

Ali Makhdoumi

Contact Information

Duke University, Fuqua School of Business
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Academic Positions

Duke University, Fuqua School of Business, Durham, NC
Associate Professor (with tenure), Decision Sciences July 2025 - present
Associate Professor (without tenure), Decision Sciences July 2022 - July 2025
Assistant Professor, Decision Sciences August 2018 - July 2022

Duke University, Department of Computer Science, Durham, NC
Associate Professor (secondary appointment) July 2024 - present

Simons Institute for the Theory of Computation, UC Berkeley, CA
Visiting scholar Fall 2022

Education

Massachusetts Institute of Technology, Cambridge, MA 2013 - 2018
Ph.D., Department of Electrical Engineering and Computer Science
Dissertation title: Information provision in rating systems and traffic systems
Thesis Advisors: Prof. Asuman Ozdaglar, Prof. Daron Acemoglu

Massachusetts Institute of Technology, Cambridge, MA 2011 - 2013
M.S., Department of Electrical Engineering and Computer Science

Sharif University of Technology, Tehran, Iran 2006 - 2011
B.Sc. in Pure Mathematics
B.Sc. in Electrical Engineering, Communications

Research Interests

Optimization, game theory, stochastic modeling, and learning theory with applications to social and technological systems, market design, platform operations, and data markets.

Working Papers

1. Saeed Alaei, Ali Daei Naby, Ali Makhdoumi, and Azarakhsh Malekian, Incentivizing Data Collaboration: A Mechanism Design Approach, Working paper
2. Alexander Belloni, Xuanjie Li, Ali Makhdoumi, Approximately Optimal Online Mechanism for Multiunit Demand Buyers with Post-Allocation Inspection, **Accepted to EC 2025**, Working paper
3. Xuanjie Li, Ali Makhdoumi, Sasa Pekec, Mechanism Design with Post-Allocation Inspection and Exclusion Penalties, Working paper
4. Alireza Fallah, Michael Jordan, Ali Makhdoumi, and Azarakhsh Malekian, On Three-Layer Data Markets, Working paper
5. Alireza Fallah, Michael Jordan, Ali Makhdoumi, and Azarakhsh Malekian, The Limits of Price Discrimination Under Privacy Constraints, Working paper
6. Jackie Baek, Ali Makhdoumi, The Feedback Loop of Statistical Discrimination, Working paper
7. Daron Acemoglu, Alireza Fallah, Ali Makhdoumi, Azarakhsh Malekian, and Asuman Ozdaglar, How Good Are Privacy Guarantees? Platform Architecture and Violation of User Privacy, **Accepted to WINE 2023**, Working paper
8. Saeed Alaei, Shuchi Chawla, Azarakhsh Makhdoumi, and A. Malekian, Countering Value Uncertainty via Refunds: A Mechanism Design Approach, Working paper

9. Saeed Alaei, Ali Makhdoumi, Azarakhsh Malekian, and Rad Niazadeh, Descending Price Auctions with Bounded Number of Price levels and Batched Prophet Inequality, **Accepted to EC 2022**, Working paper

Published Papers

1. Daron Acemoglu, Ali Makhdoumi, Azarakhsh Malekian, and Asuman Ozdaglar, When Big Data Enables Behavioral Manipulation, **AER:Insights**, 2025
Media coverage: Brookings.edu and Fuqua Insights
2. Ayoub Amil, Ali Makhdoumi, and Yehua Wei, Multi-Item Order Fulfillment Revisited: LP Formulation and Prophet Inequality, **Accepted to EC 2023, Management Science**, 2025
Finalist of the 2022 Jeff McGill Student Paper Award
3. Saeed Alaei, Ali Makhdoumi, and Azarakhsh Malekian, Revenue Maximization under Unknown Private Values with Non-Obligatory Inspection, **Operations Research**, 2024
4. Saeed Alaei, Alex Belloni, Ali Makhdoumi, and Azarakhsh Malekian, Optimal Auction Design with Deferred Inspection and Reward, **Operations Research**, 2024
5. Alireza Fallah, Ali Makhdoumi, Azarakhsh Malekian, and Asuman Ozdaglar, Optimal and Differentially Private Data Acquisition: Local and Central Mechanisms, **Operations Research**, 2023
6. Saeed Alaei, Ali Makhdoumi, and Azarakhsh Malekian, Optimal Subscription Planning for Digital Goods, **Operations Research**, 2023
7. Daron Acemoglu, Ali Makhdoumi, Azarakhsh Malekian, and Asuman Ozdaglar, Testing, Voluntary Social Distancing, and the Spread of an Infection, **Operations Research**, 2023
8. Kimon Drakopoulos and Ali Makhdoumi, Providing Data Samples for Free, **Management Science**, 2022
9. Saeed Alaei, Ali Makhdoumi, Azarakhsh Malekian, and Sasa Pekec, Revenue-Sharing Allocation Strategies for Two-Sided Media Platforms: Pro-Rata versus User-Centric, **Management Science**, 2022
10. Daron Acemoglu, Ali Makhdoumi, Azarakhsh Malekian, and Asuman Ozdaglar, Learning From Reviews: The Selection Effect and the Speed of Learning, **Econometrica**, 2022
11. Daron Acemoglu, Ali Makhdoumi, Azarakhsh Malekian, and Asuman Ozdaglar, Too Much Data: Prices and Inefficiencies in Data Markets, **American Economic Journal: Microeconomics**, 2022

