Khai Nguyen

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Overview

I am a third-year Ph.D. candidate in Statistics at The University of Texas at Austin. My research focus has primarily been on probabilistic machine learning and probabilistic deep learning.

Education

The University of Texas at Austin — Texas, USA
Ph.D. in Statistics at Department of Statistics and Data Sciences — 2021–Present

- Expected graduation date: June, 2026.
- GPA: 3.97/4.0.
- Advisors: Professor Nhat Ho and Professor Peter Mueller.

Hanoi University of Science and Technology (HUST) — Hanoi, Vietnam
B.Sc in Computer Science (5 years program) — 2015–2020

- Top: 1%, graduated with Excellent Degree.
- Thesis: "Distributional Sliced-Wasserstein and Applications to Generative Modeling".

Employment

The Univeristy of Texas at Austin — Texas, USA
Graduate Research Assistant — September, 2023 –May, 2024

- Research topics: Effective and Scalable Transportation Metrics for Computer Graphics and Computer Vision.

Toyota InfoTech Labs — Mountain View, CA, USA
Research Intern — May, 2023 –August, 2023

- Research topics: Transformer for battery-health prediction.
- Proposed Transformer with global-local decomposition framework.

The Univeristy of Texas at Austin — Texas, USA
Graduate Research Assistant — September, 2022 –May, 2023

- Research topics: Large-scale Optimal Transport for Machine Learning.

AT&T Labs — Texas, USA
Research Intern — June, 2022 –August, 2022

- Research topics: User Browsing Behavior Analysis, Co-clustering.
- Proposed and implemented co-clustering algorithms to analyze user browsing behavior in PySpark on DataBricks.

VinAI Research — Hanoi, Vietnam
AI Research Resident — 2019 –2021

- Research topics: Deep Generative Models, Optimal Transport.
- Advisor: Dr. Hung Bui (Director of VinAI Research).
- Did research on Deep Generative Models (VAEs, GANs, score matching, diffusion models) and improved them with Optimal Transport (sliced Wasserstein distance, Sinkhorn divergence).

Publications

(*) denotes equal contribution,
Google Scholar: https://scholar.google.com/citations?user=im5fNaQAAAAJ&hl=en

1. **K. Nguyen**, N. Bariletto, and N. Ho, "Quasi-Monte Carlo for 3D sliced Wasserstein", *International Conference on Learning Representations (ICLR)*, 2024.

2. **K. Nguyen** and N. Ho, "Sliced Wasserstein estimation with control variates", *International Conference on Learning Representations (ICLR)*, 2024.

3. T. Le, **K. Nguyen**, N. Ho, S. Sun, K. Han, and X. Xie, "Diffeomorphic deformation via sliced Wasserstein distance optimization for cortical surface reconstruction", *International Conference on Learning Representations (ICLR)*, 2024.

4. M. Luong, **K. Nguyen**, N. Ho, R. Haf, D. Phung, and L. Qu, "Revisiting deep audio-text retrieval through the lens of transportation", *International Conference on Learning Representations (ICLR)*, 2024.

5. H. Nguyen, **K. Nguyen**, and N. Ho, "On parameter estimation in deviated gaussian mixture of experts", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2024.

6. H. Nguyen, T. Nguyen, **K. Nguyen**, and N. Ho, "Towards convergence rates for parameter estimation in gaussian-gated mixture of experts", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2024.

7. **K. Nguyen** and N. Ho, "Energy-based sliced Wasserstein distance", *Neural Information Processing Systems (NeurIPS)*, 2023.

8. **K. Nguyen**, T. Ren, and N. Ho, "Markovian sliced Wasserstein distances: Beyond independent projections", *Advances in Neural Information Processing Systems (NeurIPS)*, 2023.

9. D. Le*, H. Nguyen*, **K. Nguyen***, T. Nguyen, and N. Ho, "Fast approximation of the generalized sliced-Wasserstein distance", *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2024.

10. X. Han, T. Ren, T. M. Nguyen, **K. Nguyen**, J. Ghosh, and N. Ho, "Robustify Transformers with robust kernel density estimation", *Neural Information Processing Systems (NeurIPS)*, 2023.

11. D. Do, H. Nguyen, **K. Nguyen**, and N. Ho, "Minimax optimal rate for parameter estimation in multivariate deviated models", *Neural Information Processing Systems (NeurIPS)*, 2023.

12. **K. Nguyen***, D. Nguyen*, and N. Ho, "Self-attention amortized distributional projection optimization for sliced Wasserstein point-clouds reconstruction", *International Conference on Machine Learning (ICML)*, 2023.

