Hung Tran

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PROFESSIONAL PROFILE

- Ph.D. student in Computer Vision, Video Understanding, Human Behavior Understanding, Deep Learning.
- Solid background in Image Processing, Deep Learning, Machine Learning, Large Language Model (LLM).
- Industrial experiences in distributed web-based systems. Proficiency in Python and deep learning frameworks.
- Exceptional team member with a 3-year HDR Representative tenure and a top ranking in 3MT Presentation Challenge.
- Research interest: Human behavior understanding in videos, Video understanding, Knowledge Extraction from LLMs.

EDUCATION

Applied Artificial Intelligence Institute (A2I2), Deakin University, Ph.D., Computer Science **Jan 2020 – Present**
Has been serving as the Higher Degree Research (HDR) Student representative since 2021
Thesis: Light-weight Deep Learning model for Human Segmentation
Advisors: Dr. Vuong Le, A/Prof. Truyen Tran, Prof Svetha Venkatesh

Danang University of Science and Technology, Bachelor, Information Technology **May 2014 – May 2019**
Graduation classification: Very Good. GPA: 8.44 / 10 - Top 10%

SKILLS

Programming Languages: Python - Over 5 years of experience, Other: C/C++, JS, NodeJS, MongoDB.
Libraries: PyTorch, HuggingFace, Networkx, Numpy, Pandas, OpenCV, Matplotlib, Numpy.
Embedded Computing Boards: NVidia Jetson TK1, Nvidia Jetson TX2, TurtleBot.
Other: AWS, Google Cloud, Git, Docker, Slurm, Distributed Computing.

INDUSTRIAL EXPERIENCE

Software developer intern (Full-stack) **Sep 2018 - Jan 2019**
Sioux High Tech Software Ltd

- Implemented a Restful API using Node.js and MongoDB for a remote educational system. Created a user-friendly web and app interface with React.js and React Native.
- Deployed the system on Amazon AWS EC2 instances, utilizing Docker for containerization and S3 storage. The system was deployed on AWS clusters in Singapore, China, and The U.S.
- Defined the unit-testing infrastructure and back-up scenarios for the system.
- *Outcome*: A remote educational system with distributed servers that supports real-time class booking, online video-teaching from different places in the world.

PROJECTS

Human Behavior Understanding in Videos **2020 - Present**

- Experienced in handling large video datasets. Expertise in distributed computing, demonstrated by proficient use of the NVIDIA NCCL library and the Ray framework.
- Fine-tuned and Incorporated cutting-edge computer vision and multi-modal deep learning models such as ViT, MviT, DETR, CLIP, BLIP, Open flamingo.
- Explored different variants of LLMs, spanning across different scales (7B-65B) and precision (32bit-4bit). Explored methods for efficiently fine-tuning and incorporating LLMs into existing systems.
- *Outcome*: 3 Accepted papers, 1 on-going project.

Library for Loading and Using Large Language Model **2023**

- Developed a collection of open-source large language models. Built a library for loading these models on different hardware and settings. The library can provide API endpoints akin to OpenAI API, facilitating compatibility of the loaded models with existing LLM applications.
- *Outcome*: A library for utilizing LLMs that is used among fellow researchers in A2I2.

Affordable Mini Autonomous Vehicle **2019**

- Developed an affordable mini autonomous vehicle for university education, inspired by the existing F1TENTH model. Achieved a significant cost reduction for building the mini autonomous car, *bringing*

the cost from 4,200$ to under 2000$. Programmed the self-driving capabilities on the Jetson TX2 board using PyTorch and OpenCV.
- *Outcome*: Successful creation of an affordable mini autonomous vehicle

Light-weight Deep Learning model for Human Segmentation. **2019**
- Studied and developed a deep-learning architectures to segment human images from the scene for non-GPU hardware.
- *Outcome*: achieved the speed of 12 FPS when running on a personal non-GPU laptop.

Web-Crawling University of Danang Staff Data. **2017**
- Implemented a Web-Crawler to gather research publications, books, and articles authored by the University of Danang's staff members. Processed and organized the acquired data into a dedicated SQL database system. Built a tool that create a report from the acquired data.
- *Outcome*: an automated tool for collecting research records and creating reports.

RESEARCH

Applied Artificial Intelligence Institute (A2I2), Deakin University. **Jan 2020 - present**
Research theme: Human behavior understanding in videos.
- Designed a dual-stream, hierarchical model for capturing human intention in predicting future trajectories of pedestrians. The goals of pedestrians were detected from the scene images in an unsupervised manner. *Got 1 paper accepted at WACV 2021.*
- Designed a Graph Neural Network (GNN) for modeling the human adaptability to both long-term and short-term contexts during interactions with the surroundings. Applied this architecture for trajectory and motion prediction. *Got 2 paper accepted at CVPRW 2022, ICCV 2023.*
- Studying methods for probing the commonsense knowledge about human behavior from LLMs and use that to improve the performance of current video models. Exploring strategies to maintain a practical inference speed when incorporating LLMs into video models. *Ongoing project*.

Danang University of Science and Technology. **June 2018 - June 2019**
- Programmed on the Jetson TK1 to control a 1/10 scale autonomous vehicle. This involves processing images, tracking lane lines, detecting and recognizing traffic signs, and planning for navigation while avoiding obstacles. *Advanced to top 8 in a national competition*.
- Studied the features and the imbalance problem of the software fault data to improve the predictive performance of software fault prediction model. *Got 1 paper accepted at KSE 2019.*

PUBLICATIONS

- **Hung Tran**, Vuong Le, Svetha Venkatesh, and Truyen Tran. *"Persistent-Transient Duality: A Multi-Mechanism Approach for Modeling Human-Object Interaction*." Proceedings of The International Conference on Computer Vision (ICCV), 2023.
- **Tran, Hung,** et al. "*Persistent-Transient Duality in Human Behavior Modeling*." Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops. 2022.
- **Tran, Hung**, Vuong Le, and Truyen Tran. "*Goal-driven Long-Term Trajectory Prediction*." Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2021.
- **Tran, Hung Duy**, LE Thi My Hanh, and Nguyen Thanh Binh. "*Combining feature selection, feature learning and ensemble learning for software fault prediction*." 2019 11th International Conference on Knowledge and Systems Engineering (KSE). IEEE, 2019.

SCHOLARSHIPS AND AWARDS

Deakin University Postgraduate Research Scholarship. **2020 – Present**
People's choice Award, Three Minute Thesis Competition, A2I2. **2023**
Top 8 nationwide, Digital Race Driverless: Self-driving car competition, FPT Group, Vietnam. **2018**

REFERENCES

- **Dr. Vuong Le,** Amazon - Email: vuongle2@gmail.com
- **A/Prof. Truyen Tran,** Applied Artificial Intelligence Institute - Email: truyen.tran@deakin.edu.au
- **Prof Svetha Venkatesh,** Applied Artificial Intelligence Institute - Email: svetha.venkatesh@deakin.edu.au