Tat-Chuyen Mai

AI Researcher — Specializing in Computer Vision and Deep Learning

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Career Objective

Dedicated AI researcher with four years of experience in developing and optimizing deep learning architectures for image segmentation, visual understanding, and multimodal learning. Strong background in computer vision, with hands-on experience in coding, training, and fine-tuning deep learning models using Python on NVIDIA RTX 3090 GPUs. Eager to apply advanced vision-based AI techniques to automation systems, focusing on building reliable and efficient models that bridge the gap between perception and intelligent decision-making in real-world environments.

Education

Hanoi University of Science and Technology (HUST) ***Sep 2021 – Sep 2025***
Bachelor of Advanced Program in Biomedical Engineering

- GPA: **3.72/4.00**
- Academic Excellence Scholarship
- Best Graduation Project
- 2nd Prize (School) & 3rd Prize (University) – HUST Annual Student Research Conference 2024–2025

Publications

• **Inception Vision Mamba Unet for Tumor Segmentation on Breast Ultrasound Images**
Tat-Chuyen Mai, Viet-Dung Nguyen* - Springer Nature
Developed the Vision Mamba U-Net architecture integrating multi-scale feature learning from Inception modules, achieving a 3% improvement in segmentation accuracy on breast ultrasound datasets.

• **Motion Analysis & Performance Monitoring System for Squat Exercise by Simple Estimation**
Nguyen Phan Kien*, ***Mai Tat Chuyen***, Trinh Khanh Ly, Ong Thi Huyen Trang, Nguyen Trung Phu, Nguyen Thanh Hai, Nguyen Thuy Anh, Tran Duc Tan - ICISN 2025
Proposed a lightweight algorithm using MediaPipe for real-time human pose extraction and joint-angle estimation in motion analysis applications.

• **Multimodal Deep Learning for Breast Ultrasound Lesion Classification**
Tat-Chuyen Mai, Khanh-Ly Trinh, Huyen-Trang Ong, Hai-Long Nguyen, Viet-Dung Nguyen* - ICHST 2025
Developed a multimodal deep learning framework integrating image and metadata representations to enhance classification of breast ultrasound lesions.

Experience

Research Assistant
Biomedical Signal and Image Analysis Laboratory (BSI), HUST

- Conducted research on **AI-based breast ultrasound image analysis**, focusing on tumor segmentation and lesion classification.
- Optimized deep learning architectures (Vision Mamba U-Net, multimodal models) for robust visual analysis and model generalization.
- Explored multimodal fusion techniques combining image and auxiliary metadata to enhance classification performance.

- Led a small research team, managed experimental pipelines, and contributed to multiple peer-reviewed publications.
- Trained large-scale vision models on NVIDIA RTX 3090 GPU with optimized CUDA pipelines for efficient performance.
- Skills: PyTorch, Python, Deep Learning, Image Segmentation, Model Optimization, Scientific Writing.

Software Engineer Intern
Motion Analysis Lab, Vinmec Times City International Hospital

- Developed a Python-based **motion analysis and visualization system** integrating data from multiple camera-based measurement tools; **currently used by doctors (Vinmec)** for clinical evaluation.
- **Project code** and description details available at: Project Page
- Collaborated with a multidisciplinary team of doctors and engineers to optimize performance and usability for clinical workflows.
- Skills: Python, OpenCV, Data Processing, Motion Analysis, GUI Development.

Skills

- **Programming:** Python, C/C++
- **AI & ML Frameworks:** PyTorch, TensorFlow, Scikit-learn
- **Data Processing & Visualization:** NumPy, Pandas, Matplotlib
- **Tools & Systems:** Git, VS Code, Jupyter, LaTeX, Linux, Windows, CUDA
- **Language:** English (VSTEP B2)

Computer Vision and Deep Learning Expertise

- **Deep Learning:** CNNs, UNet, Vision Transformer, Mamba models
- **Multimodal Learning:** Cross-modality fusion, Attention-based integration
- **Image Processing:** Edge Detection, Denoising, Feature Extraction, Filtering, and Enhancement
- **Generative Vision Models:** Diffusion Models

Online Certifications

- Google Advanced Data Analytics Professional Certificate – Coursera
- Machine Learning Specialization – Coursera
- AI for Medicine Specialization – Coursera

Professional Activities

- **Reviewer**, IEEE CIBCB 2025 – 22nd IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology.
- Reviewed 4 manuscripts, evaluating scientific validity, methodology, and relevance in computational biology.

Referees

Dr. Viet-Dung Nguyen, School of Electrical and Electronics Engineering, HUST
• Google Scholar • Email: dung.nguyenviet1@hust.edu.vn