Minh Tran

Google Scholar ⋄ trqminh.github.io
Github ⋄ minhtranquangcr@gmail.com

RESEARCH INTERESTS	Amodal Perception (AISFormer, ShapeFormer, AISDiff), Text-guided Generation (TextGuidecVAC); Video Segmentation and Tracking (A2VIS); AI for AgriTech (CarcassFormer); AI for Energy (S3Former).

EDUCATION

University of Arkansas, Fayetteville, AR
Ph.D. in Computer Science (Advisor: Ngan Le)   *Aug 2021 - Present*

University of Science, VNU-HCM
B.Sc. Honors in Computer Science   *Sep 2016 - Oct 2020*

RESEARCH EXPERIENCE

AICV Lab, University of Arkansas
Graduate Research Assistant   *Aug 2021 - Present*

- *Amodal Completion*:
  - Developed a video amodal completion model and dataset, (TextGuidecVAC), designed to reconstruct objects as complete entities from videos, even when partially occluded. The model employs a diffusion-based approach with motion learning, trained on a proposed synthetic dataset generated from video object segmentation datasets.
- *Image Segmentation*:
  - Developed amodal instance segmentation modelscapable of predicting the full shape of objects, including occluded region. Various models with different technique has been developed: Transformer (AISFormer, BMVC'22), Shape Priors Modeling (ShapeFormer, IJCNN'24), Diffusion Models: (AISDiff, ACCV'24). These models achieved state-of-the-art performance on amodal benchmarks such as KINS and COCOA.
- *Multiple object tracking and segmentation*:
  - Developed (A2VIS), a multiple-object tracking and segmentation model that integrates amodal segmentation capabilities to enhance tracking robustness. The model outperforms state-of-the-art methods in both object tracking and video amodal segmentation.
- *AI for Energy:*
  - Developed a high-resolution segmentation framework (SolarFormer, SGSMA'24) and a self-supervised learning technique (S3Former, IEEE Smart Grid for photovoltaic solar profiling.
- *AI for AgriTech:*
  - Developed a deep-learning framework for automated chicken assessment, capable of detecting and evaluating carcass quality (CarcassFormer, Poultry Science Journal). The framework is currently being deployed with Cobb Vantress, Inc., with the potential to automate quality control processes in poultry manufacturing.
  - Lead a five-people team (2 master and 3 undergraduate students) to develop a gait monitoring system (GaitEst) for a small-sized pen housing multiple chickens. The system detects birds and their pose, tracks them over time, and estimates their gait scores. The system is delivered to Cobb Vantress, Inc., with the potential to automate chicken legs disease detection.
- *Medical Imaging:*
  - Developed a medical image segmentation approach using a hybrid convolution-capsule network (3DConvCaps, ICPR'22) and a self-supervised learning technique for medical image segmentation on low-label datasets (SS-3DCapsNet, ISBI'22).

AIOZ AI
Research Engineer   *Aug 2020 - Aug 2021*

- Indoor Delivery Robot: Developed algorithms for localization module of an indoor self-delivery robot (BeetleBot). The robot won runner-up at Qualcomm Innovation Challenge 2021.
- Medical Imaging: Developed a light-weight model (LDR-ALDK) for medical image registration. One paper got accepted at Transactions on Medical Imaging

OPEN SOURCE PROJECTS

AIStron: Amodal Instance Segmentation Toolbox and Benchmark
Developing AIStron, an open-source toolbox that provides implementation of current Amodal Instance Segmentation (AIS) methods and benchmarks.

TECHNICAL SKILLS

Amodal Completion, Inpainting, Virtual Try-on, Segmentation, Multiple Object Tracking and Segmentation, Transformer, Stable Diffusion, Diffusers, Detectron2, Pytorch Lightning, Hugging Face

PUBLICATION	**Journal Papers**	

Journal Papers

1. **Minh Tran**, Adrian De Luis, Haitao Liao, Ying Huang, Roy McCann, Alan Mantooth, Jack Cothren, and Ngan Le. S3Former: A Deep Learning Approach to High Resolution Solar PV Profiling. *IEEE Transactions on Smart Grid*, 2025. (**Q1 Journal, Impact Factor 8.6**)

2. **Minh Tran**, Sang Truong, Arthur FA Fernandes, Michael T. Kidd, and Ngan Le. CarcassFormer: an end-to-end transformer-based framework for simultaneous localization, segmentation and classification of poultry carcass defect. *Poultry Science*, 2024 (**Q1 Journal**)

3. Taisei Hanyu, Kashu Yamazaki, **Minh Tran**, Roy A. McCann, Haitao Liao, Chase Rainwater, Meredith Adkins, Jackson Cothren, and Ngan Le. Aerialformer: Multi-resolution transformer for aerial image segmentation. *Remote Sensing*, 2024 (**Q1 Journal**).

4. **Minh Tran**, Tuong Do, Huy Tran, Erman Tjiputra, Quang D. Tran, and Anh Nguyen. Light-weight deformable registration using adversarial learning with distilling knowledge. *IEEE transactions on Medical Imaging*, 2022 (**Q1 Journal, Impact Factor 8.9**).

