

Curriculum Vitae

Daniel Freund

Sloan Department:
Operations Management

Month/Year of Birth: September 1990

Place of Birth: Cologne, Germany

Citizenship: German

Immigration Status: Permanent Resident

I. Education

<i>PhD, Applied Mathematics</i>	<i>Cornell University</i>	<i>2018</i>
<i>MSc, Applied Mathematics</i>	<i>Cornell University</i>	<i>2016</i>
<i>BSc, Mathematics</i>	<i>University of Warwick</i>	<i>2013</i>

II. Title of Doctoral Thesis and Name of Thesis Advisor

Models and Algorithms for Transportation in the Sharing Economy
Advisor: David B. Shmoys

III. Principal Field(s) of Interest

Operations Management, Optimization, Analytics, Transportation, Sharing Economy

IV. Name and Rank of other Sloan Faculty in Same Field

<i>Name</i>	<i>Rank</i>
Joann de Zegher	Assistant Professor
Steven Eppinger	Professor
Vivek F. Farias	Professor
Charles Fine	Professor
Negin Golrezaei	Assistant Professor
Stephen C. Graves	Professor
Jónas Oddur Jónasson	Assistant Professor
Retsef Levi	Professor
Georgia Perakis	Professor
Nikos Trichakis	Associate Professor (with Tenure)
Y. Karen Zheng	Associate Professor (with Tenure)

V. Non-MIT Employment

<i>Employer</i>	<i>Position</i>	<i>Start</i>	<i>End</i>
Lyft	Research Fellow	2018	2019
Motivate International	Data Scientist	2015	2015

VI. History of MIT Appointments

<i>Rank</i>	<i>Start</i>	<i>End</i>
Assistant Professor	09/2019	Present

VII. MIT Activities

<i>Committee</i>	<i>Start</i>	<i>End</i>
PhD Admissions Committee (Transportation)	2021	2021
PhD Admissions Committee (ORC)	2021	2021
Wilmers Reappointment Committee	2020	2020
MBA Admissions Committee	2020	2020
 <i>UROB advising</i>		
Sofie Kupiec	2020	2021
Elizabeth A. Obermaier	2020	2021

VIII. Governmental Committees and Service

IX. Consulting Activities

X. Other Activities

XI. Awards

	<i>Date</i>
INFORMS Wagner Prize for Excellence in OR and Analytics (Finalist)	2020
INFORMS Wagner Prize for Excellence in OR and Analytics (First Prize)	2018
Best Paper Award, ACM SIGCAS Computing and Sustainable Societies	2018
INFORMS George B. Dantzig Dissertation Award (First Prize)	2018
POMS Applied Research Challenge (Finalist)	2018
INFORMS Applied Probability Society Student Paper Competition (Finalist)	2017
INFORMS George Nicholson Student Paper Competition (Finalist)	2017

XII. Professional Membership and Activities

Memberships

The Institute for Operations Research and the Management Sciences (INFORMS)
Society for Industrial and Applied Mathematics (SIAM)
Association for Computing Machinery (ACM)

Conference Program Committees

ACM Conference on Economics and Computation (EC)	2019, 2020, 2021
ACM EC Workshop on Design of Online Platforms	2021
ACM EC Workshop on the Operation of People-Centric Operations	2021
Mechanism Design for Social Good Workshop (MD4SG)	2020
The Web Conference (WebConf)	2020

Award Committees

MSOM Best Student Paper Prize Committee	2021
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XIII. Subjects Taught

15.764	<i>Theory of Operations Management</i>	<i>Spring 2021</i>
15.066	<i>System Optimization and Analysis for Operations</i>	<i>Summer 2020, 2021</i>
15.761	<i>Introduction to Operations Management (2 sections)</i>	<i>Spring 2020</i>

XIV. Thesis Supervision

1. Doctoral Theses Supervised

2. Master's Theses Supervised

Gulsagar Singh Jassar (supervisor)	SDM	MSc	2021
Katherine Suzanne Rawden	LGO	MBA/MSc	2021

3. Bachelor's Theses Supervised

4. Theses in Progress

Jiayu (Kamessi) Zhao	ORC	PhD	2025
Gustavo Castillo	LGO	MBA/MSc	2022
Michael J. Lunny	LGO	MBA/MSc	2022
Wren Jiang	LGO	MBA/MSc	2022

XV. Publications (*including order of co-authors, if any*)

* Authors in alphabetical order as per convention of the field

1. Theses

Models and Algorithms for Transportation in the Sharing Economy

2. Refereed Journal Articles

* Banerjee, Siddhartha, Daniel Freund, and Thodoris Lykouris. "Pricing and Optimization in Shared Vehicle Systems: An Approximation Framework," Accepted in *Operations Research*.

