Vi Vu

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Research Interests

My research interests lie in **Computer Vision** for **Medical AI**, with a focus on mathematically grounded modeling and foundation-model–driven designs. I have extensive experience in **learning with imperfect & limited annotations**, particularly in semi/unsupervised learning, transfer learning, and deep multimodal learning under domain discrepancy and low-quality labeling scenarios.

Education

Ho Chi Minh City University of Technology *Sep 2021 – Nov 2025*
B.E. in Computer Engineering (High-Quality Program) HCMC, Vietnam

- **GPA:** 9.27/10.0 (3.9/4.0) [Transcript]
- **Ranked #1** in Department of Computer Science and Engineering

Professional Experience

Xu Lab - Carnegie Mellon University *Aug 2024 - Present*
Research Assistant Pennsylvania, USA

- Advisors: Prof. Min Xu, Dr. Xingjian Li and Prof. Tianyang Wang
- Implemented a Mixture-of-Experts framework to cope with homogeneity problem in semi-supervised setting in project "Semi-MoE: Mixture of Experts meets Semi-supervised learning".
- Leading "SemiSAM", developing a co-training framework between foundation and conventional networks for semi-supervised medical image segmentation.
- Assisting project "Bridging multiple domain shifts in mixed-domain medical image segmentation".
- Supported professor in drafting peer-review feedback for conference papers (e.g., IJCAI, MICCAI).

Machine and Hybrid Intelligence Lab - Northwestern University *Jun 2025 - Present*
Research Assistant Illinois, USA

- Advisor: Prof. Ulas Bagci
- Developed a mean-teacher framework to disentangle stain appearance vs. tissue structure for histopathology segmentation under limited annotations and significant H&E variability.
- Assisting project "Source-free domain adaptation in medical image segmentation".

AIVIETNAM *May 2024 - Present*
Research Associate, Teaching Assistant HCMC, Vietnam

- Advisors: Dr. Quang Vinh Dinh
- Co-Lead of AIMA: AI-in-Medicine Applications, leading 4 teams in Medical AI.
- Providing academic support for 600+ students in the All-in-One 2024 course and hosting online seminars on semi-supervised learning and knowledge distillation.

Integrated MechanoBioSystems Lab - National Cheng Kung University *Jul 2025 - Sep 2025*
AI Research Intern Tainan, Taiwan

- Advisor: Ting-Yuan Tu
- Developed a Y-Net Siamese architecture for fast 3D single-cell tracking and segmentation in 3D time-lapse images.

FPT Software AI Center - FPT Corporation *Jun 2024 - Sep 2024*
AI Researcher Hanoi, Vietnam

- Advisor: Prof. Anh Nguyen
- Applied denoising diffusion implicit models (DDIM) for interactive 3D editing in "DragPC – point cloud shape deformation via latent point diffusion models" project.
- Hosted weekly seminar sessions on diffusion, 3D Gaussian splatting, and large vision models.

Publications

C=Conference, J=Journal, S=In Submission

[C.1] **Semi-MoE: Mixture-of-Experts meets Semi-Supervised Histopathology Segmentation**
Vi Vu*, TH Nguyen*, HT Nguyen, D Kihara, T Wang, X Li, M Xu
BMVC - British Machine Vision Conference (2025). [PDF].

[C.2] **Semi-Supervised Histopathology Image Segmentation with Feature Diversified Collaborative Learning**
Vi Vu*, TH Nguyen*, HT Nguyen, QV Dinh, X Li, M Xu
AAAI Bridge Program - AI for Medicine and Healthcare Bridge program (2025). [PDF].

[C.3] **HDC: Hierarchical Distillation for Multi-level Noisy Consistency in Semi-Supervised Fetal Ultrasound Segmentation**
Vi Vu*, TQK Le*, HH Pham, XL Huynh, TH Nguyen, MHN Le, Q Nguyen, HD Nguyen
CVPRW - The 7th IEEE/CVF CVPR Precognition Workshop (2025). [PDF].

[C.4] **Learning Disentangled Stain and Structural Representations for Semi-Supervised Histopathology Segmentation**
Vi Vu*, HH Pham*, TH Nguyen, U Bagci, M Xu, TN Le, HH Pham
COMPAYL - MICCAI Workshop on Computational Pathology with Multimodal Data (2025). [PDF].

