Nikhil Garg

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ACADEMIC EMPLOYMENT

Assistant Professor, Operations Research and Information Engineering Fall 2021-Present
Jacobs Institute
Cornell Tech and Technion - IIT
Field member in ORIE, Computer Science, and Information Science, Cornell University

Postdoctoral Associate 2020-2021
University of California, Berkeley
Department of Electrical Engineering and Computer Sciences
Hosts: Christian Borgs, Jennifer Chayes, & Mike Jordan

EDUCATION

Stanford University
MS/PhD, Electrical Engineering 2020
Thesis: *Designing Marketplaces and Civic Engagement Platforms: Learning, Incentives, and Pricing*
National Science Foundation Graduate Research Fellowship
Crowdsourced Democracy Team and Society & Algorithms Lab
Advisors: Ashish Goel & Ramesh Johari

University of Texas at Austin
BS, Computer Engineering, Highest and Special Honors 2015
BA, Plan II Honors (Liberal Arts) 2015

SELECTED AWARDS

- NSF CAREER, 2024
- Forbes 30 under 30 for Science, 2022
- INFORMS George Dantzig Dissertation Award, 2020
- ACM SIGecom Dissertation Award (Honorable Mention), 2021
- **Paper awards:** INFORMS Junior Faculty Interest Group (Finalist), 2023; M&SOM Student (2nd place), 2020; INFORMS DEI Student, 2022; ACM EAAMO Student, 2021; ML4H Best Findings (Honorable Mention), 2023
- **Other grants:** Amazon, Meta, and Cornell Tech Urban Tech research awards
- National Science Foundation Graduate Research Fellowship, 2015-2020
- Stanford McCoy Center for Ethics in Society Graduate Fellow, 2017-2018

PUBLICATIONS

Working Papers

7. "Learning Graph Neural Networks from Biased Outcome Data." Sidhika Balachandar, Shuvom Sadhuka, Bonnie Berger, Emma Pierson, and **NG**. *ICML 2024 Workshop on Structured Probabilistic Inference & Generative Modeling.*

6. "Bayesian Disease Progression Modeling That Captures And Accounts For Health Disparities ." Erica Chiang, Ashley N. Beecy, Gabriel Sayer, Nir Uriel, Deborah Estrin, **NG**, and Emma Pierson. *ICML 2024 Workshop on Structured Probabilistic Inference & Generative Modeling* and *2024 Machine Learning for Health Symposium.*

5. "Choosing the Right Weights: Balancing Value, Strategy, and Noise in Recommender Systems." Smitha Milli, Emma Pierson, and **NG**.

4. "Shopping Around: An Experiment in Preferences and Incentives for Placing Long-term Patients." Vince Bartle, Nicki Dell, and **NG**.

3. "Optimal Strategies in Ranked-Choice Voting." Sanyukta Deshpande, **NG**, and Sheldon Jacobson.

2. "Detecting Disparities in Capacity-constrained Allocations." Benjamin Laufer, Emma Pierson, and **NG**.

1. "Dropping Standardized Testing for Admissions Trades Off Information and Access." **NG**, Hannah Li, and Faidra Monachou. *Major Revision at Management Science.*

Journal Articles

6. "Quantifying Spatial Under-reporting Disparities in Resident Crowdsourcing" (2023) Zhi Liu, Uma Bhandaram, and **NG**. *Nature Computational Science.*

    INFORMS Junior Faculty Interest Group Paper Award (Finalist), 2023

5. "Driver Surge Pricing" (2021). **NG** and Hamid Nazerzadeh. *Management Science (MS).*

4. "Markets for Public Decision-making" (2020). **NG**, Ashish Goel, and Ben Plaut. *Social Choice and Welfare.*

3. "Designing Informative Rating Systems: Evidence from an Online Labor Market" (2020). **NG** and Ramesh Johari. *Manufacturing & Service Operations Management (M&SOM).*

    M&SOM Student Paper Award (2nd place), 2020

    Media: *New York Times*, *Stanford Engineering Magazine*

2. "Iterative Local Voting for Collective Decision-making in Continuous Spaces" (2019). **NG**, Vijay Kamble, Ashish Goel, David Marn, and Kamesh Munagala. *Journal of Artificial Intelligence Research (JAIR).*

