

BINH NGUYEN

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RESEARCH SUMMARY

Acoustic Reasoning-Centric Post-Training (GRPO) | Multimodal Reasoning | Modality Disentanglement & Model Steering | Adversarial Robustness | Audio Deepfake Detection

EDUCATION

- Indiana University Bloomington** Aug 2026 - Present
Ph.D. in Computer Science
◦ **Advisor:** Prof. Thai Le | **Lab:** [ARKAI Lab](#)
◦ **Focus:** Cross-modal adversarial vulnerability and reasoning shifts in audio-language foundation models.
- University of Science - Vietnam National University (VNU-HCM)** 2017 - 2021
B.S. in Computer Science Ho Chi Minh City, Vietnam
◦ **Thesis:** Deep Learning Architectures for Low-Resource Neural Machine Translation

PUBLICATIONS

- Binh Nguyen**, Charles Fleming, and Thai Le, et al. (2026). [SARA: Stress Test Reasoning in Audio Deepfake Detection](#). In: Accepted to EMNLP Findings'26.
- Binh Nguyen**, Shuju Shi, Ryan Ofman, and Thai Le, et al. (2025). [What You Read Isn't What You Hear: Linguistic Sensitivity in Deepfake Speech Detection](#). In: EMNLP'25 Oral Presentation.
- Binh Nguyen**, Thai Le, et al. (2025). [TURING'S ECHO: Investigating Linguistic Sensitivity of Deepfake Voice Detection via Gamification](#). In: Interspeech'25.
- Binh Nguyen**, Long Nguyen and Dien Dinh, et al. (2022). [Multi-level Community-awareness Graph Neural Networks for Neural Machine Translation](#). In: COLING'22.
- Long H. B. Nguyen, **Binh Nguyen**, Binh Le, Dien Dinh, et al. (2023). [Exploring Graph-based Transformer Encoder for Low-Resource Neural Machine Translation](#). ACM Transactions on Asian and Low-Resource Language Information Processing (TALLIP).
- Binh Nguyen**, Binh Le, Long H.B. Nguyen, and Dien Dinh, et al. (2021). [PhraseAttn: Dynamic Slot Capsule Networks for phrase representation in Neural Machine Translation](#). In: Journal of Intelligent & Fuzzy Systems 2021.

WORK EXPERIENCE

- Med2Lab Inc** Nov 2022 – Mar 2026
AI Engineer Remote / Silicon Valley, CA
 - Healthcare Multi-Agent Simulation: Implemented clinical simulation engines powered by Large Language Models (LLMs) for patient/preceptor roleplay; drove cross-functional collaboration with medical experts across 4 institutions (Stanford Medicine, NUS Medicine, Samsung Medical Center, Weitzman Institute), accelerating diagnostic training workflows.
 - Clinical NLP & Information Extraction: Formulated domain-adapted fine-tuning of DeBERTa-v3 using **PyTorch** and Hugging Face **Transformers** on specialized clinical corpora for Named Entity Recognition and differential diagnosis extraction, achieving 72% top-1 accuracy on complex, unstructured clinical transcripts.
 - Enterprise Retrieval Systems: Built hybrid dense-sparse Retrieval-Augmented Generation (RAG) architectures integrating rerankers and contextual routing for medical documentation retrieval and clinical triage, maintaining 93% retrieval precision.
- OLLI Technology Corp** Aug 2021 – Dec 2022
AI Engineer Vietnam
 - Spoken Language Understanding (SLU): Trained joint Intent Classification & Slot Filling models using DeBERTa-v3 with constrained decoding for smart voice assistants; achieved 92% accuracy on core smart-home intents and 73% on nested multi-turn commands.
 - Open-Domain QA Architecture: Designed low-latency neural retrieval pipelines (dense bi-encoders + reranking) for high-volume conversational queries, attaining an 83% top-1 question resolution rate in production.

TECHNICAL SKILLS

- **Languages:** Python, SQL
- **Frameworks & Libraries:** PyTorch, transformers, peft, trl, vLLM
- **Research & Methodologies:** Modality Disentanglement & Model Steering, Post-Training Alignment (GRPO, PPO), Multimodal Reasoning, Adversarial Audio Deepfake Detection, Natural Language Processing
- **Tools/Infra:** Docker, Git, Linux, AWS
- **Natural Languages:** English (Proficient, IELTS 7.5), Vietnamese (Native)