

# BAILEY TRANG NGUYEN

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## EDUCATION

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### Stanford University

Stanford, CA

*PhD in Computer Science*

Sept. 2024 - Expected 05/2028

- Advisors: Professor Ehsan Adeli and Professor Fei-Fei Li
- Research topics: Generative AI, Diffusion Model, World Models, Causal AI, AI for Healthcare
- Awarded *Stanford School of Engineering Graduate Fellowship*

### Tokyo Institute of Technology

Tokyo, Japan

*Master of Artificial Intelligence*

March 2024

- Thesis: *Causal Reasoning through Two Cognition Layers for Improving Generalization in Visual Question Answering*

### Vietnam University of Science

Ho Chi Minh City, Vietnam

*Bachelor of Computer Science - Advanced Program*

Dec. 2021

- Minor: *Artificial Intelligence*

## RESEARCH EXPERIENCE

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### Stanford University PIs: Prof. Ehsan Adeli and Prof. Fei-Fei Li

Stanford, CA

*Diverse Plausible Conditional Image Generation*

Sept. 2024 - Present

- Leading projects to enhance conditional image generation by capturing uncertainty, generating diverse plausible outputs with reusability for downstream tasks.
- Proposed a novel approach to manage uncertainty in conditional image generation by decomposing uncertain inputs into diverse, more certain condition representations.
- Formulated uncertainty by graphical structures and captured uncertainty by sampling diverse trajectories over that graph using Generative Flow Networks.
- Conducted experiments with natural images, 3D brain MRIs, and chest X-rays.
- Outperformed latent diffusion baselines in image generation, image-editing, counterfactual generation, and synthetic data generation tasks, evaluating diversity, quality, and prompt adherence.

### *3D Brain MRI Synthesis*

- Collaborated on projects to enhance 3D brain MRI synthesis to enrich small-sized medical image datasets.
- Contributed to experiments that surpassed various generative baselines, including GANs and diffusion models, achieving anatomically accurate 3D brain synthesis.

### National University of Singapore PI: Prof. Dianbo Liu

Singapore

*Causal Discovery for ICU Forecasting Tasks*

Feb. 2024 - Sept. 2024

- Developed a novel counterfactual consideration approach to mitigate human biases in time series forecasts

### Mila Institute PIs: Prof. Yoshua Bengio and Prof. Dianbo Liu

Quebec, Canada

*Causal Discovery in Gene-Regulatory Networks*

May 2021 - Feb. 2024

- Discover gene-wise influences to improve causal understanding and scalability in large gene systems.
- Outperformed baselines in large-scale gene networks with over 1,000 genes, reducing inference time.

### *Causal Discovery in 3D Physics-Based Moving Systems*

- Design world models that improved generalization and reusable modules by relaxing inductive biases in object slots communication in physics-based simulated moving systems.
- Designed a well generalizable model to complex, unseen scenarios by adaptively learning simple underlying causal relations in object interactions.
- Achieved superior performance in video generation, visual-question answering, and action planning tasks in i.i.d. and OOD settings.

### Tokyo Institute of Technology PI: Prof. Naoaki Okazaki

Tokyo, Japan

*Causal Reasoning in Visual-Natural Language Tasks*

April 2022 - March 2024

- Addressing distribution-shift challenges in visual-language question answering tasks.

- Proposed counterfactual learning approaches with dual mediators to capture and mitigate human linguistic biases in visual answering questions.
- Outperformed baselines across four datasets, achieved state-of-the-art results on the PathVQA dataset, and significantly improved generalization on the VQA-CPv2 dataset.

**Vietnam University of Science PI: Nhi Tran**

Ho Chi Minh City, Vietnam

*Abstractive Text Summarization with Reinforcement Learning*

Aug 2019 - May 2021

- Addressing context capturing challenges in abstractive text summarization.
- Proposed unsupervised reinforcement learning algorithm that learn to emphasize key relevant context in long-text representation learning.
- Outperformed baselines across three datasets and three languages in ROUGE score evaluation.

## SERVICES

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- **Reviewer** at NeurIPS, CVPR, Workshops at NeurIPS & MICCAI.
- **Organizer** of AI Tea Talk Singapore, an online talk series on general AI topics.

## SELECTED PUBLICATIONS

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### Discovering Latent Graphs with GFlowNets for Diverse Conditional Image Generation

*Bailey Trang, Parham Saremi, Alan Wang, Fangrui Huang, Zahra TehraniNasab, Amar Kumar, Tal Arbel, Li Fei-Fei, and Ehsan Adeli*

NeurIPS 2025

### Generating Novel Brain Morphology by Deforming Learned Templates

*Alan Wang, Fangrui Huang, **Bailey Trang**, Wei Peng, Mohammad Abbasi, Kilian Pohl, Mert Sabuncu, and Ehsan Adeli*

MICCAI 2025

### Cycle Diffusion Model for Counterfactual Image Generation

*Fangrui Huang, Alan Q. Wang, Bin Xu Li, **Bailey Trang**, Ridwan Yesiloglu, Tianyu Hua, Wei Peng, and Ehsan Adeli*

PRIME@MICCAI 2025

### Reusable Slotwise Mechanisms

*Bailey Trang, Amin Mansouri, Kanika Madan, Khuong Duy Nguyen, Kartik Ahuja, Dianbo Liu, and Yoshua Bengio*

NeurIPS 2023

### Causal Reasoning Through Two Cognition Layers for Improving Generalization in Visual Question Answering

*Bailey Trang and Naoaki Okazaki*

EMNLP Long-main track 2023

### Causal Discovery in Gene Regulatory Networks with GFlowNet: Towards Scalability in Large Systems

*Bailey Trang, Alexander Tong, Kanika Madan, Yoshua Bengio, and Dianbo Liu*

GenBio@NeurIPS 2023

### Performance-Driven Reinforcement Learning Approach for Abstractive Text Summarization

*Bailey Trang, Nam Chi Van, and Nhi Thao Tran*

PRICAI 2021

### Contour: Penalty and Spotlight Mask for Abstractive Summarization

*Bailey Trang and Nhi Thao Tran*

ACIIDS 2021