

Billy Jin

CONTACT INFORMATION	Purdue University Department of Quantitative Methods Daniels School of Business https://billyzjin.github.io	<i>Email:</i> billyjin@purdue.edu
RESEARCH INTERESTS	Decision-making under uncertainty, online algorithms, stochastic optimization, discrete optimization, approximation algorithms	
EXPERIENCE	Purdue University	2025 - Present
	Assistant Professor in Quantitative Methods Daniels School of Business	
	University of Chicago	2024 - 2025
	Postdoctoral Principal Researcher Advisor: Prof. Baris Ata	
EDUCATION	Cornell University	2018 - 2024
	Ph.D. in Operations Research & Information Engineering Advisor: Prof. David P. Williamson	
	MS in Operations Research & Information Engineering, 2021	
	University of Waterloo	2014 - 2018
	BMath in Combinatorics & Optimization	
AWARDS	INFORMS Decision Analysis Society Best Student Paper Award	2023
	Third Place Poster, YinzOR	2022
	Best Flash Talk, YinzOR	2019
	National Science and Engineering Research Council PGS D Scholarship	2019
	University of Waterloo Alumni Gold Medal	2018
	Combinatorics and Optimization Book Prize, Waterloo	2017
	Big E Prize, Waterloo	2017
	NSERC Undergraduate Student Research Award	2016
	Wish Scholarship	2015, 2016
	René Descartes National Scholarship	2014
	President's Scholarship of Distinction, Waterloo	2014
	Chinese Post-Secondary Education Award, Waterloo	2014

JOURNAL PAPERS Author ordering is alphabetical. Papers listed in reverse chronological order.

- [1] Samuel C. Gutekunst, Billy Jin and David P. Williamson. The Two-Stripe Symmetric Circulant TSP is in *P. Mathematical Programming*, 2026.
 - An earlier version appeared in IPCO 2022.
- [2] Billy Jin, Nathan Klein, and David P. Williamson. A Lower Bound for the Max Entropy Algorithm for TSP. *Mathematical Programming*, 2025.
 - An earlier version appeared in IPCO 2024.

- [3] Billy Jin, Nathan Klein, and David P. Williamson. A $\frac{4}{3}$ -Approximation Algorithm for Half-Integral Cycle Cut Instances of the TSP. *Mathematical Programming*, 2025.
- An earlier version appeared in IPCO 2023.
- [4] Billy Jin, Katya Scheinberg and Miaolan Xie. Sample Complexity Analysis for Adaptive Optimization Algorithms with Stochastic Oracles. *Mathematical Programming*, 2025.
- **Second prize in INFORMS Optimization Society Student Paper Competition.**
- [5] Billy Jin, Katya Scheinberg and Miaolan Xie. High Probability Complexity Bounds for Adaptive Step Search Based on Stochastic Oracles. *SIAM Journal on Optimization*, 2024.
- An earlier version appeared in NeurIPS 2021.
- [6] Yicheng Bai, Omar El Housni, Billy Jin, Paat Rusmevichientong, Huseyin Topaloglu, and David P. Williamson. Fluid Approximations for Revenue Management under High-Variance Demand: Good and Bad Formulations. *Management Science*, 2023.
- [7] Monika Henzinger, Billy Jin, Richard Peng and David P. Williamson. A Combinatorial Cut-Toggling Algorithm for Solving Laplacian Linear Systems. *Algorithmica*, 2023.
- An earlier version appeared in ITCS 2023.

JOURNAL PAPERS
UNDER REVIEW

- [8] Billy Jin and Will Ma. Online Bipartite Matching with Advice: Tight Robustness-Consistency Tradeoffs for the Two-Stage Model. *Minor Revision in Management Science*.
- **Winner of the INFORMS Decision Analysis Society Student Paper Award.**
 - An earlier version appeared in NeurIPS 2022.

CONFERENCE
PAPERS

- [9] Davin Choo, Billy Jin, Yongho Shin. Learning-Augmented Online Bipartite Fractional Matching. *NeurIPS 2025*.
- [10] Billy Jin, Thomas Kesselheim, Will Ma, and Sahil Singla. Sample Complexity of Posted Pricing for a Single Item. *NeurIPS 2024*.
- [11] Daniel Hathcock, Billy Jin, Kalen Patton, Sherry Sarkar, and Michael Zlatin. The Online Submodular Assignment Problem. *FOCS 2024*.
- [12] Siddhartha Banerjee, Vasilis Gkatzelis, Safwan Hossain, Billy Jin, Evi Micha, and Nisarg Shah. Proportionally Fair Allocation of Public and Private Goods. *IJCAI 2023*.
- [13] Siddhartha Banerjee, Vasilis Gkatzelis, Artur Gorokh, and Billy Jin. Online Nash Social Welfare Maximization with Predictions. *SODA 2022*.
- [14] Billy Jin and David P. Williamson. Improved Analysis of Ranking for Online Vertex-Weighted Bipartite Matching in the Random-Order Model. *WINE 2021*.

