Zikai Xiong

MIT Operations Research Center
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EDUCATION

Massachusetts Institute of Technology, United States (expected) May 2025
Ph.D. in Operations Research

Fudan University, China May 2020
B.S. in Mathematics and Applied Mathematics

RESEARCH EXPERIENCE

Research Assistant, Massachusetts Institute of Technology 2020 – Present
Operations Research Center
Advisor: Professor Robert Freund

- Developed a new cyclic Frank-Wolfe method with superior theoretical results and practical performance for training Machine Learning models. Manuscript in preparation.
- Studying projective transformation methods for convex optimization.

Research Assistant, Shanghai University of Finance and Economics (SUFE) 2018 – 2020
Research Institute for Interdisciplinary Sciences (RIIS)
Advisors: Professor Yinyu Ye (Stanford), Professor Dongdong Ge (SUFE)

- Developed new crossover methods for linear programming (LP), now in a new commercial LP solver that won first place in Hans Mittelmann benchmark of barrier LP solvers. Paper submitted.
- Developed a matrix-based adaptive alternating interior-point method (MAAIPM) to solve the large-scale linear programming subproblems in Wasserstein barycenter problems. Paper published in *NeurIPS* 2019.
- Studied the effects of hidden-city ticketing practices on airline revenues.

HONORS & AWARDS

SIAM Travel Award 2021

Fudan Graduation Star 2020
The highest award of Fudan University for only 10 graduates every year

Outstanding Graduate of Shanghai City 2020

Fudan Outstanding Student Pacesetter Award 2019
The highest annual award of Fudan University for only 10 undergraduate students

National Scholarship 2018
The highest annual scholarship for top students (1%)

First-Class Award of Huadong Cup National Mathematical Modeling Contest 2018

National Scholarship 2017

The highest annual scholarship for top students (1%)

First-Class Award of National College Students Mathematical Competition 2017

PUBLICATIONS

Publications in peer-reviewed outlets:

- Dongdong Ge, Haoyue Wang, **Zikai Xiong**, and Yinyu Ye, "Interior-Point Methods Strike Back: Solving the Wasserstein Barycenter Problem." *NeurIPS 2019*, 6894-6905, 2019.

Submitted:

- Dongdong Ge, Fangkun Qiu, Chengwenjian Wang, **Zikai Xiong**, and Yinyu Ye, "From an Interior Point to a Corner Point: Smart Crossover"
- **Zikai Xiong**, Renjie Xu, Yanwei Xu, and Yimin Wei, "Low-Rank Traffic Matrix Completion with Marginal Information"

In preparation:

- **Zikai Xiong** and Robert Freund, "Improved Complexity and Improved Computation of a Stochastic Frank-Wolfe Method for Huge-Scale Empirical Risk Minimization"
- **Zikai Xiong** and Bo Jiang, "Effect of Hidden-City Ticketing in Revenue Management"

PRESENTATIONS

Oral Presentations:

- "Interior-Point Methods Strike Back: Solving the Wasserstein Barycenter Problem," INFORMS Annual Meeting 2019
- "Computing Wasserstein Barycenter Efficiently: A Structured Linear System and Customized Algorithms," Seminar of New Advances in Theory and Application of ADMM hosted by Shanghai University of Finance and Economics 2019

Poster Presentation:

- "Interior-Point Methods Strike Back: Solving the Wasserstein Barycenter Problem," *NeurIPS* 2019

SERVICE

Reviewer:

ICML (International Conference on Machine Learning), 2021

Teaching Assistant:

RIIS, Shanghai University of Finance and Economics Summer 2019

Held office hours and graded assignments for three different graduate courses:

- Stochastic Modeling
- From Machine Learning to Decision-making: Bandit Learning and Reinforcement Learning
- Stochastic Process and Financial Risk Analysis