VAN-TUAN TRAN

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RESEARCH INTERESTS

Modular Deep Learning, Federated Learning, Local Learning, Trustworthy AI

EDUCATION

PhD. Computer Science   **Trinity College Dublin (TCD), Ireland**
Doctor of Philosophy   *Sep 2023 - Present*
- Research topic: Towards Collective Intelligence at the Edge with Adaptive Federated Learning.

BEng. Telecommunications Engineering   **Ho Chi Minh City University of Technology (HCMUT), Vietnam**
Bachelor of Engineering   *2015 - 2019*

PUBLICATIONS

Think Twice before Adaptation: Improving Adaptability of DeepFake Detection via Online Test-Time Adaptation
Co-author   *International Joint Conference on Artificial Intelligence (IJCAI)*, *2025*
- Propose a novel test-time adaptation framework using uncertainty estimation for robust deepfake detection under distribution shift as inference time.

Revisiting Sparse Mixture of Experts for Resource-adaptive Federated Fine-tuning Foundation Models
Co-first author   *ICLR Workshop on Modular, Collaborative, and Decentralized Deep Learning (MCDC@ICLR)*, *2025*
- Propose a novel method for federated fine-tuning foundation models under system heterogeneity using the self-slimmability of Sparsely-activated Mixture-of-Experts.

ToFU: Transformation-guided Federated Unlearning
First author   *Under-review, European Conference on Artificial Intelligence (ECAI)*, *2025*
- Introduce ToFU, a paradigm shift in federated unlearning by incorporating data transformations during the learning phase, forcing models to learn invariant features, simplifying the unlearning process.

pFedDSH: Enabling Knowledge Transfer in Personalized Federated Learning through Data-free Sub-Hypernetwork
Co-author   *Under-review, International Conference on Computer Vision (ICCV)*, *2025*
- Propose a personalized federated learning framework using Hypernetworks to facilitate forward (old-to-new) and backward (new-to-old) knowledge transfer, targeted to new clients integration.

D-CAPTCHA++: A Study of Resilience of Deepfake CAPTCHA under Transferable Imperceptible Adversarial Attack
Co-author   *International Joint Conference on Neural Networks (IJCNN)*, *2024*
- Propose a resilient challenge-response protocol framework for audio against transferable imperceptible adversarial attacks.

Personalized Privacy-Preserving Framework for Cross-silo Federated Learning
First author   *IEEE Transactions on Emerging Topics in Computing (TETC)*, *2024*
- Propose a personalized Federated Learning framework to collaboratively learn a meta, global model from DP-guaranteed data that can be efficiently adapted to local, heterogeneous data.

Learning From Multiple Expert Annotators for Enhancing Anomaly Detection in Medical Image Analysis
Co-first author   *IEEE Access*, *2023*
- Propose an approach to enhance efficiency in Radiological abnormal detection tasks by estimating hidden labels from multiple expert annotators and using a re-weighted loss function.

WORKING EXPERIENCE

Data Scientist   **Vietnam**
AI Lab, MTI Technology Vietnam   *Jan 2022 - Aug 2023*
AI-Robotics Platform for Remote Hand Palpation: The project's goal is to build a point-of-care hand palpation system.

- Technical leader of a 3-member team, in charge of analysing data and building DL-based algorithms for 3D hands modeling and keypoints analysis.

Research Assistant   **Vietnam**
VinUni-Illinois Smart Health Center, Vin University   *Jan 2022 - July 2022*
Personalized Privacy-Preserving Federated Learning: The project aims at concurrently protecting privacy and solving the heterogeneous problems of the users' data in Federated Learning.

- First author of a journal paper at IEEE Transactions on Emerging Topics in Computing.

Research Intern   **Vietnam**
Medical Imaging Center - Vingroup Big Data Institute   *Oct 2020 - Nov 2021*
Learning from multiple annotators: Improving the anomaly detection performance on chest radiographs using multiple expert annotations.

- Co-first author of a journal paper at IEEE Access.

MRI Pulse Sequence Classification: The project objective is recognizing and classifying brain MRI scans into different pulse sequence types

- Core member of the team, in charge of building Deep Learning (DL) models and packaging the solution into an open package.

Side projects: Time-series Forecasting; Receipt OCR; Multimodal Learning

- Technical leader of a 4-member team, in charge of formulating problems, building ML models, and deploying the solutions into web apps.

Machine Learning Engineer   **Vietnam**
CBD Robotics   *Sep 2020 - Jan 2021*
Lung Cancer Diagnosis: A DL-based solution for Lung Cancer Diagnosis from CT scans.

- Core member of the team, in charge of building DL models and deploying them via REST API with flask.

Machine Learning Engineer   **Vietnam**
CB/I Digital Inc.   *Sep 2019 - Oct 2020*
Automated Campaign Management: The project focuses on building a B2B SaaS product helping marketers to automate the budget allocation and keywords bidding tasks in digital marketing campaigns.

- Core member of the team, in charge of analyzing data and building time-series forecasting models.

Workout Analysis: An advanced feature of a Virtual Mobility Coach solution that applies Pose Estimation techniques for analysing workout poses to avoid bad postures and injuries.

- Core member of the team, in charge of building DL models for skeleton-based pose estimation.

Facial Analysis: an advanced feature that leverages Facial Analysis techniques in eKYC a social platform.

- Technical leader of a team of 3 members, in charge of building face verification and facial attributes analysis algorithms.

AWARDS

European Statistics Awards, Web Intelligence - Classification Challenge   **2024**
Runner-up.

- Leader of the *FVNWL* team of 4 members.
- Propose an LLMs-based retrieval solution for ISCO classification of job advertisements.

UCC AI Quest 2023   **2023**
First Prize.

- Leader of the *FSGWL* team of 3 members.
- Propose a DL-based solution for semantic segmentation of Irish aerial images.

MTI Technology - AI & Agile Hackathon   **2023**
Good Ideas Prize.

- Leader of the *Symbol/Connect* team of 5 members.
- Propose a firewall inspired by Symbolic AI to prevent hijacking via prompt injection in the era of LLMs in Software Development.

ACTIVITIES

Postgraduate Demonstrator   **Ireland**
School of Computer Science and Statistics, Trinity College Dublin   *Spring semester, 2024*
CSU11001 - Mathematics I.

Postgraduate Demonstrator   **Ireland**
School of Computer Science and Statistics, Trinity College Dublin   *Fall semester, 2024*
CS7CS4 - Machine Learning.

Teaching Assistant   **Vietnam**
BKtel ML and IoT Lab, Ho Chi Minh University of Technology   *Fall semester, 2020*
ML Course: Fundamental Machine Learning course for undergrad students.

- Prepare teaching materials.
- Give talks about recent advances of Deep Learning in Computer Vision and Natural Language Processing.

SKILLS

Languages	Vietnamese - *native*, English - *IELTS: 7.0*
Programming Languages	Python, C, MATLAB
Tools	PyTorch, Keras, TensorFlow, sci-kit learn, git, flask, docker