1. "Word Embeddings Quantify 100 Years of Gender and Ethnic Stereotypes" (2018). **NG**, Londa Schiebinger, Dan Jurafsky, and James Zou. *Proceedings of the National Academy of Sciences (PNAS).*

    Media: *Science Magazine*, *Smithsonian Magazine*, *Stanford News*

Peer Reviewed Conference Proceedings

36. "Faster Information for Effective Long-Term Discharge: A Field Study in Adult Foster Care." Vince Bartle, Nicola Dell and **NG**. *ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW'25).*

35. "A No Free Lunch Theorem for Human-AI Collaboration." Kenny Peng, **NG**, and Jon Kleinberg. *AAAI Conference on Artificial Intelligence (AAAI'25)*

34. "Balancing Producer Fairness and Efficiency via Bayesian Rating System Design." Thomas Ma, Michael Bernstein, Ramesh Johari, and **NG**. *International AAAI Conference on Web and Social Media (ICWSM'25)*

33. "Monoculture in Matching Markets." Kenny Peng and **NG**. *Thirty-eight Conference on Neural Information Processing Systems (NeurIPS '24)*

32. "User-item fairness tradeoffs in recommendations." Sophie Greenwood, Sudalakshmee Chiniah, and **NG**. *Thirty-eight Conference on Neural Information Processing Systems (NeurIPS '24)*

31. "Ending Affirmative Action Harms Diversity Without Improving Academic Merit." Jinsook Lee, Emma Harvey, Joyce Zhou, **NG**, Thorsten Joachims, and René Kizilcec. *AAAI/ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO'24)*

30. "Wisdom and Foolishness of Noisy Matching Markets." Kenny Peng and **NG**. *ACM Conference on Economics and Computation (EC'24)*

29. "Redesigning Service Level Agreements: Equity and Efficiency in City Government Operations." Zhi Liu and **NG**. *ACM Conference on Economics and Computation (EC'24)*

28. "Equitable Congestion Pricing under the Markovian Traffic Model: An Application to Bogota." Alfredo Torrico, Natthawut Boonsiriphatthanajaroen, **NG**, Andrea Lodi, and Hugo Mainguy. *ACM Conference on Economics and Computation (EC'24)*

27. "Addressing Discretization-Induced Bias in Demographic Prediction" Evan Dong, Aaron Schein, Yixin Wang, and **NG**. *ACM Conference on Fairness, Accountability, and Transparency (FAccT '24)*

26. "Reconciling the accuracy-diversity trade-off in recommendations" Kenny Peng, Manish Raghavan, Emma Pierson, Jon Kleinberg, and **NG**. *ACM Web Conference* (*WWW'24*) **Oral presentation.**

25. "Domain constraints improve risk prediction when outcome data is missing." Sidhika Balachandar, **NG**, and Emma Pierson. *Twelfth International Conference on Learning Representations* (*ICLR'24*)

24. "A Bayesian Spatial Model to Correct Under-Reporting in Urban Crowdsourcing." Gabriel Agostini, Emma Pierson, and **NG**. *AAAI Conference on Artificial Intelligence* (*AAAI'24*) **Oral presentation.**

23. "Identifying and Addressing Disparities in Public Libraries with Bayesian Latent Variable Modeling: Evidence from the New York Public Library" Zhi Liu, Sarah Rankin, and **NG**. *AAAI Conference on Artificial Intelligence* (*AAAI'24*)

22. "Large language models shape and are shaped by society: A survey of arXiv publication patterns" Rajiv Movva, Sidhika Balachandar, Kenny Peng, Gabriel Agostini, **NG**, and Emma Pierson. *The North American Chapter of the Association for Computational Linguistics* (*NAACL'24*)

21. "Supply-Side Equilibria in Recommender Systems." Meena Jagadeesan, **NG**, and Jacob Steinhardt. *Thirty-seventh Conference on Neural Information Processing Systems* (*NeurIPS '23*)

20. "Faster Information for Effective LTC Discharge, A Field Study in Adult Foster Care." Vince Bartle, Nicola Dell and **NG**. *ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization* (*EAAMO '23*)