Media coverage: VoxEU and Fuqua Insights
Cited in the **2023 Economic Report of the President**
12. Saeed Alaei, Ali Makhdoumi, and Azarakhsh Malekian, Maximizing Sequence-Submodular Functions and its Application to Online Advertising, **Management Science**, 2021
13. Daron Acemoglu, Ali Makhdoumi, Azarakhsh Malekian, and Asuman Ozdaglar, Informational Braess' Paradox: the Effect of Information on Traffic Congestion, **Operations Research**, 2018
14. Daron Acemoglu, Ali Makhdoumi, Azarakhsh Malekian, and Asuman Ozdaglar, Privacy-aware Network Formation, **Games and Economic Behavior**, 2017
15. Ali Makhdoumi and Asuman Ozdaglar, Convergence Rate of Distributed ADMM over Networks, **IEEE Transactions on Automatic Control**, 2017
16. Flavio Calmon, Ali Makhdoumi, Muriel Médard, Mayank Varia, Mark Christiansen, and Ken Duffy, Principal Inertia Components and Applications, **IEEE Transactions on Information Theory**, 2017
17. Soheil Feizi, Ali Makhdoumi, Ken Duffy, Manolis Kellis, and Muriel Médard, Network Maximal Correlation, **IEEE Transactions on Network Science and Engineering**, 2017

1. S. Alaei, S. Chawla, Z. Huang, A. Makhdoumi, A. Malekian, Deterministic Refund Mechanisms, SAGT 2025
2. A. Belloni, X. Li, A. Makhdoumi, Approximately Optimal Online Mechanism for Multiunit Demand Buyers with Post-Allocation Inspection, ACM Conference on Economics and Computation, 2025
3. D. Acemoglu, A. Fallah, A. Makhdoumi, A. Malekian, and A. Ozdaglar, How Good Are Privacy Guarantees? Platform Architecture and Violation of User Privacy, Conference on Web and Internet Economics (WINE), 2023
4. A. Amil, A. Makhdoumi, and Y. Wei, Multi-Item Order Fulfillment Revisited: LP Formulation and Prophet Inequality, ACM Conference on Economics and Computation, 2023
5. A. Fallah, A. Makhdoumi, A. Malekian, and A. Ozdaglar, Bridging Central and Local Differential Privacy in Data Acquisition Mechanisms, NeurIPS, 2022
6. S. Alaei, A. Makhdoumi, A. Malekian, R. Niazadeh, Descending Price Auctions with Bounded Number of Price Levels and Batched Prophet Inequality, ACM Conference on Economics and Computation, 2022
7. A. Fallah, A. Makhdoumi, A. Malekian, A. Ozdaglar, Optimal and Differentially Private Data Acquisition: Central and Local Mechanisms, ACM Conference on Economics and Computation, 2022
8. S. Alaei, A. Makhdoumi, and A. Malekian, Revenue Maximization under Unknown Private Values with Non-Obligatory Inspection, ACM Conference on Economics and Computation, 2021
9. A. Makhdoumi, A. Malekian, A. Ozdaglar, Optimal Dynamic Pricing of Network Goods, Allerton Conference on Communication, Control, and Computing, 2017
10. A. Rezaee, A. Beirami, A. Makhdoumi, M. Médard, K. Duffy, Guesswork Subject to a Total Entropy Budget, Allerton, 2017
11. A. Makhdoumi, A. Ozdaglar, Graph Balancing for Distributed Subgradient Methods over Directed Graphs, IEEE Conference on Decision and Control (CDC), 2015
12. A. Makhdoumi, F. Calmon, and M. Médard, Forgot Your Password: Correlation Dilution, International Symposium on Information Theory (ISIT), 2015
13. F. Calmon, A. Makhdoumi, M. Médard, Fundamental Limits of Perfect Privacy, International Symposium on Information Theory (ISIT), 2015
14. A. Makhdoumi, S. Huang, M. Médard, Y. Polyanskiy, On Locally Decodable Source Coding, International Communication Conference (ICC), 2015
15. A. Beirami, R. Calderbank, M. Christiansen, K. Duffy, A. Makhdoumi, M. Médard, A geometric perspective on guesswork, Allerton, 2015
16. A. Makhdoumi, A. Ozdaglar, Broadcast-based Distributed Alternating Direction Method of Multiplier, Allerton, 2014
17. A. Makhdoumi, S. Salamatian, N. Fawaz, M. Médard, From Information Bottleneck to Privacy Funnel, Information Theory Workshop (ITW), 2014
18. S. Feizi, D. E. Lucani, C. W. Sorensen, A. Makhdoumi, M. Médard, Tunable Sparse Network Coding for Multicast Networks, Workshop on Network Coding and Applications, 2014
19. U. Speidel, T. A. Gulliver, A. Makhdoumi, M. Médard, Using T-codes as Locally Decodable Source Codes, ITW, 2014
20. A. Makhdoumi, N. Fawaz, Utility-Privacy Trade-off under Statistical Uncertainty, Allerton, 2013
21. A. Makhdoumi, H. K. Abadi, P. Pad, H. Saeedi, F. Marvasti, K. Alishahi, Capacity Achieving Linear Codes with Random Binary Sparse Generating Matrices, ISIT, 2012