Conference Papers

5. **Minh Tran**, Khoa Vo, Tri Nguyen, and Ngan Le. Amodal Instance Segmentation with Diffusion Shape Prior Estimation. In *Proceedings of the Asian Conference on Computer Vision* (ACCV), 2024. (Rank A)

6. Khoa Vo, Thinh Phan, Kashu Yamazaki, **Minh Tran**, and Ngan Le. HENASY: Learning to Assemble Scene-Entities for Egocentric Video-Language Model. In *Conference on Neural Information Processing Systems* (Neurips), 2024. (Rank A*)

7. **Minh Tran**, Winston Bounsavy, Khoa Vo, Anh Nguyen, Tri Nguyen, and Ngan Le. Shapeformer: Shape prior visible-to-amodal transformer-based amodal instance segmentation. In *International Joint Conference on Neural Networks* (IJCNN), 2024.

8. Adrian De Luis, **Minh Tran**, Taisei Hanyu, Anh Tran, Liao Haitao, Roy McCann, Alan Mantooth, Ying Huang, and Ngan Le. "Solarformer: Multi-scale transformer for solar pv profiling." In *International Conference on Smart Grid Synchronized Measurements and Analytics* (SGSMA), 2024.

9. Kashu Yamazaki, Taisei Hanyu, Khoa Vo, Thang Pham, **Minh Tran**, Gianfranco Doretto, Anh Nguyen, and Ngan Le. "Open-fusion: Real-time open-vocabulary 3d mapping and queryable scene representation." In *IEEE International Conference on Robotics and Automation* (ICRA), 2024. (Rank A)

10. **Minh Tran**, Khoa Vo, Kashu Yamazaki, Arthur Fernandes, Michael Kidd, and Ngan Le. "Aisformer: Amodal instance segmentation with transformer." In *33rd British Machine Vision Conference* (BMVC), 2022. (Rank A)

11. **Minh Tran**, Khoa Vo, and Ngan TH Le. "3DConvCaps: 3DUnet with convolutional capsule encoder for medical image segmentation." In *26th International Conference on Pattern Recognition* (ICPR), 2022.

12. **Minh Tran**, Loi Ly, Binh-Son Hua, and Ngan Le. "Ss-3dcapsnet: Self-supervised 3d capsule networks for medical segmentation on less labeled data." In *IEEE 19th International Symposium on Biomedical Imaging* (ISBI), 2022. (Rank A). **Oral Presentation**

13. Anh Nguyen, Tuong Do, **Minh Tran**, Binh X. Nguyen, Chien Duong, Tu Phan, Erman Tjiputra, and Quang D. Tran. "Deep federated learning for autonomous driving." In *IEEE Intelligent Vehicles Symposium* (IV), 2022.

14. Tuong Do, Binh X. Nguyen, Erman Tjiputra, **Minh Tran**, Quang D. Tran, and Anh Nguyen. "Multiple meta-model quantifying for medical visual question answering." In *Medical Image Computing and Computer Assisted Intervention* (MICCAI), 2021. (Rank A)

Book Chapters

15. **Minh Tran**, Viet-Khoa Vo-Ho, Kyle Quinn, Hien Nguyen, Khoa Luu, and Ngan Le. CapsNet for medical image segmentation. In *Deep Learning for Medical Image Analysis*, 2024.

HONORS AND AWARDS		
University of Arkansas Graduate Assistantship		*2021-2026*
Department of Electrical Engineering and Computer Science Fellowship		*Jan 2025*
Asian Conference on Computer Vision International Travel Grant		*Dec 2024*
Conference on Computer Vision and Pattern Recognition DEI Award		*June 2024*
Rodger S. Kline Chair Graduate Scholarship		*Jan 2023*
Reginald R. "Barney" & Jameson A. Baxter Graduate Fellowship		*Aug 2022*

TEACHING EXPERIENCE		
CSCE 4133: Algorithms, University of Arkansas, *Teaching Assistant*		*Fall 2023*
CSCE 4613: Artificial Intelligence, University of Arkansas, *Teaching Assistant*		*Fall 2024*
NACME Google AMLI Summer Program, *Teaching Assistant*		*Summer 2022*

ADVISING EXPERIENCE

Master Thesis Advising, "Deep Learning for Photovoltaic Characterization", Adrian de Luis

Master Thesis Advising, "Chicken Gait Estimation", Annie Prasana

B.Sc. Honors Thesis Advising "Poultry Pose Estimation with DeepLabCut", Chiyou Vang

B.Sc. Honors Thesis Advising "Chicken Keypoint Estimation", Rohit Kala

B.Sc. Honors Thesis Advising "Video Amodal Perception", Winston Bounsavy

PROFESSIONAL SERVICES

Conference Reviewer at ICCV, CVPR, ACCV, MICCAI, IJCNN

Journal Reviewer at IEEE Transactions on Medical Imaging, Image and Vision Computing