QUANG-HUY NGUYEN

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Research Interests

I'm interested in Computer Vision, with a broad interest in object detection/segmentation, multi-modal learning, few-shot learning, and Vision Transformer.

Education

Vietnam National University - Ho Chi Minh City (VNU-HCM) Ho Chi Minh City, Vietnam

- ***University of Information Technology (UIT)*** *Faculty of Computer Engineering*
  ***Bachelor**, Computer Engineering – CGPA: 7.84/10* *August, 2015 - May, 2020*

Publications

LSPD: A Large-Scale Pornographic Dataset for detection and classification Accepted, unpublished

- *Duy Phan, Thien Nguyen, **Huy Nguyen**, Loc Tran, Khoi Nguyen, Lung Vu* *Journal*
  International Journal of Intelligent Engineering and Systems *IJIES*
  - Developed a large scale visual dataset (500,000 images and 4,000 videos) for pornographic object detection/segmentation, image/video classification tasks
  - Proposed benmark scenarios for model evaluation using this LSPD dataset

A Novel Pornographic Visual Content Classifier based on Sensitive Object Detection June, 2021

- *Duy Phan, Thien Nguyen, **Huy Nguyen**, Loc Tran, Khoi Nguyen, Lung Vu* *Journal*
  Journal of Advanced Computer Science and Applications *IJACSA*
  - Proposed a method for pornography visual classification which combines object detection, skin extraction and human localization via SVM discrimination model. Achieved performance of 94.88% accuracy on NPDI-800.
  - Developed a practical extension for sexual website alerting and blocking using NaiveBayes for textual classification and YOLO for visual detection. Achieved performance of 99.50% accuracy on a custom 200-website dataset.

Additional learning on object detection: a novel approach in pornography classification November, 2020

- *Loc Tran, **Huy Nguyen**, Duy Phan, Thien Nguyen, Khoi Nguyen, Lung Vu,* *Conference*
  International Conference on Future Data and Security Engineering *FDSE-2020*
  - Developed a two-phase train-boosting strategy that helps Mask R-CNN achieved a better learning/prediction performance.
  - Improved the total accuracy from 83.44% to 90.43% while reduced the false-positive rate from 22.16% to 3.56% on a custom 40,000-image dataset.

Multi-level detector for pornographic content using CNN models July, 2020

- ***Huy Nguyen**, Khoi Nguyen, Loc Tran, Thien Nguyen, Duy Phan and Lung Vu* *Conference*
  RIVF International Conference on Computing and Communication Technologies *RIVF-2020*
  - Applied Yahoo's Open NSFW model as a coarse classification stage.
  - Developed sensitive body part detector using Mask R-CNN model for the fine recognition stage
  - Achieved the performance of 92.13% and 90.40% on NPDI-800 and NPDI-2k open dataset.

Research Experiences

- **Post-Graduation Research Assistant** July, 2019 - Present
  ***Advisor**: Assoc. Prof. Duc-Lung Vu* *Faculty of Computer Engineering, UIT*
  - **Literature review**: Summarised and analysed papers for research topic (pornography visual classification, object detection, ensemble learning, vision transformer)

- **Data processing**: Assisted in developing large-scale visual dataset for pornography recognition. Collected, annotated, analysed and evaluated data.
- **Object detection/segmentation**: Worked with Mask R-CNN for sexual organs detection and segmentation. Developed a two-phase training strategy for boosting Mask R-CNN training performance. Developed a semi-automatic annotating tool for large-scale labeling (with a finer, more detailed mask).
- **Skin extraction**: Developed skin segmentation with color spaces method (on HSV, YCbCr). Combined with facial landmark algorithm to calculate body skin area on image.
- **Website content crawler**: Developed website image and textual content crawler using Python.
- **Other**: Preliminary experimented with attention-based transformer models for image/video classification.
- ***Skill obtained:*** papers reviewing, summarizing and writing; academic writing; research proposal writing; data collecting, processing, analysing and evaluating; LaTeX; Deep Learning framework (PyTorch, TensorFlow.)

- **Graduation Thesis: Detection and classification on sensitive visual content** August - December, 2019
  ***Advisor**: Assoc. Prof. Duc-Lung Vu* *Faculty of Computer Engineering, UIT*
  - ***Thesis score***: 9.6/10
  - Initial filtering with facial landmarks algorithm on OpenCV and skin extraction on color spaces.
  - Eventual determination with sexual organs detection using Mask R-CNN.
  - Achieved the accuracy of 83.75%, 85.50% and 87.50% in classification on open datasets NPDI-800, NPDI-2k and a custom 40,000-image dataset.
  - ***Skill obtained***: independence working, code managing, project managing, data evaluating, thesis writing.

Relevant Courses

- **Deep Learning Specialization** August 20th, 2021
  Prof. Andrew Ng *DeepLearning.AI, Coursera*
- **Writing in the Sciences** July 29th, 2021
  *Prof. Kristin Sainani; Certificate with **honor*** *Stanford University, Coursera*
- **Machine Learning** June 18th, 2021
  Prof. Andrew Ng *Stanford University, Coursera*

Honors and Extracurricular Activities

- **UIT Office of Excellent Programs Scholarship – Full Scholarship** Fall 2019
  Office of Excellent Programs – University of Information Technology
- **UIT Encouraging Scholarship** Fall 2018 and 2019
  Office of Student Affairs – University of Information Technology
- **Science Camp: Artificial Intelligence: Fundamental & Application** October 21st - 23rd, 2019
  Danang University of Science and Education – Japanese Advanced Institute of Science and Technology
- **Samsung Collegiate Programming Cup (SCPC) 2019** June 21st - July 6th, 2019
  Up to round 2
- **Summer Course: An Introduction to Machine Learning** June 17th - 21th, 2019
  Ho Chi Minh City University of Science – North Carolina State University
- **Samsung Collegiate Programming Cup (SCPC) 2018** June 23rd - July 7th, 2018
  Up to round 2

Technical Skills

- **Programming languages**: C++, Python
- **Technologies**: PyTorch, TensorFlow, NumPy, LaTeX