19. "Interface Design to Mitigate Inflation in Recommender Systems." Rana Shahout, Yehonatan Peisakhovsky, Sasha Stoikov, and **NG**. *ACM Conference on Recommender Systems* (*RecSys '23*)

18. "Coarse race data conceals disparities in clinical risk score performance." Rajiv Movva, Divya Shanmugam, Kaihua Hou, Priya Pathak, John Guttag, **NG**, and Emma Pierson. *Machine Learning for Healthcare* (*MLHC '23*)

    ML4H Best Findings Paper (Honorable Mention), 2023

17. "Equity in Resident Crowdsourcing: Measuring Under-reporting without Ground Truth Data." Zhi Liu and **NG**. *ACM Conference on Economics and Computation* (*EC '22*).

16. "Combatting Gerrymandering with Social Choice: the Design of Multi-member Districts." **NG**, Wes Gurnee, David Rothschild, and David Shmoys. *ACM Conference on Economics and Computation* (*EC '22*) and *Under Review at Operations Research.*

    Media: *Cornell Chronicle*

15. "Trucks Don't Mean Trump: Diagnosing Human Error in Image Analysis." J.D. Zamfirescu-Pereira, Jerry Chen, Emily Wen, Allison Koenecke, **NG**, and Emma Pierson. *ACM Conference on Fairness, Accountability, and Transparency* (*FAccT '22*)

14. "Fair Ranking: a Critical Review, Challenges, and Future Directions." Gourab K Patro, Lorenzo Porcaro, Laura Mitchell, Qiuyue Zhang, Meike Zehlike, and **NG**. *ACM Conference on Fairness, Accountability, and Transparency* (*FAccT '22*)

13. "Strategic Ranking." Lydia Liu, **NG**, and Christian Borgs. *International Conference on Artificial Intelligence and Statistics* (*AISTATS '22*)

12. "Test-optional Policies: Overcoming Strategic Behavior and Informational Gaps." Zhi Liu and **NG**. *ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization* (*EAAMO '21*)

11. "The Stereotyping Problem in Collaboratively Filtered Recommender Systems." Wenshuo Guo, Karl Krauth, Michael I. Jordan, and **NG**. *ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization* (*EAAMO '21*)

10. "Standardized Tests and Affirmative Action: The Role of Bias and Variance." (2021) **NG**, Hannah Li, and Faidra Monachou. *ACM Conference on Fairness, Accountability, and Transparency* (*FAccT '21*). Also accepted to the *ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization* (*EAAMO '21*).

    ACM EAAMO Student Paper Award, 2021

    INFORMS DEI Best Student Paper Award, 2022

9. "Driver Surge Pricing" (2020). **NG** and Hamid Nazerzadeh. *ACM Conference on Economics and Computation* (*EC '20*).

8. "Designing Informative Rating Systems: Evidence from an Online Labor Market" (2020). **NG** and Ramesh Johari. *ACM Conference on Economics and Computation* (*EC '20*).

7. "Fair Allocation through Selective Information Acquisition" (2020). William Cai, Johann Gaebler, **NG**, and Sharad Goel. *AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society* (*AIES '20*).

6. "Who is in Your Top Three? Optimal Learning in Elections with Many Candidates" (2019). **NG**, Lodewijk Gelauff, Sukolsak Sakshuwong, and Ashish Goel. *AAAI Conference on Human Computation and Crowdsourcing* (*HCOMP '19*).

5. "Analyzing Polarization in Social Media: Method and Application to Tweets on 21 Mass Shootings" (2019). Dora Demszky, **NG**, Rob Voigt, James Zou, Jesse Shapiro, Matthew Gentzkow, and Dan Jurafsky. *North American Chapter of the Association for Computational Linguistics* (*NAACL '19*).

    Media: *Washington Post*, *Stanford News*

4. "Designing Optimal Binary Rating Systems" (2019). **NG** and Ramesh Johari. *International Conference on Artificial Intelligence and Statistics* (*AISTATS '19*).

3. "Markets for Public Decision-making" (2018). **NG**, Ashish Goel, and Ben Plaut. *Web and Internet Economics* (*WINE '18*).

