

## Billy Jin

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

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

- [1] Billy Jin, Nathan Klein, and David P. Williamson. A  $\frac{4}{3}$ -Approximation Algorithm for Half-Integral Cycle Cut Instances of the TSP. *To appear, Mathematical Programming.*
  - An earlier version appeared in IPCO 2023.
- [2] Billy Jin, Katya Scheinberg and Miaolan Xie. Sample Complexity Analysis for Adaptive Optimization Algorithms with Stochastic Oracles. *Mathematical Programming*, 2024.

- **Second prize in INFORMS Optimization Society Student Paper Competition.**

[3] 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.

[4] 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.

[5] 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

[6] Billy Jin, Nathan Klein, and David P. Williamson. A Lower Bound for the Max Entropy Algorithm for TSP. *Major Revision in Mathematical Programming*.

- An earlier version appeared in IPCO 2024.

[7] Billy Jin and Will Ma. Online Bipartite Matching with Advice: Tight Robustness-Consistency Tradeoffs for the Two-Stage Model. *Reject and resubmit in Management Science*.

- **Winner of the INFORMS Decision Analysis Society Student Paper Award.**
- An earlier version appeared in NeurIPS 2022.

[8] Samuel C. Gutekunst, Billy Jin and David P. Williamson. The Two-Stripe Symmetric Circulant TSP is in P. *2nd Round Review in Mathematical Programming*.

- An earlier version appeared in IPCO 2022.

#### CONFERENCE PAPERS

[9] Billy Jin, Thomas Kesselheim, Will Ma, and Sahil Singla. Sample Complexity of Posted Pricing for a Single Item. *NeurIPS 2024*.

[10] Daniel Hathcock, Billy Jin, Kalen Patton, Sherry Sarkar, and Michael Zlatin. The Online Submodular Assignment Problem. *FOCS 2024*.

[11] Siddhartha Banerjee, Vasilis Gkatzelis, Safwan Hossain, Billy Jin, Evi Micha, and Nisarg Shah. Proportionally Fair Allocation of Public and Private Goods. *IJCAI 2023*.

[12] Siddhartha Banerjee, Vasilis Gkatzelis, Artur Gorokh, and Billy Jin. Online Nash Social Welfare Maximization with Predictions. *SODA 2022*.

[13] 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

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

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

TEACHING  
EXPERIENCE

**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

Advice-Augmented Algorithms for Online Matching and Resource Allocation

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

Conference on Web and Internet Economics (WINE)	December 2021
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### ACADEMIC SERVICE

#### Journal Reviewing

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

#### Conference Reviewing

APPROX 2025 (Program Committee)  
 EC 2024, 2025 (Program Committee)  
 AAMAS 2025 (Program Committee)  
 SOSA 2025  
 NeurIPS 2024  
 FOCS 2024, 2025  
 STOC 2024  
 IPCO 2023  
 SODA 2022, 2025  
 ESA 2022  
 SIGMETRICS 2021  
 EC 2021

#### Conference and Colloquium Organization

Session Chair, INFORMS 2024  
 Session Chair, INFORMS 2023  
 Cornell ORIE PhD Colloquium Organizer, 2021-2022