Trang NGUYEN

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Education

Tokyo Institute of Technology, Tokyo, Japan — Apr 2022 - Expected Apr 2024
Master of Artificial Intelligence — GPA: 3.95/4.5 — Fully in English
Thesis: Causal Reasoning through Cognition Layers for Improving Generalization in VQA
Full scholarship by Honda Foundation, Japan

University of Science, Ho Chi Minh City, Vietnam — Aug 2017 - Aug 2021
Bachelor of Computer Science — Hornor Program — GPA: 3.72/4.0 — Fully in English
Thesis: Towards Robust Abstractive Text Summarization via Augmenting Essential Information
Full scholarship by Le So Memorial Scholarship of Excellence, USA

Research Interests

Causal Discovery, Generalization, and Human Cognition-inspired AI
AI for Healthcare, Human Diseases, and Health Equity

Publications

First Author*
Co-last Authors**

Reusable Slotwise Mechanisms
Trang Nguyen*, Amin Mansouri, Kanika Madan, Khuong Nguyen, Kartik Ahuja, Dianbo Liu, and Yoshua Bengio
NeurIPS '23 - Neural Information Processing Systems 2023

Causal Reasoning through Two Layers of Cognition for Improving Generalization in VQA
Trang Nguyen* and Naoaki Okazaki
EMNLP '23 Main - Empirical Methods in Natural Language Processing 2023

Performance-Driven Reinforcement Learning Approach for Abstractive Summarization
Trang Nguyen*, Nam Van, and Nhi Tran
PRICAI '21 - The Pacific Rim International Conference on Artificial Intelligence 2021

Contour: Penalty and Spotlight Masks for Abstractive Summarization
Trang Nguyen* and Nhi Tran
ACIIDS '20 - Asian Conference on Intelligent Information and Database Systems 2020

Under Review

Causal Inference in Gene Regulatory Networks with GFlowNet: Towards Scalability in Large Systems
Trang Nguyen*, Alexander Tong, Kanika Madan, Yoshua Bengio**, and Dianbo Liu**
GenBio '23 - Generative AI and Biology Workshop at NeurIPS 2023

In Process

Spotlight Attention: Robust Object-Centric Learning With a Spatial Locality Prior
Ayush K Chakravarthy*, **Trang Nguyen**, Anirudh Goyal, Yoshua Bengio**, and Michael Mozer**

Research Experiences

CogAI4Sci Lab, National University of Singapore - Research Assistant — Oct 2023 - Present
Supervised by Prof. Dianbo Liu — Focusing on causal inference in biological systems
First author of *Causal Inference in Gene Regulatory Networks with GFlowNet: Towards Scalability in Large Systems*

- Proposed the concept of variable-wise influence to enhance causal inference capability and scalability in large intricate biological systems.
- Expanded existing dataset to facilitate the formulation of large-scale causal structures.
- Designed, implemented, and executed experiments and comprehensive data analyses.
- Primarily responsible for the manuscript. Under review at GenBio 2023.

Yoshua Bengio's Students Group, Mila Institute - Research Intern — May 2021 - Present
Supervised by Prof. Yoshua Bengio and Prof. Dianbo Liu — Focusing on System 2, Causality
First author of *Causal Inference in Gene Regulatory Networks with GFlowNet: Towards Scalability in Large Systems*

- Collaborating with the National University of Singapore Research Assistant position.

First author of *Reusable Slotwise Mechanisms*

- Proposed to enhance generalization by relaxing the inductive biases in slots communication.
- Led the execution of experiments, which involved selecting appropriate baselines and datasets, implementing the proposed method, designing ablation studies, and analyzing results.
- Outperformed baselines on video prediction, VQA, and action planning tasks in iid and OOD.
- Primarily responsible for the manuscript and rebuttal period. Published at NeurIPS 2023.

Collaborator of *Spotlight Attention: Robust Object-Centric Learning With a Spatial Locality Prior*

- Participated in the initialization of approaches and the selection of baselines.
- Executed a part of the experiments for downstream tasks.

Others activities

- Participating in Reading Groups hosted by Mila, University of Montreal, and McGill University.
- Engaging in online courses offered by the University of Montreal.

OkazakiLab - Master's Student, Research Assistant Apr 2022 - Apr 2024
Supervised by Prof. Naoaki Okazaki — Focusing on causality in multimodal processing
First author of *Causal Reasoning through Two Layers of Cognition for Improving Generalization in Visual Question Answering*

- Proposed counterfactual learning with two mediators to address the distribution-shift challenge.
- Led the execution of experiments, which encompassed tasks such as baseline selection, dataset choice, method implementation, ablation study design, and comprehensive result analysis.
- Outperformed three baselines on four datasets, achieved new SOTA on the PathVQA dataset, and significantly improved the generalization in the VQA-CPv2 dataset.
- Primarily responsible for the manuscript and rebuttal period. Published at EMNLP 2023.

Others activities

- Attending and presenting at internal Reading Groups and Research Seminars

FPT Software AI Center (collaborated with Mila) - AI Resident May 2021-May 2023
Supervised by Dr. Khuong Nguyen and Chief of AI Officer Dr. Phong Nguyen
Primarily engaged in Mila side.
Others activities

- Attended and presented at internal Reading Groups
- Delivered sharing talks on System 2, Causal Discovery, and research opportunities for students

Knowledge Engineering Lab, University of Science - Research Assistant May 2019-May 2021
Supervised by MSc. Nhi Tran — Focused on gaining the basics of AI, NLP
First author of *Performance-Driven Reinforcement Learning Approach for Abstractive Text Summarization* and *Contour: Penalty and Spotlight Masks for Abstractive Text Summarization* (ATS task)

- Proposed supervised and unsupervised masks in ATS to highlight context-based relevant information in each word prediction turn for improving output's explainability.
- Primarily responsible for the manuscripts. Published at ACIIDS 2020 and PRICAI 2021.

Latest Presentations

Neural Information Processing Systems 2023 New Orleans, US, 2023

Empirical Methods in Natural Language Processing 2023 Singapore, 2023

The Annual Conference of the Association for Natural Language Processing Okinawa, Japan, 2023

Potential Cooperation between Canada and Vietnam in AI Development Hanoi, Vietnam, 2022
by FPT Corporation and Mila Institute
Co-presented with Chief AI Officer Phong Nguyen, Dr. Nghi Bui, and MSc. Frederic Laurin

World-class Research Opportunities for Vietnamese Students Online, 2022
Co-presented with Chief AI Officer Phong Nguyen

Awards

2022 - 2024 *Honda Award* for graduate students studying in Japan - Honda Foundation Japan
2021 *Dean's List of Excellent Research Achievements* - University of Science, Vietnam
2017 - 2021 *Le So Memorial Scholarship of Excellence* Awarded to Vietnamese students who demonstrate financial assistance needs and maintain outstanding academic results - Sunflower Mission USA

Community Involvement

IT Connect Us, *Technical Lead, Solicited computer donations for rural areas* Vietnam, 2019 - 2021
Pacific Links, *Speaker, Guided female students on internet safety* Vietnam, Summer 2019

References

Professor Dianbo Liu - dianbo.liu@alumni.harvard.edu - cogai4sci.com
Professor at the National University of Singapore, Singapore | Group Leader, Researcher at Broad Institute of MIT and Harvard, USA | Postdoctoral researcher at Mila Institute, Canada

Professor Naoaki Okazaki - chokkan.org
Professor at the Tokyo Institute of Technology, Japan

Dr. Phong Nguyen - phongnx1@fpt.com
Chief AI Officer, AI Center, FPT Corporation, Vietnam | Researcher at Mila Institute, Canada