13. **K. Nguyen**, T. Ren, H. Nguyen, L. Rout, T. Nguyen, and N. Ho, "Hierarchical sliced Wasserstein distance", *International Conference on Learning Representations (ICLR)*, 2023.

14. D. Nguyen, T. Nguyen, **K. Nguyen**, D. Phung, H. Bui, and N. Ho, "Model fusion of heterogeneous neural networks via cross-layer alignment", *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2023.

15. **K. Nguyen** and N. Ho, "Revisiting sliced Wasserstein on images: From vectorization to convolution", *Neural Information Processing Systems (NeurIPS)*, 2022.

16. **K. Nguyen** and N. Ho, "Amortized projection optimization for sliced Wasserstein generative models", *Neural Information Processing Systems (NeurIPS)*, 2022.

17. T. Nguyen, M. Pham, T. Nguyen, **K. Nguyen**, S. J. Osher, and N. Ho, "Transformer with Fourier integral attentions", *Neural Information Processing Systems (NeurIPS)*, 2022.

18. T. Nguyen, T. Nguyen, H. Do, **K. Nguyen**, V. Saragadam, M. Pham, K. Nguyen, N. Ho, and S. J. Osher, "Improving transformer with an admixture of attention heads", *Neural Information Processing Systems (NeurIPS)*, 2022.

19. **K. Nguyen***, D. Nguyen*, T. Pham, and N. Ho, "Improving mini-batch optimal transport via partial transportation", in *International Conference on Machine Learning (ICML)*, 2022.

20. **K. Nguyen**, D. Nguyen, Q. Nguyen, T. Pham, H. Bui, D. Phung, T. Le, and N. Ho, "On transportation of mini-batches: A hierarchical approach", in *International Conference on Machine Learning (ICML)*, 2022.

21. K. Le, H. Nguyen, **K. Nguyen**, T. Pham, and N. Ho, "On multimarginal partial optimal transport: Equivalent forms and computational complexity", in *International Conference on Artificial Intelligence and Statistics (AISTATS)*, PMLR, 2022, pp. 4397–4413.

22. S. Nguyen, D. Nguyen, **K. Nguyen**, K. Than, H. Bui, and N. Ho, "Structured dropout variational inference for bayesian neural networks", *Neural Information Processing Systems (NeurIPS)*, 2021.

23. **K. Nguyen**, N. Ho, T. Pham, and H. Bui, "Distributional sliced-Wasserstein and applications to generative modeling", in *International Conference on Learning Representations (ICLR)*, 2021.

24. **K. Nguyen**, S. Nguyen, N. Ho, T. Pham, and H. Bui, "Improving relational regularized autoencoders with spherical sliced fused Gromov-Wasserstein", in *International Conference on Learning Representations (ICLR)*, 2021.

Preprints

(*) denotes equal contribution

1. **K. Nguyen**, S. Zhang, T. Le, and N. Ho, "Sliced Wasserstein with random-path projecting directions", *Under Review*, 2024.

Professional services

- Reviewer at Journal of Machine Learning Research (JMLR).
- Reviewer at Machine Learning Journal.
- Reviewer at IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI).
- Reviewer at International Conference on Machine Learning (ICML) 2021-2024.
- Reviewer at Workshop on Challenges in Deployable Generative AI (ICML) 2023.
- Reviewer at Conference on Neural Information Processing Systems (NeurIPS) 2021-2023.
- Reviewer at Workshop on Deep Generative Models (NeurIPS) 2021.
- Reviewer at International Conference on Learning Representations (ICLR) 2022-2024.
- Reviewer at International Conference on Artificial Intelligence and Statistics (AISTATS) 2022-2024.
- Reviewer at AAAI Conference on Artificial Intelligence (AAAI) 2023-2024.
- Reviewer at IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR) 2023-2024.
- Reviewer at International Conference on Computer Vision (ICCV) 2023.

Awards

- ICML 2023 Travel Grants (about $2,000). 2023
- Top Reviewer Award at NeurIPS 2022 (about $1,000). 2022
- NeurIPS 2022 Scholar Award (about $2,000). 2022
- ICML 2022 Travel Grants (about $2,000). 2022
- UT Austin Doctoral Fellowship (about $30,000). 2021

Technical Skills

- **Python:** Proficient.

  Libraries: Pytorch (proficient), Tensorflow (basic), Scikit-Learn (proficient), Numpy (proficient), Pandas (basic), Matplotlib (proficient), Pyspark (basic), and so on.
- **Developer Tools:** Git.
- **Systems:** Linux.