Ong, HaoYi, Daniel Freund, and Davide Crippis. "Driver Positioning and Incentive Budgeting with an Escrow Mechanism for Ridesharing Platforms," Accepted in *INFORMS Journal on Applied Analytics*.

Paul, Alice, Daniel Freund, Aaron Ferber, David B. Shmoys, and David P. Williamson. "Budgeted Prize-Collecting Traveling Salesman and Minimum Spanning Tree Problems." *Mathematics of Operations Research* 45, no. 2 (2020): 576-590.

* Freund, Daniel, Shane G. Henderson, Eoin O'Mahony, and David B. Shmoys. "Analytics and Bikes: Riding Tandem with Motivate to Improve Mobility." *INFORMS Journal on Applied Analytics* 49, no. 5 (2019): 310-323.

Carla Gomes et al. "Computational sustainability: Computing for a better world and a sustainable future." *Communications of the ACM* 62, no. 9 (2019): 56-65.

* Freund, Daniel, and David P. Williamson. "Rank aggregation: New bounds for MCx." *Discrete Applied Mathematics* 252 (2019): 28-36.

* Freund, Daniel, Matthias Poloczek, and Daniel Reichman. "Contagious sets in dense graphs." *European Journal of Combinatorics* 68 (2018): 66-78.

3. Articles in Refereed Conference Proceedings

* Freund, Daniel, and Jiayu Zhao. "Overbooking with bounded loss." In Proceedings of the ACM Conference on Computation and Economics. 2021. *Acceptance rate: 26%*

* Banerjee, Siddhartha, and Daniel Freund. "Uniform Loss Algorithms for Online Stochastic Decision-Making With Applications to Bin Packing." In Proceedings of the ACM SIGMETRICS Conference. 2020. *Acceptance rate: 18%*

* Chung, Hangil, Daniel Freund, and David B. Shmoys. "Bike Angels: An Analysis of Citi Bike's Incentive Program." In Proceedings of the 1st ACM SIGCAS Conference on Computing and Sustainable Societies, pp. 1-9. 2018. *Best paper out of 25 accepted submissions*

Paul, Alice, Daniel Freund, Aaron Feber, David B. Shmoys, David P. Williamson. "Prize-collecting TSP with a budget constraint." In Proceedings of the 25th Annual European Symposium on Algorithms. 2017. *Acceptance rate: 25%*

* Banerjee, Siddhartha, Daniel Freund, and Thodoris Lykouris. "Pricing and Optimization in Shared Vehicle Systems: An Approximation Framework." In Proceedings of the ACM Conference on Computation and Economics. 2017. *Acceptance rate: 29%*

* Freund, Daniel, Shane G. Henderson, David B. Shmoys. "Minimizing Multimodular Functions and Allocating Capacity in Bike-sharing Systems." In Proceedings of the International Conference on Integer Programming and Combinatorial Optimization. *Acceptance rate: 29%*

Jian, Nanjing, Daniel Freund, Holly M. Wiberg, and Shane G. Henderson. "Simulation Optimization for a Large-scale Bike-Sharing System." In Proceedings of the 2016 Winter Simulation Conference, pp. 602-613. 2016. *Acceptance rate: 67%*

* Fisch, Ben A., Daniel Freund, and Moni Naor. "Secure physical computation using disposable circuits." In Theory of Cryptography Conference, pp. 182-198. Springer, Berlin, Heidelberg, 2015. *Acceptance rate: 26%*

* Fisch, Ben, Daniel Freund, and Moni Naor. "Physical zero-knowledge proofs of physical properties." In Annual Cryptology Conference, pp. 313-336. Springer, Berlin, Heidelberg, 2014. *Acceptance rate: 33%*

4. Articles in Non-Refereed Conference Proceedings

5. Papers/Articles in Progress or Under Review

* Freund, Daniel, Shane G. Henderson, and David B. Shmoys. "Minimizing Multimodular Functions and Allocating Capacity in Bike-sharing Systems," Under review. Available at ArXiv 1611.09304 (2020).

* Banerjee, Siddhartha, and Daniel Freund. "Good prophets know when the end is near," Under review. Available at SSRN 3479189 (2020).

