Yikun (Ike) Bai

Curriculum Vitae

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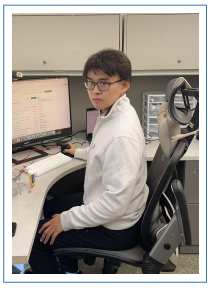

Research Interest

- Optimal transport: Unbalanced/Sliced/Linear/Spherical/Gromov Wasserstein problems
- Generative Model: GANs, Flow matching/diffusion model

Education

Feb, 2022 **Ph.D., Electrical and computer engineering**, *University of Delaware, U.S.*, GPA: 4.0/4.0,
Dissertation: Optimal transport meets information science: from measure concentration, to information theory, to machine learning.
Committee members: Dr. Xianggen Xia, Dr. Mokshay Madiman, Dr. Javier Garcia-Frias

May, 2016 **Master, Mathematics**, *Marshall University, U.S.*, GPA: 4.0/4.0,
Project: Quotient RBF methods for Numerical PDE.
Project Advisor: Dr. Sarra Scott

May, 2012 **Bacholor, Medical Imagining**, *Mudanjiang Medical University (China)*, GPA: 3.3/4.0.

Academic Employment

Vanderbilt University, U.S.

2022 – present ***Postdoctoral Researcher — Computer Science***.

- Assistant of research Lab Management: mentor undergraduate and Ph.D. students
- Lead NSF-funded and DAPRA-funded research projects. Published 10+ papers in top-tier venues (ICLR, ICML, CVPR, NeurIPS); two recognized as Spotlight.
- Spearhead proposal development for DARPA and NSF proposals
- Teach **Fundamentals of Machine Learning** (CS 6528, 3 credits)
- Contributor to PythonOT library (Github star 2.6k).

Mentor **Dr. Soheil Kolouri**, *Assistant Professor, Department of Computer Science*, Vanderbilt Univeristy

University of Delaware

2019 – 2021 ***Research/teaching Assistant***.

- Lead research project supported by NSF. 4 papers have been published in top-tier venues (ISIT, JMLR, TIT).
- Contributed writing for multiple NSF grant proposals.
- Teaching Assistant in Advanced Machine Learning (ELEG602, 3 credits), Convex Optimization (ELELG667, 3credits), Probability and Statistics (ELEG310, 3 credits).

Mentor **Dr. Javier Garcia-Frias**, *Associate Professor, Department of Electrical and Computer Engineering*, University of Delaware

Publications

Preprint

2025 **Yikun Bai**, Huy Tran, Hengrong Du, Xinran Liu, and Soheil Kolouri. Fused partial gromov-wasserstein for structured objects. *arXiv preprint arXiv:2502.09934*, 2025.

2024 Huy Tran*, **Yikun Bai***, Ashkan Shahbazi, John R Hershey, and Soheil Kolouri. Understanding learning with sliced-wasserstein requires rethinking informative slices. *arXiv preprint arXiv:2411.10651*, 2024.

Journal

2024 **Yikun Bai**, Huy Tran, Steven B Damelin, and Soheil Kolouri. Partial transport for point-cloud registration. *Sampling Theory, Signal Processing, and Data Analysis (SaSiDa)*, 2024.

2023 **Yikun Bai**, Xiugang Wu, and Ayfer Özgür. Information constrained optimal transport: From talagrand, to marton, to cover. *IEEE Transactions on Information Theory*, volume 69, pages 2059–2073. IEEE, 2023.

2023 Daria Reshetova, **Yikun Bai**, Xiugang Wu, and Ayfer Ozgur. Understanding entropic regularization in gans. In *Journal of Machine Learning Research*, 2023.

2022 Xinran Liu, **Yikun Bai**, Yuzhe Lu, Andrea Soltoggio, and Soheil Kolouri. Wasserstein task embedding for measuring task similarities. *Neural Networks*, 2022.

2018 Scott A Sarra and **Yikun Bai**. A rational radial basis function method for accurately resolving discontinuities and steep gradients. *Applied Numerical Mathematics*, volume 130, pages 131–142. Elsevier, 2018.

Conference

2024 Huy Tran*, **Yikun Bai***, Abihith Kothapalli*, Ashkan Shahbazi, Xinran Liu, Rocio Diaz Martin, and Soheil Kolouri. Stereographic spherical sliced wasserstein distances. *International Conference on Machine Learning(ICML),* ***spotlight, top 2.5%***. PMLR, 2024.

2024 **Yikun Bai**, Rocio Diaz Martin, Hengrong Du, Ashkan Shahbazi, and Soheil Kolouri. Partial gromov-wasserstein metric. *International Conference on Learning Representations (ICLR)*, 2024.

2024 **Yikun Bai**, Abihith Kothapalli, Hengrong Du, Rocio Diaz Martin, and Soheil Kolouri. Linear partial gromov-wasserstein embedding. *International Conference on Learning Representations (ICLR)*, 2024.

2024 Rocio P Diaz Martin*, Ivan Vladimir Medri*, **Yikun Bai***, Xinran Liu, Kangbai Yan, Gustavo Rohde, and Soheil Kolouri. Lcot: Linear circular optimal transport. *International Conference on Learning Representations (ICLR)*, 2024.

