Khai Nguyen

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Overview

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

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: May, 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 Information Systems (5 years program) — 2015–2020

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

Employment

The University of Texas at Austin — Texas, USA
Graduate Research Assistant — January, 2025 –Now

- Research topic: Machine Learning for the Human Epilepsy Analysis.

The University of Texas at Austin — Texas, USA
Graduate Teaching Assistant — August, 2024 –January, 2025

- Courses: Linear Models, Elements of Statistics

Amazon.com Inc — Seattle, WA, USA
Applied Scientist Intern — May, 2024 –August, 2024

- Proposed a framework that leverages large language models and deep generative models to increase the diversity of product recommendations.

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

- Research topic: Effective and Scalable Transportation Metrics for Machine Learning, Statistics, and Data Sciences.

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

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

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

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

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

– Proposed and implemented co-clustering algorithms to analyze user browsing behavior in PySpark on DataBricks.

VinAI Research (Acquired by Qualcomm AI Research) Hanoi, Vietnam
AI Research Resident 2019 –2021

– Did research on Deep Generative Models (VAEs, GANs, score matching, diffusion models) and improved them with Optimal Transport (sliced Wasserstein distance, Sinkhorn divergence).

Refereed Publications

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

1. **K. Nguyen***, H. Nguyen*, and N. Ho, "Towards marginal fairness sliced Wasserstein barycenter", *International Conference on Learning Representations (ICLR),* ***Spotlight 3.2%***, 2025.

2. **K. Nguyen** and N. Ho, "Hierarchical hybrid sliced Wasserstein: A scalable metric for heterogeneous joint distributions", *Neural Information Processing Systems (NeurIPS)*, 2024.

3. **K. Nguyen**, S. Zhang, T. Le, and N. Ho, "Sliced Wasserstein with random-path projecting directions", *International Conference on Machine Learning (ICML)*, 2024.

4. T. T. Le, **K. Nguyen**, S. Sun, N. Ho, and X. Xie, "Integrating efficient optimal transport and functional maps for unsupervised shape correspondence learning", in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.

5. **K. Nguyen**, N. Bariletto, and N. Ho, "Quasi-Monte Carlo for 3D sliced Wasserstein", *International Conference on Learning Representations (ICLR),* ***Spotlight 5%***, 2024.

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

7. 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.

8. 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.

9. 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.

10. 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.

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

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

13. 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.

14. 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.

15. 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.

16. **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.

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

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

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

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

21. 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.

22. 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.

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

24. **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.

25. 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.

26. 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.

27. **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.

28. **K. Nguyen**, N. Ho, T. Pham, and H. Bui, "Distributional sliced-Wasserstein and applications to generative modeling", in *International Conference on Learning Representations (ICLR),* ***Spotlight 3.78%***, 2021.

Preprints

(*) denotes equal contribution

1. **K. Nguyen**, Y. Ni, and P. Mueller, "Bayesian density-density regression with application to cell-cell communications", *Under review at Journal of the American Statistical Association*, 2025.
2. **K. Nguyen** and P. Mueller, "Summarizing Bayesian nonparametric mixture posterior - sliced optimal transport metrics for Gaussian mixtures", *Under review at Journal of Computational and Graphical Statistics*, 2025.
3. **K. Nguyen***, H. Nguyen*, T. Pham, and N. Ho, "Lightspeed geometric dataset distances via sliced optimal transport", *Under review*, 2025.
4. M. Luong, **K. Nguyen**, D. Phung, G. Haffari, and L. Qu, "Unbiased sliced Wasserstein kernels for high-quality audio captioning", *Under Review*, 2025.
5. T. Nguyen M., N. Tran N., **K. Nguyen**, and R. Baraniuk, "Improving routing in sparse mixture of experts with graph of tokens", *Under Review*, 2025.
6. N. Bariletto, **K. Nguyen**, and N. Ho, "Data-driven dro and economic decision theory: An analytical synthesis with bayesian nonparametric advancements", *Under Review*, 2025.

Awards

- BNP14 Travel Award. 2025
- UT Austin Continuing Fellowship. 2025
- Top Reviewer Award at NeurIPS 2024. 2024
- ICML 2023 Travel Grants. 2023
- Top Reviewer Award at NeurIPS 2022. 2022
- NeurIPS 2022 Scholar Award. 2022
- ICML 2022 Travel Grants. 2022
- UT Austin Recruitment Fellowship. 2021

Talks

- The Bayesian Young Statisticians Meeting (Talk in session with discussion): "Summarizing Bayesian Nonparametric Mixture Posterior - Sliced Optimal Transport Metrics for Gaussian Mixtures", 2025.
- International Conference on Bayesian Nonparametrics (Contributed Talk): "Summarizing Bayesian Nonparametric Mixture Posterior - Sliced Optimal Transport Metrics for Gaussian Mixtures", 2025.
- International Conference on Machine Learning (ICML) (Spotlight Talk): "On Transportation of Mini-batches: A Hierarchical Approach", 2022.
- International Conference on Machine Learning (ICML) (Spotlight Talk): "Improving Mini-batch Optimal Transport via Partial Transportation", 2022.

Professional services

- Reviewer at Journal of Machine Learning Research (JMLR).
- Reviewer at IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI).
- Reviewer at IEEE Transactions on Information Theory.

- Reviewer at Machine Learning Journal.
- Reviewer at International Conference on Machine Learning (ICML) 2022-2025.
- Reviewer at Workshop on Challenges in Deployable Generative AI (ICML) 2023.
- Reviewer at Conference on Neural Information Processing Systems (NeurIPS) 2021-2025.
- Reviewer at Workshop on Deep Generative Models (NeurIPS) 2021.
- Reviewer at International Conference on Learning Representations (ICLR) 2022-2025.
- Reviewer at International Conference on Artificial Intelligence and Statistics (AISTATS) 2022-2025.
- Reviewer at AAAI Conference on Artificial Intelligence (AAAI) 2023-2025.
- Reviewer at IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR) 2023-2025.
- Reviewer at International Conference on Computer Vision (ICCV) 2023.
- Reviewer at European Conference on Computer Vision (ECCV) 2024.
- Reviewer at IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2024-2025.
- Reviewer at Conference on Language Modeling (COLM) 2024-2025.
- Reviewer at Learning on Graphs Conference (LOG) 2024.

Professional Membership

- Institute of Electrical and Electronics Engineers (IEEE) *Regular Member*.
- International Society for Bayesian Analysis (ISBA) *Student Member*.
- Institute of Mathematical Statistics (IMS) *Student Member*.

Technical Skills

- **Python:** Proficient.

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