Rudy Zhou

rudyzhou@microsoft.com https://rudyzhou.github.io/

Research Interests

I am broadly interested in algorithms and optimization (especially combinatorial and stochastic) in both theory and practice. On the methodological side, I have worked on

- breakthrough algorithms for fundamental optimization problems
- general-purpose technical tools in probability and discrete/continuous optimization, leading to a unified understanding of these problems and new algorithm design approaches

On the applied side, I have led the design and implementation of end-to-end optimization solutions at both Microsoft and the Office of Naval Research. Currently in production:

- a greedy assignment algorithm to allocate cloud computing workloads (demand) to hardware (supply) to balance demand geographically and minimize the need for additional capacity
- an integer programming/column generation-based algorithm for scheduling fleets of naval units that enables more efficient and robust scheduling in the face of disruptions

Experience

Data and Applied Scientist *2025 - present*
Microsoft, Supply Chain Optimization Technologies

Postdoc *2023 - 2025*
Tepper School of Business, Carnegie Mellon University
Advisor: Benjamin Moseley

Research Intern *Summer 2022*
Microsoft Research Redmond, Cloud Operations Research (CORE) group
Mentor: Konstantina Mellou

Education

PhD Algorithms, Combinatorics, and Optimization *2018 - 2023*
Tepper School of Business, Carnegie Mellon University
Advisor: Benjamin Moseley
Winner of 2023 Gerald L. Thompson Doctoral Dissertation Award in Management Science

MS Computer Science *2016 - 2017*
Washington University in St. Louis
Advisor: Brendan Juba

BA Mathematics *2012 - 2016*
Washington University in St. Louis

Publications

Author order is alphabetical by last name unless otherwise noted by (⋆).

Preprints

Franziska Eberle, Thomas Kesselheim, Rudy Zhou
Stochastic Scheduling with General Norms
In preparation.

Benjamin Moseley, Kirk Pruhs, Marc Uetz, Rudy Zhou
Minimizing Completion Times of Stochastic Jobs on Parallel Machines is Hard
In submission. Link

Journal Publications

Franziska Eberle, Anupam Gupta, Nicole Megow, Benjamin Moseley, Rudy Zhou
Configuration Balancing for Stochastic Requests
Mathematical Programming B 2025. Link

Konstantina Mellou, Marco Molinaro, Rudy Zhou
The Power of Migrations in Dynamic Bin Packing
Proceedings of the ACM on Measurement and Analysis of Computing Systems (POMACS) 2024. Link

Anupam Gupta, Benjamin Moseley, Rudy Zhou
Structural Iterative Rounding for Generalized k-Median Problems
Mathematical Programming A 2024. Link

Benjamin Moseley, Kirk Pruhs, Clifford Stein, Rudy Zhou
A Competitive Algorithm for Throughput Maximization on Identical Machines
Mathematical Programming B 2024. Link

Sungjin Im, Benjamin Moseley, Rudy Zhou
The Matroid Cup Game
Operations Research Letters 2021. Link

Rudy Zhou, Han Liu, Tao Ju, Ram Dixit (⋆)
Quantifying the polymerization dynamics of plant cortical microtubules using kymograph analysis
Methods in Cell Biology, 2020. Link

Conference Publications

Anupam Gupta, Benjamin Moseley, Rudy Zhou
Bayesian Probing on Graphs
Integer Programming and Combinatorial Optimization (IPCO) 2026. To appear

Benjamin Moseley, Heather Newman, Kirk Pruhs, Rudy Zhou
Robust Gittins for Stochastic Scheduling
Sigmetrics 2025. Link

Konstantina Mellou, Marco Molinaro, Rudy Zhou
The Power of Migrations in Dynamic Bin Packing
Sigmetrics 2025. Link

Konstantina Mellou, Marco Molinaro, Rudy Zhou
Online Demand Scheduling with Failovers
International Colloquium on Automata, Languages and Programming (ICALP) 2023. Link

Franziska Eberle, Anupam Gupta, Nicole Megow, Benjamin Moseley, Rudy Zhou
Configuration Balancing for Stochastic Requests
Integer Programming and Combinatorial Optimization (IPCO) 2023. Link

Anupam Gupta, Benjamin Moseley, Rudy Zhou
Minimizing Completion Times for Stochastic Jobs via Batched Free Times
Symposium on Discrete Algorithms (SODA) 2023. Link

Benjamin Moseley, Kirk Pruhs, Clifford Stein, Rudy Zhou
A Competitive Algorithm for Throughput Maximization on Identical Machines
Integer Programming and Combinatorial Optimization (IPCO) 2022. Link

Silvio Lattanzi, Benjamin Moseley, Sergei Vassilvitskii, Yuyan Wang, Rudy Zhou
Robust Online Correlation Clustering
Neural Information Processing Systems (NeurIPS) 2021. Link

Anupam Gupta, Benjamin Moseley, Rudy Zhou
Structural Iterative Rounding for Generalized k-Median Problems
International Colloquium on Automata, Languages and Programming (ICALP) 2021. Link

Sungjin Im, Mahshid Montazer Qaem, Benjamin Moseley, Xiaorui Sun, Rudy Zhou
Fast Noise Removal for k-Means Clustering
Artificial Intelligence and Statistics (AISTATS) 2020. Link

Teaching

(Course Designer) *MSBA Machine Learning Fundamentals (Main Instructor)* *Spring 2024 Session 1*
Teaching Evaluations: 4.88/5 Course, 4.91/5 Instruction
Highest teaching evaluation in course history

MBA Calculus Fundamentals (Main Instructor) *Spring 2023 Session 2*
Teaching Evaluations: 3.75/5 Course, 4.75/5 Instruction

MBA Calculus Fundamentals (Main Instructor) *Spring 2022 Session 2*
Teaching Evaluations: 5/5 Course, 5/5 Instruction

MBA Calculus Fundamentals (Main Instructor) *Spring 2022 Session 1*
Teaching Evaluations: 4.8/5 Course, 4.93/5 Instruction

Awards and Honors

Gerald L. Thompson Doctoral Dissertation Award in Management Science *2023*
4 × Provost Conference Fund Award *2020 - 2023*
William Larimer Mellon Fellowship *2018 - 2023*

Invited Talks

Dagstuhl Seminar, Approximation Algorithms for Stochastic Optimization *2025*

Dagstuhl Seminar, Scheduling *2025*

Banff Workshop, Approximation Algorithms and the Hardness of Approximation *2023*

Dagstuhl Seminar, Scheduling *2023*

Combinatorial Optimization and Logistics Seminar, University of Bremen *2022*

Theory Reading Group, Dartmouth College *2022*

Service

Organization: *Session chair for approximation algorithms at INFORMS Annual Meeting 2024*

Program Committee: *Workshop on Models and Algorithms for Planning and Scheduling Problems (MAPSP) 2024*

Journal Reviewer: *Mathematics of Operations Research, Mathematical Programming, Information Processing Letters*

Conference Reviewer: *STOC, SODA, IPCO, ITCS, ICALP, AISTATS, ISAAC, ESA, APPROX, SWAT*