Patents

1. A. Makhdoumi and N. Fawaz, Methods and apparatus for utility-aware privacy preserving mapping through additive noise
2. A. Makhdoumi and N. Fawaz, Method and apparatus for utility-aware privacy preserving mapping against inference attacks
3. A. Makhdoumi and N. Fawaz, Method and apparatus for utility-aware privacy preserving mapping in view of collusion and composition

Invited Talks & Conference Presentations

- Optimal Auction Design with Deferred Inspection
 - UNC, Kenan-Flagler Business School
 - USC, Marshall School of Business, 2023
 - Duke University, Department of Computer Science, 2024
- Revenue Management with Inspection
 - Chicago Booth School of Business, 2023
 - Rotman School of Management, 2023
- Too Much Data: Prices and Inefficiencies in Data Markets
 - Keynote talk at *Workshop on User Safety in AI and Finance*, 2022
- Testing, Voluntary social distancing, and the spread of a virus
 - Simons Institute for the Theory of Computing, October, 2022
- Optimal Auction Design with Deferred Inspection and Reward
 - INFORMS Annual Meeting, 2022
- Revenue Maximization under Unknown Private Values with Non-Obligatory Inspection
 - RMIT University, Australia, 2022
 - Rotman School of Management, Young scholars workshop, 2022
 - INFORMS Annual Meeting, 2021
- A Model of Behavioral Manipulation
 - INFORMS Annual Meeting, 2021
- Sequence-submodular Maximization and its Application to Online Advertising
 - The University of Minnesota, ISyE, 2021
- Too Much Data: Prices and Inefficiencies in Data Markets
 - INFORMS Annual Meeting, 2020
- Optimal Subscription Planning for Digital Goods
 - Workshop on Matching and Platforms, Orlando, 2020
 - INFORMS Annual Meeting, Seattle, Washington, 2019
 - Market Design and Innovation Workshop, Stanford, CA, Summer, 2019
- Learning From Reviews: The Selection Effect and the Speed of Learning
 - The Olin Business School, St. Louis University, January, 2019
- Fast and Slow Learning from Reviews:
 - Michigan University, November, 2018
 - INFORMS Annual Meeting, October 2018

