# 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.
- Efficient team member with strong verbal and communication skills.
- Research interest: Human behavior understanding in videos, Knowledge Extraction from LLMs, Improving the efficiency of 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, Numpy, Pandas, OpenCV, Matplotlib, Numpy.
**Embedded Computing Boards:** NVidia Jetson TK1, Nvidia Jetson TX2, TurtleBot.
**Other:** AWS, Google Cloud, Git, Docker, Slurm, Distributed Computing.

## RESEARCH

**Applied Artificial Intelligence Institute (A2I2), Deakin University.**  **Jan 2020 - present**
Research theme: Human behavior understanding in videos.

- Incorporated Slurm to access GPU resources. Experienced in handling large video datasets. Expertise in distributed computing, demonstrated by proficient use of the NVIDIA NCCL library and the Ray framework.
- 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 CVPR Workshop 2022, ICCV 2023.*
- Studying methods for probing the commonsense knowledge about human behavior from LLMs and use that to improve the performance of current motion prediction models. Exploring strategies to maintain a practical inference speed when incorporating LLMs into these motion prediction 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.*

## 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

### 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.

## 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