

## RESEARCH INTEREST

---

A central theme of my research focuses on making scalable Optimal Transport. In particular, I develop dimensional reduction methods and sub-sampling methods (mini-batch techniques) for Optimal Transport. I am also interested in applications that need to deal with probability measures.

## EDUCATION

---

### University of Texas at Austin

Austin, Texas, USA

Ph.D. in Statistics at Department of Statistics and Data Sciences

2021–Present

### Hanoi University of Science and Technology (HUST)

Hanoi, Vietnam

Bachelor in Information System (another name of Computer Science)

2015–2020

- GPA: 3.61/4.00, Major GPA: 3.71/4.00, Top: 1%, graduated with Excellent Degree.
- Thesis: “Distributional Sliced-Wasserstein and Applications to Generative Modeling”

## EXPERIENCE

---

### VinAI Research, *website: [www.vinai.io](http://www.vinai.io)*

Hanoi, Vietnam

*AI Research Resident*

2019 –2021

- Research topics: Deep Generative Models, Optimal Transport
- Advisors: Dr. Hung Bui (Director of VinAI Research), Dr. Nhat Ho (Assistant Professor at UT, Austin)
- Skills gained: Deep Generative Models (VAEs, GANs, Flows, and Score matching models, etc), Optimal Transport (Sinkhorn algorithm, Slicing approaches, Barycenter, variants of Wasserstein distance, Gromov Wasserstein, etc, Applications of OT (Wasserstein Autoencoder, Wasserstein GAN, Color Transfer, etc)

### Data Science Laboratory (HUST), *website: [ds.soict.hust.edu.vn](http://ds.soict.hust.edu.vn)*

Hanoi, Vietnam

*Undergraduate Research Student*

2018–2020

- Research topics: Probabilistic Graphical Model, Continual Learning.
- Skills gained: Fundamental Machine Learning and Deep Learning, Topic models, Bayesian inference, Variational techniques, etc

## PUBLICATIONS

---

### Improving Mini-batch Optimal Transport via Partial Transportation

**Khai Nguyen**, Dang Nguyen, Tung Pham, Nhat Ho

- *Arxiv*: <https://arxiv.org/abs/2108.09645>
- *Under review*

### On Transportation of Mini-batches: A Hierarchical Approach

**Khai Nguyen**, Dang Nguyen, Quoc Nguyen, Tung Pham, Hung Bui, Dinh Phung, Trung Le, Nhat Ho

- *Arxiv*: <https://arxiv.org/abs/2102.05912>
- *Under review*

### On Multimarginal Partial Optimal Transport: Equivalent Forms and Computational Complexity

Huy Nguyen, Khang Le, **Khai Nguyen**, Tung Pham, Nhat Ho

– Under review

## Structured Dropout Variational Inference for Bayesian Neural Networks

Son Nguyen, Duong Nguyen, **Khai Nguyen**, Khoat Than, Hung Bui, Nhat Ho

– Arxiv: <https://arxiv.org/abs/2102.07927>

– *Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS 2021)*

## Improving Relational Regularized Autoencoders with Spherical Sliced Fused Gromov Wasserstein

**Khai Nguyen**, Son Nguyen, Nhat Ho, Tung Pham, Hung Bui

– Arxiv: <https://arxiv.org/abs/2010.01787>

– *International Conference on Learning Representations (ICLR) 2021*

## Distributional Sliced-Wasserstein and Applications to Generative Modeling

**Khai Nguyen**, Nhat Ho, Tung Pham, Hung Bui

– Arxiv: <https://arxiv.org/abs/2002.07367>

– *International Conference on Learning Representations (ICLR) 2021 (Spotlight 3.8%)*

## PROFESSIONAL SERVICES

---

- Reviewer at International Conference on Machine Learning (ICML) 2021
- Reviewer at Conference on Neural Information Processing Systems (NeurIPS) 2021
- Reviewer at Workshop on Deep Generative Models (NeurIPS) 2021
- Reviewer at International Conference on Learning Representations (ICLR) 2022

## AWARDS

---

- Doctoral Fellowship of University of Texas at Austin 2021
- Third Prize of Scientific Research Student Award of Hanoi University of Science and Technology 2019

## OTHER ACTIVITIES

---

**Top 2% (19 over 1317) in Plant Pathology Challenge** CVPR 2020  
*Fine-Grained Visual Categorization (FGVC) workshop* May 2020

**Southeast Asia Machine Learning School** Greater Jakarta, Indonesia  
*Universitas Indonesia* July 2019

**Technical Talk** Hanoi, Vietnam  
*Data Science Laboratory (HUST)* June 2019

- Make an introduction to Optimal Transport and its applications in deep generative models.
- Slides: <http://bit.ly/3pDEp1f>

**Teaching Assistant** Hanoi, Vietnam  
*Data Science Laboratory (HUST)* April - May, 2019

- Run a small course on fundamental machine learning models such as linear regressions, logistic regressions, k-nearest neighbors, support vector machines, and neural networks for new members.
- Make a tutorial about training deep neural networks with Tensorflow – a deep learning framework.

**Top 12 in The 4th AutoML Challenge (AutoML3+)** PAKDD 2019  
*Provided and Sponsored by 4Paradigm, ChaLearn, Microsoft and Amazon* Jan 2019

## LANGUAGES

---

- **Vietnamese:** Native
- **English:** IELTS - 7.5 Overall, 9.0 Reading, 8.0 Listening, 6.5 Writing, 6.5 Speaking.

## PROGRAMMING LANGUAGES

---

- **Python:** Proficient  
*Libraries: Pytorch, Scikit-Learn, Numpy, etc*
- **Java:** Basic
- **C/C++:** Basic