

SPRING 2024

RENSSELAER POLYTECHNIC INSTITUTE

DEPARTMENT OF MATHEMATICAL SCIENCES COLLOQUIUM

Wenjun Zhao (Brown University)

January 18, 2024 - 4pm

PITTS 4206

Optimal transport for statistics and computational biology

Optimal transport has emerged as a powerful tool in various fields, such as image processing, data analysis, and social sciences. This talk consists of two parts, focusing on two particular applications of optimal transport in statistics and computational biology respectively. Real-world examples within purely data-driven settings will be presented to demonstrate our methodologies in each part.

In the first part, we introduce the Wasserstein barycenter problem and its extension to continuous factors. To showcase its applicability in statistics, we propose a general framework using the barycenter problem for conditional density estimation and simulation. This part is based on joint work with Esteban G. Tabak (NYU Courant) and Giulio Trigila (CUNY Baruch).

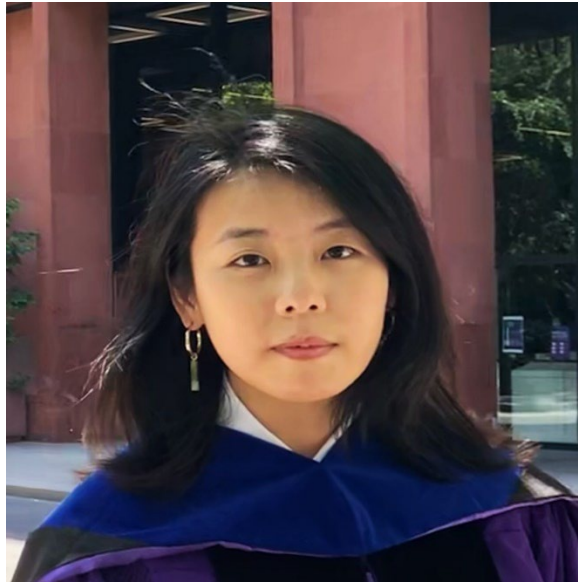
Part two will focus on the application of optimal transport in computational biology, specifically, inference of the underlying dynamical mechanism of gene interactions based on single-cell RNA sequencing datasets. This part is based on joint work with Bjorn Sandstede (Brown) and Ritambhara Singh (Brown).

Refreshments served at 3:30pm 4th floor Lounge – Amos Eaton

Biographical Sketch

Wenjun Zhao is a LFZ Assistant Professor of Applied Mathematics at Brown University, and currently works with Professor Björn Sandstede. Prior to Brown, she received a B.Sc. degree from the University of Science and Technology of China in 2016, and a Ph.D. from the Courant Institute of Mathematical Sciences, New York University in 2021.

Zhao's research interests include optimal transport and its applications in statistics, computational biology, and scientific machine learning.



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