Ngoc Bui

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RESEARCH INTERESTS

My research interests broadly include large language models (LLMs) and their applications, such as personalized assistants and synthetic data generation through simulations. I am also very interested in developing effective memory paradigms that enable LLMs to store and continually update their knowledge, which, I believe, is crucial for creating personalized and (multi-) agentic systems.

EDUCATION

- **Ph.D. in Computer Science** *2023 – 2028 [expected]*
  Yale University
  - Advisor: Prof. Rex Ying
- **M.S. in Data Science** *2021 – 2023*
  Hanoi University of Science and Technology (HUST)
  - GPA: 3.9/4.0, Major GPA: 4.0/4.0.
  - Thesis: Evolutionary and Deep Reinforcement Learning Algorithms for Optimizing the Lifetime of Wireless Sensor Networks.
  - Advisors: Prof. Thuan Do Phan and Dr. Phi Le Nguyen
- **Engineer in Computer Science** *2016 – 2021*
  Hanoi University of Science and Technology (HUST)
  - GPA: 3.67/4.0, Major GPA: 3.88/4.0.
  - Honors: Excellent ($\approx$ 1st class honors).

PUBLICATIONS

- **Ngoc Bui**, Hieu Trung Nguyen, Viet Anh Nguyen, and Rex Ying. "Explaining Graph Neural Networks via Structure-aware Interaction Index". The *International Conference on Machine Learning (ICML)*, 2024.
- **Ngoc Bui**, Duy Nguyen, Man-Chung Yue, and Viet-Anh Nguyen. "Coverage-Validity-Aware Algorithmic Recourse". The *Operations Research (OPRE) Journal*, 2024.
- Duy Nguyen, **Ngoc Bui**, Viet-Anh Nguyen. "Feasible Recourse Plan via Diverse Interpolation". The *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2023.
- Duy Nguyen, **Ngoc Bui**, Viet-Anh Nguyen. "Distributionally Robust Recourse Action". The *International Conference on Learning Representations (ICLR)*, 2023.
- **Ngoc Bui**, Tam Nguyen, Binh Huynh Thi Thanh, and Trong Vinh Le. "A phenotype-based multi-objective evolutionary algorithm for maximizing lifetime in wireless sensor networks with bounded hop". The *Journal of Soft Computing*, 2023.
- **Ngoc Bui**, Duy Nguyen, Viet-Anh Nguyen. "Counterfactual Plans under Distributional Ambiguity". The *International Conference on Learning Representations (ICLR)*, 2022.
- Tuan-Duy Hien Nguyen, **Ngoc Bui**, Duy Nguyen, Man-Chung Yue, Viet Anh Nguyen. "Robust Bayesian Recourse". The *Association for Uncertainty in Artificial Intelligence (UAI)*, 2022.
- **Ngoc Bui**, Phi Le Nguyen, Viet Anh Nguyen, Phan Thuan Do. "A Deep Reinforcement Learning-based Adaptive Charging Policy for WRSNs". The IEEE *International Conference on Mobile Ad-Hoc and Smart Systems (MASS)*, 2022.
- **Ngoc Bui** and Viet-Trung Tran. "A Novel Conditional Random Fields Aided Fuzzy Matching in Vietnamese Address Standardization". The *International Symposium on Information and Communication Technology (SoICT)*, 2019.

UNDER REVIEW

- **Ngoc Bui**, Hieu Trung Nguyen, Shantanu Kumar, Julian Theodore, Weikang Qiu, Viet Anh Nguyen, Rex Ying. "Mixture-of-Personas Language Models for Population Simulation". *Under Review*.
- Jiasheng Zhang, Jialin Chen, Ali Maatouk, **Ngoc Bui**, Qianqian Xie, Leandros Tassiulas, Jie Shao, Hua Xu, Rex Ying. "LitFM: A Retrieval Augmented Structure-aware Foundation Model For Citation Graphs". *Under Review*.
- Runjin Chen, Mingxuan Ju, **Ngoc Bui**, Dimosthenis Antypas, Stanley Cai, Xiaopeng Wu, Leonardo Neves, Zhangyang Wang, Neil Shah, Tong Zhao. "Enhancing Item Tokenization for Generative Recommendation through Self-Improvement". *Under Review*.

EXPERIENCES

- **Snap Inc.** *June 2024 - November 2024*
  Research Intern
  - Developing backward-compatible training techniques to improve performance and efficiency of large retrieval systems, particularly in the context of continual updates of the embedding models.
  - Advisor: Dr. Tong Zhao
- **VinAI Research** *August 2021 - July 2023*
  Research Resident
  - Focusing on robust & trustworthy ML, studying different paradigms of explanation methods for machine learning models and their robustness.
  - Advisor: Prof. Viet Anh Nguyen
  - Applied Rotation Project: Interactive Tool for 3D Point Cloud Segmentation.
- **Data Science Lab - HUST** *December 2019 - June 2020*
  Research Assistant
  - Studying the Vietnamese address standardization problem that recognizes and normalizes free-form addresses into a common standard format.
  - Advisor: Dr. Viet-Trung Tran
- **IBM Vietnam** *July 2019 - October 2019*
  AI Research Intern
  - Applying PowerAI Vision to visual inspection problems in the car manufacturing process to detect dirt, and dust defects in the car body after painting.
  - Advisor: Dr. Tam Le Nhan

AWARDS & HONORS

- Honorable Mention in INFORMS Undergraduate Operations Research Prize. *2022*
- Best Thesis Presentation Award. *2021*
- Problem Winner in ASEAN-India Hackathon. *2021*
- Third prize in Vietnam Olympiad in Informatics. *2016*

TEACHING

- Trustworthy Deep Learning, *Yale* *Spring 2024*
- Applied Algorithms classes, *HUST* *2019 - 2021*

PROFESSIONAL SERVICES

- Reviewer at AISTATS 2022/2023, FaCCT 2023, UAI 2023, NeuRIPS 2023/2024, ICLR 2024.
- Reviewer at ACM Transactions on Sensor Networks (TOSN).