

Daniel Freund

CONTACT INFORMATION	mitmgmtfaculty.mit.edu/dfreund/	dfreund@mit.edu
EMPLOYMENT HISTORY	MIT Sloan School of Management (Assistant Professor) Lyft (Research Fellow) Lyft (Data Scientist Intern) Motivate International (Data Scientist)	(7/2019–) (8/2018–6/2019) (Summer 2017) (2015–2016)
EDUCATION	Cornell University , Ithaca, NY Ph.D., Applied Mathematics, Advisor: Prof. David Shmoys Master of Science, Applied Mathematics University of Warwick , Coventry, UK B.Sc., Mathematics, <i>First Class Honours</i>	(2018) (2016) (2013)
PEER-REVIEWED PUBLICATIONS & PREPRINTS	• “Uniform Loss Algorithms for Online Stochastic Decision-Making With Applications to Bin Packing”, Accepted to <i>SIGMETRICS 2020</i> with S. Banerjee • “Computational Sustainability: Computing for a Better World and a Sustainable Future”, <i>Communications of the ACM</i> with C. Gomes et al. • “Analytics and Bikes: Riding Tandem with Motivate to Improve Mobility”, <i>INFORMS Journal on Applied Analytics</i> 1st Prize: Wagner Prize for Excellence in Operations Research Practice, with S. G. Henderson, E. O’Mahony, D. B. Shmoys. • “Bike Angels: An Analysis of Citi Bike’s Incentives”, <i>ACM SIGCAS Conference on Computing and Sustainable Societies 2018</i> Best Paper Award with H. Chung, D. B. Shmoys. • “Minimizing Multimodular Functions & Allocating Capacity in Bike-Sharing Systems”, <i>IPCO 2017</i>, Major revision at <i>Operations Research</i> Finalist: George Nicholson & POMS ARC Competitions with S. G. Henderson, D. B. Shmoys. • “Pricing and Optimization in Shared Vehicle Systems: An Approximation Framework”, <i>EC 2017</i>, Major revision at <i>Operations Research</i> Finalist: APS Student Paper Competition with S. Banerjee, T. Lykouris. • “Prize-Collecting TSP with a Budget Constraint”, <i>Math of OR</i> (preliminary abstract in <i>ESA 2017</i>) with A. Paul, A. Ferber, D. B. Shmoys, D. P. Williamson. • “Simulation Optimization for a Large-scale Bike-Sharing System”, <i>Winter Simulation Conference 2016</i> with N. Jian, H. M. Wiberg, S. G. Henderson. • “Contagious Sets in Dense Graphs”, <i>European Journal of Combinatorics</i> with M. Poloczek, D. Reichmann. • “Rank Aggregation: New Bounds for MCx”, <i>Discrete Applied Mathematics</i> with D. P. Williamson. • “Secure Physical Computation using Disposable Circuits”, <i>TCC2015</i> with B. Fisch, Moni Naor. • “Physical Zero-Knowledge Proofs of Physical Properties”, <i>CRYPTO2014</i> with B. Fisch, Moni Naor.	