* Freund, Daniel and Garrett J. van Ryzin. "Pricing Fast and Slow: The Inefficiency of Dynamic Pricing in Ridehailing Systems," Under review.

* Freund, Daniel, and Chamsi Hssaine. "Earning sans learning: The role of limited information for labor supply in the gig economy," Under review.

* Freund, Daniel, and Jiayu (Kamessi) Zhao. "Overbooking with bounded loss," Under review.

* Asadpour, Arash, John Fremlin, Daniel Freund, and Garrett J. van Ryzin. "A demand-agnostic Mechanism to Smooth Driver Pay in a Ride Hailing System," In preparation.

6. Other Publications

Freund, Daniel, Ashkan Norouzi-Fard, Alice Paul, Carter Wang, Shane G. Henderson, and David B. Shmoys. "Data-driven rebalancing methods for bike-share systems." In *Analytics for the Sharing Economy: Mathematics, Engineering and Business Perspectives*, pp. 255-278. Springer, Cham, 2020.

* Freund, Daniel, Shane G. Henderson, and David B. Shmoys. "Bike sharing." In *Sharing Economy*, pp. 435-459. Springer, Cham, 2019.

7. Technical Reports

XVI. Invited Oral Presentations

"From 2 Wheels to 4: Design and Optimization of Shared Transportation Platforms," MIT ILP Webinar, 2020.

"The Inefficiency of Dynamic Pricing in Ridehailing Systems," MIT Mobility Forum, 2020.

"The Inefficiency of Dynamic Pricing in Ridehailing Systems," MIT IDE Seminar, 2020.

"The Inefficiency of Dynamic Pricing in Ridehailing Systems," University of Cologne, 2020 – canceled.

"The Inefficiency of Dynamic Pricing in Ridehailing Systems," ESMT, Operations Management, 2020 – canceled.

"The Inefficiency of Dynamic Pricing in Ridehailing Systems," Wharton School of the University of Pennsylvania, Operations Management, 2020.

"The Inefficiency of Dynamic Pricing in Ridehailing Systems," Networks, Matching, and Platforms Workshop, Ontario, 2020.

"Uniform Loss Algorithms for Online Stochastic Decision-Making With Applications to Bin Packing," UMass Amherst, Discrete Mathematics Seminar, 2019.

"Uniform Loss Algorithms for Online Stochastic Decision-Making With Applications to Bin Packing," UC Berkeley, Simons Institute for the Theory of Computing, 2019.

"Uniform Loss Algorithms for Online Stochastic Decision-Making With Applications to Bin Packing," Carnegie Mellon University, Plenary at YinzOR Student Conference, 2019.

"Models and Algorithms for Transportation in the Sharing Economy," Tel Aviv University, Industrial Engineering, 2019.

“A demand-agnostic Mechanism to Smooth Driver Pay in a Ride Hailing System,” Brownbag Seminar at IBM Research, 2019.

“Models and Algorithms for Transportation in the Sharing Economy,” Yale School of Management, Operations Management, 2018.

“Pricing and Optimization in Shared Vehicle Systems,” Booth School of Business at Chicago University, 2018.

“Models and Algorithms for Transportation in the Sharing Economy,” Columbia University, IEOR/DRO Seminar, 2018.

“Models and Algorithms for Transportation in the Sharing Economy,” Stanford University, Management Science & Engineering, 2018.

“Models and Algorithms for Transportation in the Sharing Economy,” Anderson School of Management at UCLA, 2018.

“Models and Algorithms for Transportation in the Sharing Economy,” Massachusetts Institute of Technology, Operations Research and Statistics, 2018.

“Models and Algorithms for Transportation in the Sharing Economy,” Stanford University, Graduate School of Business, 2018.

“Models and Algorithms for Transportation in the Sharing Economy,” Northwestern University, Industrial Engineering and Management Sciences, 2018.

“Models and Algorithms for Transportation in the Sharing Economy,” Microsoft Research, Seattle, 2018.

“Models and Algorithms for Transportation in the Sharing Economy,” Fuqua Business School at Duke University, 2018.

“Models and Algorithms for Transportation in the Sharing Economy,” Georgia Institute of Technology, Industrial and Systems Engineering, 2017.

“Models and Algorithms for Transportation in the Sharing Economy,” Massachusetts Institute of Technology, Operations Management, 2017.

“Pricing and Optimization in Shared Vehicle Systems,” DIMAP Seminar at the University of Warwick, 2017.

“Pricing and Optimization in Shared Vehicle Systems,” CS Theory Seminar at Cornell University, 2017.