for each question to improve 10% of model performance.
- Language/Technologies: Python, LangChain, OpenAI API

Referring Expression Segmentation (link)
HCMC, Vietnam

Research Project *Nov. 2022 - Aug. 2023*

- Collaborative research project with HKUST and Trinity College Dublin.
- Designed a multi-modal model to enhance the mutual information of vision and language.
- Proposed and implemented a contrastive loss to ensure further the coherent interpretation of language expressions.
- Utilized BERT to extract linguistic information and ResNet/Swin Transformer to encode visual information.
- Achievement: State-of-the-art on Referring Expression Segmentation datasets, and 1 paper is in submission.
- Language/Technologies: Python, PyTorch, OpenCV, Gradio

Smart Interactive Retrieval of Visual Data via Semantic Understanding (link)
HCMC, Vietnam

Thesis Project *Feb. 2022 - Aug. 2022*

- Developed a retrieval system with multiple effective filter algorithms to search and retrieve relevant images fast and accurately.
- Deployed a referring expression segmentation module to enhance the explainability of the retrieval system.
- Converted, stored and indexed millions of images as vector embeddings using vector database system Milvus.
- Achievement: Got 10/10 in thesis defense, First Prize in Student Scientific Research Award(EURÉKA).
- Language/Technologies: Python, PyTorch, OpenCV, Django, ReactJS, Milvus, Elasticsearch

Vietnamese Scene Text Recognition
HCMC, Vietnam

Personal Project *Oct. 2021 - Dec. 2021*

- Led a team of four to build a solution based on YoloV5 and MMOCR for detection and recognition of Vietnamese words in Scene Text images.
- Proposed and implemented a dictionary-guided heuristic algorithm to fix and eliminate wrong words, which boosts 3% in performance.
- Achievement: First Prize in the HCMC AI Challenge 2021.
- Language/Technologies: Python, PyTorch, OpenCV, Docker

Extracurricular Activity

Free Contest
HCMC, Vietnam

Problem Setter *Aug. 2017 – Mar. 2021*

- Creating the algorithmic problems in free algorithmic contest for the community in Vietnam.

Student Activities Board
HCMC, Vietnam

Core Member *Aug. 2017 – Mar. 2021*

- Non-profit organization playing as an officially functional board that hosts student activities.

Skills

- **Language**: Vietnamese (Native), English (Professional)
- **Programming**: Python, C/C++
- **Developer Tools**: Git/Github, Docker, Jupyter Notebook
- **Frameworks/Libraries**: PyTorch, Keras, OpenCV, NumPy, Matplotlib, FastAPI, Flask, Gradio, BentoML

References

Assoc. Prof. Minh-Triet Tran *tmtriet@fit.hcmus.edu.vn*

Vice President, Head of Software Engineering Lab, University of Science - VNUHCM, Vietnam

Asst. Prof. Binh-Son Hua *binhson.hua@tcd.ie*

School of Computer Science and Statistics, Trinity College Dublin, Ireland

Prof. Vu N. Duong *vu.duong@ntu.edu.sg*

Director of Air Traffic Management Research Institute, Nanyang Technological University, Singapore