WORKING PAPERS [15] Monika Henzinger, Billy Jin, Richard Peng and David P. Williamson. Cut-Toggling and Cycle-Toggling for Electrical Flow and Other p-Norm Flows.

[16] Billy Jin, Huseyin Topaloglu, and David P. Williamson. An Approximation Algorithm for Network Revenue Management under Markov-Modulated Demand.

TEACHING
EXPERIENCE

Purdue University

Instructor

- MGMT 30500 (Business Statistics) Fall 2026

Cornell University

Teaching Assistant

- ORIE 3500 (Engineering Probability & Statistics II) Fall 2018
- ORIE 4350 (Introduction to Game Theory) Spring 2019
- ENGRD 2700 (Engineering Probability & Statistics I) Spring 2021

University of Waterloo

Teaching Assistant

- Various courses in the mathematics department. 2014 – 2017

WORK
EXPERIENCE

Jane Street Capital

June – August 2018

Quantitative Trading Intern

- First project: Analyzed trading data to predict how wholesalers give price improvements to retail investor flow
- Second project: Searched for new factors on which to model corporate bond prices to improve existing models

Wish

January – April 2018

Software Engineering Intern

- Analyzed data to better target online ads, awarded most valuable intern.

ACADEMIC
PRESENTATIONS

Learning-Augmented Online Bipartite Fractional Matching

- SIAM Conference on Optimization June 2026
- Purdue CS Theory Seminar October 2025
- Allerton Conference September 2025
- Pomona CS Colloquium September 2025

Optimal Stepsize Schedules for Diffusion Models

- INFORMS Annual Meeting October 2025
- Purdue Quantitative Methods Seminar September 2025
- INFORMS APS Conference July 2025

Advice-Augmented Algorithms for Online Matching and Resource Allocation

Purdue CS Theory Seminar	October 2025
UIUC CS Theory Seminar	April 2025
Purdue Quantitative Methods Seminar	February 2024
UNC Chapel Hill STOR	February 2024
University of Tennessee Knoxville Industrial Engineering	January 2024
UT Austin ORIE	January 2024
MIT Sloan	January 2024
University of Toronto Rotman	January 2024
CMU Tepper	December 2023
UBC Sauder Operations and Logistics	November 2023
Cornell CS Theory Seminar	September 2023

Online Bipartite Matching with Advice: Tight Robustness-Consistency Tradeoffs for the Two-Stage Model

MOPTA, Lehigh University	August 2023
MSOM, Montreal	June 2023
POMS, Orlando	May 2023
Jane Street Graduate Research Fellowship Workshop	April 2023
Cornell Theory Tea	March 2023
NeurIPS, New Orleans	December 2022
INFORMS Annual Meeting, Indianapolis	October 2022
EPFL, Switzerland	July 2022
Revenue Management and Pricing Conference	June 2022

A Combinatorial Cut-Toggling Algorithm for Solving Laplacian Linear Systems.

Conference on Innovations in Theoretical Computer Science (ITCS) January 2023

Online Nash Social Welfare Maximization with Predictions

Cornell Theory Tea	April 2022
SODA	January 2022
INFORMS Annual Meeting	October 2021
Cornell Young Researchers Workshop (poster)	October 2021
MOPTA, Lehigh University	August 2021
EC (poster)	July 2021

A $\frac{4}{3}$ -Approximation Algorithm for Half-Integral Cycle Cut Instances of the TSP

YinzOR, CMU	August 2023
IPCO, UW Madison	June 2023
ACORN, Georgia Tech	March 2023

The Two-Stripe Symmetric Circulant TSP is in P

IPCO, TU Eindhoven July 2022

Improved Analysis of Ranking for Online Vertex-Weighted Bipartite Matching in the Random-Order Model

Conference on Web and Internet Economics (WINE) December 2021

ACADEMIC
SERVICE

Journal Reviewing

Operations Research
Management Science
Mathematics of Operations Research
SIAM Journal on Discrete Mathematics
Operations Research Letters

TheoretCS

Conference Reviewing

APPROX 2025 (Program Committee)

EC 2024, 2025, 2026 (Program Committee)

AAMAS 2025 (Program Committee)

SOSA 2025

NeurIPS 2024

FOCS 2024, 2025

STOC 2024

IPCO 2023, 2026

SODA 2022, 2025, 2026

ESA 2022

SIGMETRICS 2021

EC 2021

Conference and Colloquium Organization

Purdue Quantitative Methods Seminar Organizer, 2026 – Present

Session Chair, INFORMS 2024

Session Chair, INFORMS 2023

Cornell ORIE PhD Colloquium Organizer, 2021-2022