BOOK CHAPTERS	• “Bike Sharing” with Shane G. Henderson, D. B. Shmoys <i>Sharing Economy: Making Supply Meet Demand</i> (Ming Hu, ed.), 2019. • “Data-Driven Rebalancing Methods for Bike-Share Systems” with A. Norouzi-Fard, A. Paul, C. Wang, S. G. Henderson, D. B. Shmoys. <i>Control and Optimization Analytics for the Sharing Economy - New Opportunities for Engineers and Mathematicians</i> (Crisostomi et al., eds.), forthcoming
OTHER WRITING	• “How algorithms and advanced analytics help make bike-share programs run more efficiently“, <i>Scientific American</i>
AWARDS & HONORS	• <i>First Prize</i>, Daniel H. Wagner Prize Competition (2018) • <i>First Prize</i>, George B. Dantzig Dissertation Prize (2018) • <i>Best Paper Award</i>, ACM SIGCAS COMPASS (2018) • <i>Finalist</i>, POMS Applied Research Challenge Competition (2018) • <i>Finalist</i>, George Nicholson Student Paper Competition (2017) • <i>Finalist</i>, APS Student Paper Competition (2017) • Yahoo! Graduate Teaching Award (2014) • Outstanding Teaching Award, Cornell Department of Computer Science (2014) • Scholarship of the German National Merit Foundation (2011 - 2016)
TEACHING EXPERIENCE	MIT, Instructor • 15.761, Introduction to Operations Management (Spring 2020) Cornell University, Instructor • ENGR 1101, Engineering Applications of Operations Research (Spring 2017) • ORIE 5270, Big Data Technologies (Spring 2017) Cornell University, Teaching Assistant • ORIE 6334, Spectral Graph Theory (Grader) Instructor: Prof. David P. Williamson (Fall 2016) • CS 4850, Mathematical Foundations for the Information Age Instructor: Prof. John Hopcroft (Spring 2014) • CS 1110, Introduction to Computing using Python Instructor: Dr. Walker White (Fall 2013)
TALKS & PRESENTATIONS	“Pricing Fast and Slow” • University of Pennsylvania, Networks, Matching, and Platforms Workshop (2020) “Uniform Loss Algorithms for Online Stochastic Decision-Making With Applications to Bin Packing” • CMU, Simons Institute, UMass Amherst (2019) “Smooth Allocation of Surge Pay” • IBM, INFORMS Annual Meeting (2019) “Models and Algorithms for Transportation in the Sharing Economy” • Tel Aviv University (2019) • Stanford University, Columbia University, Fuqua School of Business, Yale School of Management, Northwestern IEMS, Microsoft Research, Anderson School of Management, INFORMS Optimization Conference (2018) • GeorgiaTech ISyE, MIT Sloan (2017) “Pricing and Optimization in Shared Vehicle Systems” • Cornell Workshop for Young Researchers, INFORMS Annual Meeting, INFORMS Marketplace Innovation Workshop, Booth Business School, Cornell CS Theory Seminar, Warwick DIMAP Seminar (2017) “Allocating Capacity in Bike-Sharing Systems”

- IPCO, Conference on Optimization and Optimal Control under Uncertainty, INFORMS Annual Meeting (2017)
- INFORMS Annual Meeting, Annual Conference of the German Operations Research Society, CompSust2016 (Poster) (2016)
- “Contagious Sets in Dense Graphs”
- International Conference on Random Structures and Algorithms (2015)
- “MC4, Copeland and Restart Probabilities”
- Cologne-Twente Workshop on Graphs & Combinatorial Optimization (2015)
- “Zero-Knowledge and Secure Computation of Physical Properties”
- University of Warwick, Seminar (2013)

SERVICE & OUTREACH

Journal Reviewer

- Management Science, Operations Research, Production and Operations Management, Mathematics of Operations Research, Manufacturing and Service Operations Management, INFORMS Journal on Optimization, Networks, Journal of Graph Theory, SIAM Journal on Discrete Mathematics

Program Committees

- EC 2019, The Web Conference 2020, EC 2020

John Hopkins University Center for Talented Youth (CTY), Workshop (2015)

- Organized and ran a workshop on cryptography as part of a CTY-program.

Mathematics Outreach in Ithaca (2016-2018)

- Ran workshops on probability for elementary and middle schools in Tompkins County.

PRESS COVERAGE

- “*AI and incentives see cyclists do the legwork for bike share firms*”, Cycling Industry News, 8/27/2019
- “*Bike-sharing system wins 2018 Wagner Prize*”, Analytics Magazine, 2018
- “*With real-time decisions, Citi Bike breaks the cycle of empty stations*”, Cornell Chronicle, 8/28/2018
- “*Reimagining Bike Sharing: Cornell Researchers Develop Smoother Bike Transport*”, Cornell Daily Sun, 9/4/2018
- “*In New York, It’s a Crush to Find a Citi Bike During Rush*”, Wall Street Journal, 9/15/2016