Wenjun Zhao

CONTACT INFORMATION

Division of Applied Mathematics
Brown University
Room 219, 182 George Street
Providence, RI 02906

wenjun_zhao@brown.edu
https://wenjunzhaowo.github.io

EMPLOYMENT

Division of Applied Mathematics, Brown University

LFZ Assistant Professor of Applied Mathematics, July 2021-June 2024

- Mentor: Professor Björn Sandstede

EDUCATION

Courant Institute of Mathematical Sciences, New York University

Ph.D. , Atmosphere Ocean Science & Mathematics, May 2021
M.Phil. , Atmosphere Ocean Science & Mathematics, Jan 2021

- Advisor: Professor Esteban G. Tabak

School of the Gifted Young, University of Science and Technology of China

B.S. in Information and Computational Sciences, June 2016

- Advisor: Professor Yu-Hong Dai (Chinese Academy of Sciences)

INTERNSHIP & VISITING

Argonne National Laboratory, Mathematics and Computer Science Dept.

Wallace Givens Associate, June–Aug. 2020

- Mentor: Dr. Hong Zhang

University of Oxford, Department of Computer Science

Visiting student, May–Sept. 2015

- Mentor: Professor Alessandro Abate

RESEARCH INTERESTS

Optimal transport and its applications; Computational biology;
Scientific machine learning.

PUBLICATIONS

Tabak, E.G., Trigila, G. & Zhao, W., *The Hierarchical Barycenter: Conditional Probability Simulation with Structured and Unobserved Covariates*, in preparation.

Zhao, W.,Maffa, S., & Sandstede, B., *Quantifying Patterns and Their Transitions in Spatially Extended Systems*, in preparation.

Zhao, W. & Tabak, E.G., *Adaptive Kernel Conditional Density Estimation*, in review.

Tabak, E.G., Trigila, G. & Zhao, W., *The Conditional Barycenter Problem, its Data-Driven Formulation and its Solution through Normalizing Flows*, accepted to Communications in Mathematical Science.

Zhang, H. & Zhao, W., *A Memory-Efficient Neural Ordinary Differential Equation Framework Based on High-Level Adjoint Differentiation*, IEEE Transactions on Artificial Intelligence (2022). https://doi.org/10.1109/TAI.2022.3230632

Tabak, E.G., Trigila, G. & Zhao, W., *Distributional barycenter problem through data-driven flows*, Pattern Recognition (2022). https://doi.org/10.1016/j.patcog.2022.108795.

Zhao, W. *Sample-based Optimal Transport in Statistical Data analysis*, PhD Thesis.

Tabak, E.G., Trigila, G. & Zhao, W., *Conditional density estimation and simulation through optimal transport.* Machine Learning (2020). https://doi.org/10.1007/s10994-019-05866-3.

Tabak, E.G., Trigila, G. & Zhao, W., *Data Driven Conditional Optimal Transport.*

- Shorter version: 33*rd* Conference on Neural Information Processing Systems (NeurIPS) OTML Workshop (2019). https://arxiv.org/abs/1910.11422
- Longer version: Tabak, E.G., Trigila, G. & Zhao, W. Machine Learning (2021). https://doi.org/10.1007/s10994-021-06060-0

Teaching Experience

Fall	2023	Instructor, Honors Statistical Inference I (Enrollment: 37)	Brown
Summer	2023	Instructor, MATLAB mini-course for EDGE program	Brown
Spring	2023	Instructor, Essential Statistics (Enrollment: 73)	Brown
Fall	2022	Instructor, Honors Statistical Inference I (Enrollment: 84)	Brown
Spring	2022	Instructor, Essential Statistics (Enrollment: 64)	Brown
Fall	2021	Instructor, Statistical Inference I (Enrollment: 203)	Brown
Spring	2021	Recitation leader, Intro to Fluid Dynamics, Complex Variables	NYU
Fall	2020	Grader, Linear Algebra for Data Science	NYU
Spring	2020	Recitation leader, Introduction to Math Modeling	NYU
Fall	2019	Recitation leader, Introduction to Math Modeling	NYU
Spring	2019	Recitation leader, Ordinary Differential Equations	NYU
Fall	2018	Substitute lecturer/Grader, Partial Differential Equations	NYU
Fall	2015	Teaching assistant, Multivariable Calculus	USTC

Honors and Awards

2023	Dean's Award for Excellence in Teaching, Brown
2021	Named LFZ Assistant Professorship of Applied Mathematics, Brown
2020	Nomination for Dean's Dissertation Fellowship, NYU
2019	NeurIPS travel award
2019	Moses A. Greenfield Research Prize, NYU Courant
2016–now	Henry MacCracken Fellowship, NYU
2015	Summer research fellowship at University of Oxford
2015	Meritorious Winner in Mathematical Contest of Modeling
2013	First prize in USTC Contest of Electromagnetics
2012–2016	China National Encouragement Scholarship

Services

- Mini-course instructor for EDGE (Enhancing Diversity in Graduate Eduation) (2023)
- Co-organizer (with Kun Meng) of Pattern Theory Group Seminar at Brown
- Ad hoc reviewer for:
  Bulletin of Mathematical Biology, Pattern Recognition, Journal of Machine Learning for Modeling and Computing
- Provide reference letters for 12 undergraduate students

Conferences & Workshops

Conditional optimal transport and its applications (Talk), Physical Applied Mathematics and Data Science, ShanghaiTech University, Shanghai, China. (Jan 2020)

Data Driven Conditional Optimal Transport (Poster), NeurIPS Optimal Transport in Machine Learning Workshop, Vancouver, Canada. (Dec 2019)

Seminar Talks

Wasserstein barycenter for conditional density estimation and simulation, Computational and Applied Math Seminar, Tufts University (May 1 2023)

Data-driven Wasserstein barycenter problem, Leslie Comrie Seminar Series, University of Greenwich (Mar 30 2022)

Optimal transport and beyond, Math Slam, Brown University (Dec 2 2021)

Data-driven Wasserstein barycenter problem, LCDS & Pattern theory seminar, Brown University. (Oct 4 2021)

Optimal transport with covariates and its applications, APMA colloquium, Brown University. (Sept 23 2021)

Barycentric Optimal Transport: algorithms and applications, CAOS student seminar, New York University. (Nov 2020)

Advanced Neural ODE Solver through PETSc, Summer Argonne Students' Symposium 2020, Argonne National Laboratory. (Apr 2020)

Conditional optimal transport and its applications, CAOS student seminar, New York University. (Nov 2019)

A simplified entrainment model based on shallow water equation, CAOS student seminar, New York University. (Nov 2018)

Conditional density estimation through optimal transport, CAOS student seminar, New York University. (Dec 2017)

Additional Training

Launch Course Design Institute, Sheridan Center for Teaching and Learning, Brown University, Providence, USA. (August 2021)

Science Communications Workshop, Arthur L. Carter Journalism Institute, New York University, New York, USA. (Oct 2019)

NASA JPL-Caltech Summer School: Using Satellite Observations to Advance Climate Models, Pasadena, USA. (Aug 2018)

References

- Professor Bjorn Sandstede (Research, postdoc mentor)
  Division of Applied Mathematics, Brown University,
  bjorn_sandstede@brown.edu
- Professor Matthew Harrison (Teaching)
  Division of Applied Mathematics, Brown University,
  matthew_harrison@brown.edu
- Professor Ritambhara Singh (Research)
  Department of Computer Science, Brown University,
  ritambhara@brown.edu
- Professor Esteban G. Tabak (Research, PhD advisor)
  Department of Mathematics, New York University,
  tabak@cims.nyu.edu