[C.4] **Semi-Supervised Skin Lesion Segmentation under Dual Mask Ensemble with Feature Discrepancy Co-Training**
TH Nguyen, T Nguyen, XB Nguyen, **Vi Vu**, VQ Dinh, F MERIAUDEAU
MIDL - Medical Imaging with Deep Learning (2025). [PDF].

[C.6] **Fetal-BCP: Addressing Empirical Distribution Gap in Semi-Supervised Fetal Ultrasound Segmentation**
HH Pham, HT Nguyen, **Vi Vu**, QV Dinh, TH Nguyen, X Li, M Xu
ISBI - IEEE 22nd International Symposium on Biomedical Imaging (2025). [PDF].

[C.7] **Hepatic Tumor Segmentation under Modified Scalable and Transferable nnU-Net Framework**
TQK Bui, M. Dinh, **Vi Vu**, Q. Nguyen, Q. Dinh, M. Le, Q. Le
CITA - Conference on Information Technology and its Applications (2025). [PDF].

[J.1] **Performance analysis of artificial intelligence–driven convolutional neural network architectures for liver tumor segmentation**
MHN Le, TH Nguyen, MT Dinh, TQK Bui, **Vi Vu**, HQ Kha, PK Nguyen, NHH Le, TM Nguyen, HH Huynh, K Le
Journal of Clinical Oncology (IF 42.1) (2025). [PDF].

[J.2] **DuetMatch: Harmonizing Semi-Supervised Brain MRI Segmentation via Decoupled Branch Optimization**
TH Nguyen, HT Nguyen, **Vi Vu**, BT Lam, P Huynh, T Wang, X Li, U Bagci, M Xu
Computerized Medical Imaging and Graphics (IF 4.9) (2025). [PDF].

[S.1] **From Specialist to Generalist: Unlocking SAM's Learning Potential on Unlabeled Medical Images**
Vi Vu*, HT Nguyen*, TT Nguyen*, TB Lam, TH Nguyen, T Wang, X Li, M Xu
ISBI - IEEE 23rd International Symposium on Biomedical Imaging (2026). [PDF].

[S.2] **Adaptive Knowledge Transfering with Switching Dual-Student Framework for Semi-Supervised Medical Image Segmentation**
TH Nguyen, HT Nguyen, **Vi Vu**, BT Lam, BX Nguyen, J Xing, T Wang, X Li, M Xu
Pattern Recognition Journal (IF 7.6) (2025). [PDF].

[S.3] **Domain-Invariant Mixed-Domain Semi-Supervised Medical Image Segmentation with Clustered Maximum Mean Discrepancy Alignment**
TH Nguyen, BT Lam, Thien Nguyen, TQK Bui, **Vi Vu**, KP Huynh, U Bagci, M Xu
ICASSP - International Conference on Acoustics, Speech, and Signal Processing (2026). [PDF].

[S.4] **Aligning What You Separate: Denoised Patch Mixing for Source-Free Domain Adaptation in Medical Image Segmentation**
T Nguyen, TH Nguyen, TQK Bui, BT Lam, **Vi Vu**, KP Huynh, , U Bagci, M Xu
ICASSP - International Conference on Acoustics, Speech, and Signal Processing (2026). [PDF].

[S.5] **UP2D: Uncertainty-aware Progressive Pseudo-label Denoising for Source-Free Domain Adaptive Medical Image Segmentation**
TQK Bui, T. Nguyen, D. Ho, B. Lam, **Vi Vu**, T. Nguyen, P. Huynh, U. Bagci
Journal of Biomedical and Health Informatics (IF 6.8) (2026). [PDF].

Honors and Awards

Winner of the Fetal Ultrasound Grand Challenge at ISBI in Texas, USA [Cert]

NSTC Scholarship for International Internship Pilot Program in Tainan, Taiwan [Cert]

Achieve outstanding Academic Performance certification in HCMC, Vietnam [Cert]

1st Prize, City-level Excellent Physics Student in HCMC, Vietnam [Cert]

Momentum Scholarship (top 10 university students) in HCMC, Vietnam

4 Academic Incentive Scholarships Type 1 (top 1.6% of university students) in HCMC, Vietnam

2 OISP Scholarships Type 1 for high-quality English-taught programs in HCMC, Vietnam

Achieve the title of Outstanding All-around Student in HCMC, Vietnam