

# Wenjun Zhao

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CONTACT INFORMATION	Division of Applied Mathematics Brown University Room 219, 182 George Street Providence, RI 02906	<a href="mailto:wenjun_zhao@brown.edu">wenjun_zhao@brown.edu</a> <a href="https://wenjunzhaowo.github.io">https://wenjunzhaowo.github.io</a>
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EMPLOYMENT	<b>Division of Applied Mathematics, Brown University</b> LFZ Assistant Professor of Applied Mathematics, July 2021-June 2024 <ul style="list-style-type: none"><li>• Mentor: Professor Björn Sandstedte</li></ul>
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EDUCATION	<b>Courant Institute of Mathematical Sciences, New York University</b> M.Phil. , Atmosphere Ocean Science & Mathematics, Jan 2021 Ph.D. , Atmosphere Ocean Science & Mathematics, May 2021 <ul style="list-style-type: none"><li>• Advisor: Professor Esteban G. Tabak</li></ul> <b>School of the Gifted Young, University of Science and Technology of China</b> B.S. in Information and Computational Sciences, June 2016 <ul style="list-style-type: none"><li>• Advisor: Professor Yu-Hong Dai (Chinese Academy of Sciences)</li></ul>
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INTERNSHIP & VISITING	<b>Argonne National Laboratory, Mathematics and Computer Science Dept.</b> Wallace Givens Associate, June–Aug. 2020 <ul style="list-style-type: none"><li>• Mentor: Dr. Hong Zhang</li></ul> <b>University of Oxford, Department of Computer Science</b> Visiting student, May–Sept. 2015 <ul style="list-style-type: none"><li>• Mentor: Professor Alessandro Abate</li></ul>
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RESEARCH INTERESTS	Optimal transport and its applications; Computational biology; Scientific machine learning.
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PUBLICATIONS	Tabak, E.G., Trigila, G. & Zhao, W., <i>The Hierarchical Barycenter: Conditional Probability Simulation with Structured and Unobserved Covariates</i> , in preparation.  Zhao, W. & Sandstedte, B., <i>Quantifying Patterns and Their Transitions in Spatially Extended Systems</i> , in preparation.  Zhao, W. & Tabak, E.G., <i>Adaptive Kernel Conditional Density Estimation</i> , in review.  Tabak, E.G., Trigila, G. & Zhao, W., <i>The Conditional Barycenter Problem, its Data-Driven Formulation and its Solution through Normalizing Flows</i> , accepted to Communications in Mathematical Science.  Zhang, H. & Zhao, W., <i>A Memory-Efficient Neural Ordinary Differential Equation Framework Based on High-Level Adjoint Differentiation</i> , IEEE Transactions on Artificial Intelligence (2022). <a href="https://doi.org/10.1109/TAI.2022.3230632">https://doi.org/10.1109/TAI.2022.3230632</a>
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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: 33rd 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 Education) (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	<i>Conditional optimal transport and its applications</i> (Talk), Physical Applied Mathematics and Data Science, ShanghaiTech University, Shanghai, China. (Jan 2020)
	<i>Data Driven Conditional Optimal Transport</i> (Poster), NeurIPS Optimal Transport in Machine Learning Workshop, Vancouver, Canada. (Dec 2019)

SEMINAR TALKS	<i>Wasserstein barycenter for conditional density estimation and simulation</i> , Computational and Applied Math Seminar, Tufts University (May 1 2023)
	<i>Data-driven Wasserstein barycenter problem</i> , Leslie Comrie Seminar Series, University of Greenwich (Mar 30 2022)
	<i>Optimal transport and beyond</i> , Math Slam, Brown University (Dec 2 2021)
	<i>Data-driven Wasserstein barycenter problem</i> , LCDS & Pattern theory seminar, Brown University. (Oct 4 2021)
	<i>Optimal transport with covariates and its applications</i> , APMA colloquium, Brown University. (Sept 23 2021)
	<i>Barycentric Optimal Transport: algorithms and applications</i> , CAOS student seminar, New York University. (Nov 2020)
	<i>Advanced Neural ODE Solver through PETSc</i> , Summer Argonne Students' Symposium 2020, Argonne National Laboratory. (Apr 2020)
	<i>Conditional optimal transport and its applications</i> , CAOS student seminar, New York University. (Nov 2019)
ADDITIONAL TRAINING	<i>A simplified entrainment model based on shallow water equation</i> , CAOS student seminar, New York University. (Nov 2018)
	<i>Conditional density estimation through optimal transport</i> , CAOS student seminar, New York University. (Dec 2017)
	Launch Course Design Institute, Sheridan Center for Teaching and Learning, Brown University, Providence, USA. (August 2021)
REFERENCES	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)
	<ul style="list-style-type: none"> <li>• Professor Bjorn Sandstede (Research, postdoc mentor) Division of Applied Mathematics, Brown University, bjorn_sandstede@brown.edu</li> <li>• Professor Matthew Harrison (Teaching) Division of Applied Mathematics, Brown University, matthew_harrison@brown.edu</li> <li>• Professor Ritambhara Singh (Research) Department of Computer Science, Brown University, ritambhara@brown.edu</li> <li>• Professor Esteban G. Tabak (Research, PhD advisor) Department of Mathematics, New York University, tabak@cims.nyu.edu</li> </ul>