2. "Collaborative Optimization for Collective Decision-making in Continuous Spaces" (2017). **NG**, Vijay Kamble, Ashish Goel, David Marn, and Kamesh Munagala. *International Conference on World Wide Web* (*WWW '17*).

1. "Impact of Dual Slope Path Loss on User Association in HetNets" (2015). **NG**, Sarabjot Singh, and Jeffrey Andrews. *IEEE Globecom Workshops* (*GC Wkshps '15*).

Theses

2. "Designing Marketplaces and Civic Engagement Platforms: Learning, Incentives, and Pricing" (2020). **NG**. *PhD Dissertation*, Stanford University.

    INFORMS George Dantzig Dissertation Award, 2020

    ACM SIGecom Dissertation Award (Honorable Mention), 2021

1. "Downlink and Uplink User Association in Dense Next-Generation Wireless Networks" (2015). **NG**. *Bachelors Thesis*, University of Texas at Austin, Austin, TX.

INVITED TALKS & SELECTED PRESENTATIONS

Recommendations in High-stakes Settings/Noise in matching markets
— Toronto Rotman, INFORMS JGIF Seminar, Netflix, Penn State, CMU   2024
— Columbia Workshop on Fairness in Operations and AI   2023

Tutorial on AI for Social Interest (*Co-presenter*)
— EAAMO   2023

Efficiency and Equity in Resident Crowdsourcing
— Institute for Pure and Applied Mathematics, MIT, ACM EC, Columbia GSAPP   2024
— MIT, Michigan, UT Austin, Cornell SCAN, NYC Open Data, Data Driven Urban Tech, Impact Labs   2023
— UIUC C3.ai, Harvard CRCS, INFORMS, Columbia DRO/IEOR, NYU   Fall 2022

— Google, INFORMS AI/OR workshop	Summer 2022
— U. Pittsburgh, IIM Ahmedabad, C3.ai, U. Maryland Social Impact Analytics Workshop	Spring 2022
NYC Open Data Week, Columbia DSI, NBER Decentralization Conference, TOC4Fairness	

Combatting Gerrymandering with Social Choice: the Design of Multi-member Districts
— Public Choice Society, JMM - Institute for Mathematics and Democracy	2022 & 2023
— Duke, ETH Zurich, USC, INFORMS	2021

Dropping Standardized Testing for Admissions: Differential Variance and Access
— NYU, Yale, Sharif	2021

Political Data Science and Operations for the 2020 Elections
— Springboard Rise, Cornell Tech	Fall 2020

Driver Surge Pricing
— EC	July 2020
— Berkeley Haas, NYU Stern, UCLA Anderson, USC Marshall, Cornell Tech, Cornell ORIE	Spring 2020
— UT Austin McCombs, Minnesota ISyE, MIT Sloan, Georgetown McDonough, Virginia Darden	Fall 2019
Cornell ORIE Young Researchers Workshop, INFORMS Annual Meeting	
— Market Design workshop at EC, Revenue Management and Pricing Conference	June 2019

Designing Informative Rating Systems: Evidence from an Online Labor Market
— EC	July 2020
— INFORMS Annual Meeting 2019	October 2019
— Uber research seminar	July 2018
— Market Design workshop at EC	June 2018
— Stanford SOAL seminar	April 2018
— INFORMS Annual Meeting 2017	October 2017
— Marketplace Innovation Workshop	June 2017

Word Embeddings Quantify 100 Years of Gender and Ethnic Stereotypes
— USF Data Institute	June 2019
— Stanford Symbolic Systems Symposium	January 2019

Who is in Your Top Three? Optimal Learning in Elections with Many Candidates
— AAAI Conference on Human Computation and Crowdsourcing	October 2019

Markets for Public Decision-making
— INFORMS Annual Meeting 2018	November 2018

Collaborative Optimization for Collective Decision-making in Continuous Spaces
— International Conference on World Wide Web	April 2017

INDUSTRY & POLICY EXPERIENCE

PredictWise
Principal Data Scientist	2020
Senior Scientific Advisor	2020-Present
Elections analytics for registration, turnout, and persuasion	

