

Shreyas Sekar

Postdoctoral Fellow

Laboratory for Innovation Science at Harvard
Harvard Business School

+1-518-487-8007

ssekar@hbs.edu

shreyas.sekar@gmail.com

sekarshre.github.io

Research

Objective To develop prescriptive, data-centric methods for decision making in dynamic and strategic environments with applications to e-commerce, transportation, and crowdsourcing.

Core Interests Data-Driven Operations, Machine Learning, Revenue Management & Pricing, Game Theory, Economics of Information, Mechanism Design, Computational Social Choice, Business Analytics.

Academic Employment

2018–Present **Postdoctoral Fellow**, *Harvard Business School*, Boston, MA.

Mentors: Prof. Kris Ferreira, Prof. Karim Lakhani, Prof. David Parkes

2017–2018 **Visiting Fellow**, *Laboratory for Innovation Science, Harvard Business School*.

2017–2018 **Visiting Researcher**, *University of Washington*, Seattle, WA.

Mentors: Prof. Baosen Zhang and Prof. Lillian Ratliff, Dept. of Electrical & Computer Engineering

Education

2012–2017 **Ph.D in Computer Science**, *Rensselaer Polytechnic Institute*, Troy, NY.

Thesis: Algorithms for Non-Discriminatory Pricing and Decentralized Resource Allocation

Recipient of the **Robert McNaughton Prize for the best graduate dissertation in CS**.

Advisor: Elliot Anshelevich

2008–2012 **Bachelor of Technology**, *Indian Institute of Technology*, Roorkee, India.

Major: Electronics and Communication Engineering

Industry and Academic Experience

2017–Present **Academic Consultant**, *WAYFAIR INC.*, Boston, MA.

Developed online learning algorithms for product ranking that balance popularity and diversity. Algorithms are currently being tested on Wayfair's event pages.

2018–Present **Teaching Fellow**, *HARVARD BUSINESS ANALYTICS PROGRAM*, Cambridge, MA.

Currently serving as a teaching fellow for the Data-Driven Marketing Course. Duties include developing and delivering lectures and data science exercises, and managing online teaching strategies.

2018–Present **Member**, *MECHANISM DESIGN FOR SOCIAL GOOD* (Research Group).

Member of the Working Group on Online Labor Markets. Mechanism Design for Social Good is a multi-institutional initiative aimed at facilitating interactions and fostering collaborations to enable the use of algorithms for socially relevant problems.

Spring 2016 **Summer Research Intern**, *MICROSOFT RESEARCH*, Cambridge, UK.

Mentors: Peter Key, Ian Kash, and Milan Vojnovic

Analyzed cloud data to construct new models for multi-dimensional resource consumption. Developed algorithms for online recommendations that bridge the gap between simplicity and optimality.

Fall 2012 **Graduate Teaching Assistant**, *RENSSELAER POLYTECHNIC INSTITUTE*, Troy, NY.

Instructor: Mukkai S. Krishnamoorthy

Served as a teaching assistant for CSCI 2300 Introduction to Algorithms and organized lab sessions for over 50 students

Journal Papers

(papers marked by * are ordered by contribution, default is alphabetical order)

- 2019 Kris Ferreira, Sunanda Parthasarathy and Shreyas Sekar, "Learning to Rank an Assortment of Products". **Major Revision, Management Science: Special Issue on Data-Driven Prescriptive Analytics** [ssrn ID: 3395992].
- Among 16/80 papers selected for Spotlight presentation at Revenue Management & Pricing Conf.
- 2019 Shreyas Sekar, Milan Vojnovic and Se-Young Yun, "A Test Score Based Approach to Stochastic Submodular Optimization". *Forthcoming, Management Science*. [arXiv: 1605.07172]
- 2019 Pan Li, Shreyas Sekar and Baosen Zhang, "A Capacity-Price Game for Uncertain Renewable Resources". *Forthcoming, IEEE Transactions on Sustainable Computing* [invited paper].
- 2019 Shreyas Sekar, Liyuan Zheng, Lillian J. Ratliff, Baosen Zhang*, "Uncertainty in Multi-Commodity Routing Networks: When does it help?". *Forthcoming, IEEE Transactions on Automatic Control*.
- 2018 Lillian J. Ratliff, Roy Dong, Shreyas Sekar, Tanner Fiez. (2019). "A perspective on incentive design: Challenges and opportunities". *Annual Review of Control, Robotics, and Autonomous Systems*. 2:305-338. [invited survey article] .
- 2017 Elliot Anshelevich, Koushik Kar, Shreyas Sekar. (2017). "Envy-free pricing in large markets: Approximating revenue and welfare". *ACM Transactions on Economics and Computation (TEAC)*. 5(3):16.