2024 Xinran Liu, **Yikun Bai**, Rocío Díaz Martín, Kaiwen Shi, Ashkan Shahbazi, Bennett A Landman, Catie Chang, and Soheil Kolouri. Linear spherical sliced optimal transport: A fast metric for comparing spherical data. *International Conference on Learning Representations (ICLR),* ***spotlight, top 5%***, 2024.

2024 Xinran Liu, Rocío Díaz Martín, **Yikun Bai**, Ashkan Shahbazi, Matthew Thorpe, Akram Aldroubi, and Soheil Kolouri. Expected sliced transport plans. *International Conference on Learning Representations (ICLR)*, 2024.

2023 **Yikun Bai***, Bernhard Schmitzer*, Mathew Thorpe, and Soheil Kolouri. Sliced optimal partial transport. *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.

2023 **Yikun Bai**, Ivan Vladimir Medri, Rocio Diaz Martin, Rana Shahroz, and Soheil Kolouri. Linear optimal partial transport embedding. In *International Conference on Machine Learning*, pages 1492–1520. PMLR, 2023.

2023 Xinran Liu*, **Yikun Bai***, Zhanqi Zhu, Mathew Thorpe, and Soheil Kolouri. Ptlp: Partial transport lp distances. *Optimal Transport and Machine Learning Workshop at Neural Information Processing Systems (NeurIPS OT workshop)*, 2023.

2021 Daria Reshetova, **Yikun Bai**, Xiugang Wu, and Ayfer Özgür. Understanding entropic regularization in gans. In *2021 IEEE International Symposium on Information Theory (ISIT)*, pages 825–830. IEEE, 2021.

2020 **Yikun Bai**, Xiugang Wu, and Ayfer Özgür. Information constrained optimal transport: From talagrand, to marton, to cover. In *2020 IEEE International Symposium on Information Theory (ISIT)*, pages 2210–2215. IEEE, 2020.

Fellowships & Awards

2025	**Travel grant** of Midwest Numerical Analysis Day	University of Nebraska-Linclon
2023	**Travel grant** of KIAS(Korea Institute For Advanced Study)	Seoul University
2023	**Travel grant** of Southeastern Analysis Meeting)	Clemson University
2021	**Award** of ECE Research Seminar	University of Delaware
2017	**Research fund** of GEMS Project	University of Delaware

Presentations & Talks

2025 **Midwest Numerical Analysis Day**, *University of Nebraska-Lincoln*.
Topic: Partial Gromov Wassertein computation

2025 **Optimal Transport and Statistics Workshop**, *Columbia University*.
Topic: Linear Partial Gromov Wassertein

2024 **SIAM Conference on Mathematics of Data Science**.
Topic: Spherical Sliced Optimal Transport

2023 **Conference on Computer Vision and Pattern Recognition (CVPR)**.
Topic: Sliced Optimal partial transport

2023 **Southeastern Analysis Meeting**, *Colemson University*.
Topic: Sliced Optimal partial transport Computation

2023 **Korea Institute For Advanced Study (KIAS) AI seminar**, *Seoul University*.
Topic: Sliced Optimal partial transport Computation

2023 **International Conference on Machine Learning**.
Topic: Linear Optimal Partial Transport Embedding

External Service

Conference Reviewer

ICML	International Conference on Machine Learning	2025
ICLR	The International Conference on Learning Representations	2024
Neurips	conference on neural information processing systems	2024-2025
WiSDM	Women in Data Science and Mathematics	2024
ITW	IEEE Information Theory Workshop	2024
ISIT	IEEE International Symposium on Information Theory	2022-2025
ICPR	International Conference on Pattern Recognition	2024

Journal Reviewer

JS	The Journal of Supercomputing	2025
NN	Neural Networks	2025
TNNLS	IEEE Transactions on Neural Networks and Learning Systems	2024-2025
SaSiDa	Sampling Theory, Signal Processing, and Data Analysis	2024
CVIU	Computer Vision and Image Understanding	2024
SPL	IEEE Signal Processing Letters	2023-2024
PAMI	IEEE Transactions on Pattern Analysis and Machine Intelligence	2023
TCSVT	IEEE Transactions on Circuits and Systems for Video Technology	2023

Teaching Experience

Fall 2023 **CS5262: Foundations of Machine Learning**, *Vanderbilt University*.
Guest Instructor

Spring 2019, Fall 2020 **ELEG602: Advanced Machine learning**, *University of Delaware*.
Teaching Assistant

Fall 2019 **ELEG667: Convex optimization**, *University of Delaware*.
Teaching Assistant

Mentoring

2022-2023 **Rana Muhammad Shahroz Khan**, *Undergraduate in CS department*, Vanderbilt University.
Next position: CS PhD at UNC-Chapel Hill

2024-2025 **Abi Kothapalli**, *Undergraduate in CS department*, Vanderbilt University.
Next position: CS PhD at Carnegie Mellon University

2023-2025 **Huy Tran**, *Ph.D. in CS department*, Vanderbilt University.

2023-2024 **Ashkan Shahbazi**, *Ph.D. in CS department*, Vanderbilt University.

2025 **Ping He**, *Ph.D. in CS department*, Vanderbilt University.

Referees

Dr. Soheil Kolouri
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Computer Science Department
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