

# Hao Phung

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## RESEARCH INTERESTS

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My primary research interests lie in the field of Computer Vision, with a specific focus on deep generative models. Currently, I am actively engaged in improving the efficiency and controllability of diffusion models, particularly in their application to conditional image generation.

## EDUCATION

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- **Vietnam National University Ho Chi Minh City - University of Science** Viet Nam  
*Bachelor of Computer Science; GPA: 8.40/10 (in-major GPA: 9.05/10); Rank: 14/320* Aug 2016 – Nov 2020
  - Coursework: Computer Vision, Machine Learning, Artificial Intelligence, Multivariate Statistical Analysis, Data structures & Algorithms.
- **Honors thesis:** Human action monitoring based on Visual question answering Aug 2019 - Aug 2020  
Advisor: [Assoc. Prof. Ngoc Quoc Ly](#); Grade: 10/10
  - Utilized human-prior knowledge formed as Task Ontology to instruct the system what visual tasks should be performed to produce a suitable answer for an input query under Surveillance context.

## PUBLICATIONS

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(\*) denotes equal contribution

- Quan Dao\*, [Hao Phung\\*](#), Binh Nguyen, Anh Tran, **Flow Matching in Latent Space**, *under review*, 2023. [[paper](#), [code](#), [page](#)]
- Thanh Van Le\*, [Hao Phung\\*](#), Thuan Hoang Nguyen\*, Quan Dao\*, Ngoc Tran, Anh Tran, **Anti-DreamBooth: Protecting users from personalized text-to-image synthesis**, in *International Conference on Computer Vision (ICCV)*, 2023. [[paper](#), [code](#), [page](#)]
- [Hao Phung\\*](#), Quan Dao\*, and Anh Tran, **Wavelet Diffusion Models are fast and scalable Image Generators**, in *Computer Vision and Pattern Recognition (CVPR)*, 2023. [[paper](#), [code](#)]
- H. Vo\*, [T.H. Phung\\*](#), and N. Ly, **VQASTO: Visual Question Answering System for Action Surveillance based on Task Ontology**, in *NAFOSTED Conference on Information and Computer Science (NICS)*, 2020. [[paper](#)]

## EXPERIENCE

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- **VinAI Research** Hanoi, Vietnam  
*AI Research Resident - Advised by [Dr. Anh Tran](#)* Aug 2021 - now
  - Project: [Flow Matching in Latent Space](#)
    - \* Introduce a latent flow matching framework that targets high-resolution image synthesis and various types of conditional image synthesis.
  - Project: [Anti-DreamBooth: Protecting Users from Personalized Text-to-Image Synthesis](#)
    - \* Introduce perturbation learning algorithms for enhanced user protection against malicious risks in personalized text-to-image synthesis.
  - Project: [Wavelet Diffusion Models are fast and scalable Image Generators](#)
    - \* Propose a wavelet-based diffusion scheme that accelerates image generation by leveraging low- and high-frequency components of wavelet subbands at the image and feature levels.
    - \* Achieve near real-time performance, effectively narrowing the speed gap with GAN counterparts.
- *Applied Rotation Program - Led by [Mr. Tin Trung Duong](#)* Jul 2022 - Oct 2022
  - Present a pipeline for Object Search using Open Vocabulary Object Detection that enables the retrieval of similar outputs based on a query object.

- Investigated SOTA semi-supervised learning for Image Classification and Monocular 3D Object Detection.
- Validated and benchmarked AI models for Autopilot projects (e.g. Camera Degradation, Lane detection).

• **Skeleton-Based Abnormal Behavior Recognition**

Ho Chi Minh, Vietnam

Research Collaborator - Led by [Assoc. Prof. Ngoc Quoc Ly](#) (cooperated with [SNA Global](#))

Sep 2019 - Mar 2020

- Developed a real-time anomaly action recognition system by enhancing time efficiency for pose tracking and transforming skeleton sequence to image as new spatio-temporal feature for action recognition.
- Improved accuracy of action recognition model by leveraging EfficientNet models and built up a minimal website using Flask framework for demonstration.

• **KMS Technology**

Ho Chi Minh, Vietnam

AI Engineer Intern - Advised by [Mr. Hoa Trong Vu](#)

Aug 2019 - Nov 2019

- Created new dataset (nearly 3000 images) by collecting and refining images manually for Image matching problem. Also, utilized Image Hashing algorithm for filtering out similar samples.
- Increased accuracy by 2.5% (at 96.5%) through fine-tuning state-of-the-art ImageNet models and adding new augmentation methods on the new dataset.

## OPEN-SOURCE PROJECTS

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• **Automatic License Plate Recognition (ALPR)**

Apr 2019 - Jun 2019

- Redesigned a handcraft algorithm for ALPR by adding FloodFill algorithm to extract plate more precisely and post-processing character image in plate to increase the accuracy of plate number recognition.
- Extended ALPR for motorbike plate recognition by utilizing Haar-Cascade Classifier to detect the plate.
- **Tech stack:** Python, OpenCV, Haar Cascade Classifier, SVM, Tesseract-OCR, Git.

• **Face Recognition**

May 2019 - Jun 2019

- Built a model for face recognition through utilizing cutting-edge face detection methods (e.g. SSD, Multitask-CNN) and optimizing the SVM model for identity recognition on our dataset.
- Adopted FaceNet for feature extraction as input to SVM model.
- **Tech stack:** Python, OpenCV, SSD, FaceNet, SVM, Facial landmarks, Git.

## HONOURS AND AWARDS

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- Outstanding thesis award 2020
- Top 5 IT students in academic year 2018 - 2019

## PROGRAMMING SKILLS

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- **Languages:** Python, C/C++, HTML/CSS, SQL.
- **Technologies:** PyTorch, Tensorflow, OpenCV, Scikit-learn, Git, L<sup>A</sup>T<sub>E</sub>X, Docker, Linux.

## EXTRACURRICULAR ACTIVITIES

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• **AI Day 2022**

Hanoi, Vietnam

Panel speaker

Aug 2022