- The Fuqua School of Business, Duke University, January, 2018
- The University of Chicago Booth School of Business, January, 2018
- The Columbia Business School, January, 2018
- The Stanford Graduate School of Business, January, 2018
- The Yale School of Management, February, 2018
- Rady School of Business, February, 2018
- Berkeley Electrical Engineering and Computer Science Department, March, 2018
- CMU Machine Learning Department, March, 2018
- Cornell Electrical and Computer Engineering Department, March, 2018
- INFORMS Annual Meeting, Houston, Texas, October 2017
- The Wharton School of the University of Pennsylvania, December, 2017
- Strategic Dynamic Pricing with Network Effects:
 - INFORMS Annual Meeting, Houston, Texas, October 2017
 - Production and Operations Management Society (POMS) Annual Conference, Seattle, Washington, May 2017
 - Conference on Communication, Control, and Computing (Allerton), Champaign, Illinois, October 2017
- Informational Braess' Paradox: the Effect of Information on Traffic Congestion:
 - INFORMS Annual Meeting, Nashville, Tennessee, November 2016
 - Conference on Communication, Control, and Computing (Allerton), Champaign, Illinois, September 2016
- Privacy-constrained Network Formation:
 - INFORMS Annual Meeting, Philadelphia, Pennsylvania, November 2015
 - Workshop on the Economics of Networks, Systems and Computation (NetEcon), Portland, Oregon, June 2015
- Convergence Rate of Distributed ADMM over Networks:
 - INFORMS Annual Meeting, Philadelphia, Pennsylvania, November 2015
 - Modeling and Optimization: Theory and Applications Conference (MOPTA), Bethlehem, Pennsylvania, July 2015

Teaching

- Decision Models, **MBA and WEMBA programs**, Fuqua School of Business
- Spreadsheet Modeling & Decision Analysis, **MMS program**, Fuqua School of Business
- Probability and Statistics, **MQM program**, Fuqua School of Business
- Convex Optimization, **PhD program**, Fuqua School of Business

Professional Services

- **Service at Duke:**
 - Serving on the Curriculum Committee, Fuqua School of Business, 2025
 - (Co-)supervisor:
 - Ayoub Amil, Decision Sciences, graduated in 2024
 - Minjun Chang, Decision Sciences, graduated in 2023
 - Xuanjie Li, Decision Sciences, ongoing
 - PhD dissertation committee/preliminary exam committee:
 - Yi Shen, Department of Mechanical Engineering and Materials Science
 - James Scott, Operations Management
 - Cagin Uru, Decision Sciences, Fuqua School of Business
 - Yuan-Mao Kao, Operations Management
 - Huseyin Gurkan, Decision Sciences
 - Yunke Mai, Decision Sciences
 - Co-organizer of the seminar series on Data, Markets, and Information jointly with the Computer Science Department, 2023
 - Seminar Organizer of Decision Sciences, 2020, 2021, 2022, 2023, 2024
 - Committee for evaluating first-year PhD students, Decision Sciences, 2019, 2020
 - PhD admission committee, Decision Sciences, 2019, 2021, 2022, 2023, 2024
 - Co-organizer of the Fuqua Faculty Summer Seminar Series in 2021
- **Service outside of Duke:**
 - **Associate Editor, Markets, Platforms, and Revenue Management department, Operations Research, 2025**
 - **Associate Editor, Revenue Management and Market Analytics (RMMA) department, Naval Research Logistics (NRL), 2023**
 - Distinguished Service Award, Operations Research Journal, 2025
 - Referee for Elwood S. Buffa Doctoral Dissertation Award, 2019
 - Co-organizer of a workshop on the frontier of games, optimization, networks, machine learning and operations, MIT, 2023
 - Discussant at the INFORMS Revenue Management and Pricing (RMP) Section Conference, 2022
- **Senior Program Committee Member:**
 - Conference on Economics and Computation (EC): 2023, 2024, 2025
 - Conference on Web and Internet Economics (WINE): 2022, 2023
 - The Web Conference (WWW), 2025
- **Technical Program Committee Member:**
 - Conference on Economics and Computation (EC): 2019, 2020, 2021, 2022
 - The Web Conference (WWW): 2020, 2021
 - Conference on Algorithmic Decision Theory (ADT 2019) at Duke University
 - Global Conference on Signal and Information Processing: 2016, 2017, and 2018
- **Referee for Journals:** Operations Research, Management Science, Review of Economic Studies, Econometrica, Journal of Political Economy, American Economic Journal: Micro, Manufacturing & Service Operations Management, Production and Operations Management, Mathematics of Operations Research, Journal of Machine Learning Research, Discrete Optimization, Networks, IEEE Transactions on Network Science and Engineering, IEEE Transactions

on Information Theory, IEEE Transactions on Automatic Control, IEEE Transactions on Signal Processing, IEEE Transactions on Information Forensics and Security, Automatica journal of the International Federation of Automatic Control, IEEE Transactions on Communications.

- **Referee and Sub-referee for Conferences:** ACM Symposium on Theory of Computing (STOC), ACM Conference on Economics and Computation (EC), ACM-SIAM Symposium on Discrete Algorithms (SODA), Wold Wide Web Conference (WWW), IEEE Conference on Decision and Control (CDC), American Control Conference (ACC).