Uber	Summer 2018
Data Science Intern, Marketplace	
Algorithmic pricing and driver payments	

IEEE-USA	Summer 2015
Technology Policy Associate	
Wireless spectrum regulation	

Microsoft	Summer 2014
Software Development Engineering Intern, Bing Ads	

Streaming data pipeline for ad analytics

Texas Senate Fall 2013
Legislative Intern, State Senator Davis's Legislative Office
Bill research and constituent communications

NASA Summer 2013
Research Associate, Glenn Research Center
Multi-modal signal processing to measure attentive cognitive state

Collaboration/consulting: PredictWise, Clipboard Health, Ocurate, Upwork, Jet Blue Technology Ventures, SNCF, DAS Worldwide

TEACHING

Cornell Tech (All as primary faculty and/or course designer)
— ORIE 5355/INFO 5370 (Master's). Applied Data Science: Decision-making beyond Prediction Fall 2021-24
— ORIE 5138/CS 5854 (Master's). Networks and Markets Spring 2024
— ORIE 6217/CS 6384 (PhD). Applied Bayesian Data Analysis for Research Spring 2023
— Break Through Tech AI program (Faculty lead), undergraduates Summer 2022
— ORIE 6170 (PhD). Engineering Societal Systems Spring 2022

Stanford University
— MS&E 226. Fundamentals of Data Science, *Teaching Assistant* Fall 2018, 2019
— MS&E Exec Ed. Data Science: An Introduction to Prediction, *Course Design Assistant* 2018-2019
— OIT 521. Data Science for Online Marketplaces, *Teaching Assistant* Spring 2018

AddisCoder
— Introduction to Computer Science, *Teaching Assistant* Summer 2019

University of Texas at Austin
— EE 306. Introduction to Computing, *Teaching Assistant* Fall 2013
— M408C. Integral Calculus, *Teaching Assistant* Spring 2012

PROFESSIONAL & ACADEMIC ACTIVITIES

Reviewing and Organization

Organizer Data-Driven Urban Tech Workshop, 2023; Open Data Week 2023 event on Academia and Government Collaboration; EC21 Operations of People-Centric Systems Workshop; Open Data Week 2022 session; Tutorial for AI for Societal Interest at EAAMO23

Area Chair/Senior PC AAAI25, EAAMO24, FAccT24, EAAMO22, EAAMO21

PC Member/Reviewer EC24, ACL24, AAAI23, WWW23, EC23, FAccT23, WSDM23, EAAMO23, AASG23, FAccT22, FAccTRec22, EC22, WWW21, WINE21, EC21, MD4SG20 Workshop, NeurIPS20 CDMDE Workshop, Global Challenges in EC20, WWW18 Big Web Track, European Symposium on Algorithms, AAAI Human Computing, ICWSM

Reviewer (journals) Nature Machine Intelligence, Nature Human Behavior, PNAS, Management Science, Operations Research, M&SOM, POMS, Political Science Research and Methods, Autonomous Agents and Multi-Agent Systems, INFORMS Journal on Optimization, Information Systems, Behavior Research Methods, M&SOM and DEI student paper competitions, PNAS Nexus.
- Recipient of 2021 Management Science Service Award for reviewing

Service and Outreach

- Academic Integrity Committee, Cornell Tech, 2023-2025
- PhD Life Committee, Cornell Tech, 2022-2023
- Break Through Tech AI program faculty lead, Cornell Tech, 2022
- DEI Strategic Planning Committee, Cornell Tech, 2021-2022
- Co-lead for working groups, Mechanism Design for Social Good (MD4SG), 2020-2023
- SWAG to College (Houston non-profit) Computer Science Career Guide, 2018
- Organizer, Stanford Society & Algorithms (SOAL) Seminar, 2017-2018
- Organizer, Stanford Research on Algorithms, Incentives, and Networks (RAIN) Seminar, 2016-2017

Other Academic Positions

- Wireless Networks and Communications Group (under Jeffrey Andrews), UT Austin, 2014-2015
- Mobile and Pervasive Computing Group (under Christine Julien), UT Austin, 2012-2013
- Autonomous Vehicles Lab Freshman Research Initiative, UT Austin, 2012