Working Papers

- 2019 Hongyao Ma, Hamid Nazerzadeh, David Parkes and Shreyas Sekar, "Optimal Subscription Schemes for Ride-Hailing Platforms". *In preparation*.
Presentation at INFORMS 2019 Annual Meeting.
- 2019 Kobi Gal, David Parkes and Shreyas Sekar, "Social Welfare vs. Social Mobility: A Study of Leaderboard Behavior in Contests". *In preparation*.
- 2019 Negin Golrezaei, Vahideh Manshadi, Jon Schneider and Shreyas Sekar, "Learning Product Rankings under Fake Clicks and Adversarial Manipulations". *In preparation*.

Peer-Reviewed Conference Publications

(papers marked by * are ordered by contribution, default is alphabetical order)

- 2018 Tanner Fiez, Shreyas Sekar, Liyuan Zheng and Lillian Ratliff*, "Combinatorial Bandits for Incentivizing Agents with Dynamic Preferences". *Proceedings of the Conference on Uncertainty in Artificial Intelligence (UAI 2018)*.
- 2018 Pan Li, Shreyas Sekar and Baosen Zhang, "A Capacity-Price Game for Uncertain Renewable Resources". *Proceedings of the International Conference on Future Energy Systems (ACM e-Energy 2018)* [Finalist for the Best Paper Award].
Preliminary version presented at the Mechanism Design for Social Good workshop at EC 2018
- 2018 Charalampos E. Tsourakakis, Shreyas Sekar, Johnson Lam and Liu Yang*, "Risk-Averse Matchings over Uncertain Graph Databases". *Proceedings of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD 2018)*.
- 2017 Shreyas Sekar, "Posted Pricing sans Discrimination". *Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI 2017)*.
- 2017 Elliot Anshelevich and Shreyas Sekar, "Price Doubling and Item Halving: Robust Revenue Guarantees for Item Pricing". *Proceedings of the ACM Conference on Economics and Computation (ACM EC 2017)*.

- 2017 Shreyas Sekar, Sujoy Sikdar and Lirong Xia, "Condorcet Consistent Bundling with Social Choice". *Proceedings of the Conference on Autonomous Agents and Multiagent Systems (AAMAS 2017)*.
- 2016 Elliot Anshelevich and Shreyas Sekar, "Truthful Mechanisms for Matching and Clustering in an Ordinal World". *Proceedings of the Conference on Web and Internet Econ. (WINE 2016)*.
- 2016 Elliot Anshelevich, Koushik Kar and Shreyas Sekar, "Pricing to Maximize Revenue and Welfare Simultaneously in Large Markets". *Proceedings of the Conference on Web and Internet Economics (WINE 2016)*.
- 2016 Elliot Anshelevich and Shreyas Sekar, "Blind, Greedy, and Random: Algorithms for Matching and Clustering using only Ordinal Information". *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI 2016)*.
- 2015 Elliot Anshelevich, Koushik Kar and Shreyas Sekar, "Envy-Free Pricing in Large Markets: Approximating Revenue and Welfare". *Proceedings of the International Colloquium on Automata, Languages, and Programming (ICALP 2015)*.
- 2015 Elliot Anshelevich and Shreyas Sekar, "Price Competition in Networked Networks: How do monopolies impact welfare?". *Proceedings of the Conference on Web and Internet Econ. (WINE 2015)*.
- 2015 Elliot Anshelevich and Shreyas Sekar, "Computing Stable Coalitions: Approximation Algorithms for Reward Sharing". *Proceedings of the Conference on Web and Internet Econ. (WINE 2015)*.
- 2014 Elliot Anshelevich and Shreyas Sekar, "Approximate Equilibrium and Incentivizing Social Coordination". *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI 2014)*.

Select Invited Talks

- 2019 Learning to Rank an Assortment of Products, *Massive Data, Algorithms, and Systems Group Seminar, Boston University*.
- 2019 Learning to Rank an Assortment of Products, *Simons Institute Workshop on Information Design & Data Science*.
- 2019 Learning to Rank an Assortment of Products, *Spotlight Presentation, Revenue Management & Pricing Conference 2019*.
- 2019 Subscription Pricing Policies in Ride-Sharing, *Mech. Design for Social Good reading group*.
- 2018 Learning to Rank an Assortment of Products, *INFORMS Annual Meeting*.
- 2018 Optimal Information Design for Selfish Routing: Exploiting Uncertainty for Social Good, Seminar at *University of California, Berkeley*.
- 2017 Optimization using Test Scores, Seminar at *Microsoft Applied Research, Seattle*
- 2015 Algorithms for Fair Pricing: How to maximize revenue without compromising on buyer happiness, Seminar at *IBM Research, NY, USA*.

Selected Awards and Honors

- 2019 Invited to deliver talk at the Simons Institute: Workshop on Info. Design & Data Science
- 2018 Finalist for best paper award at ACM e-Energy 2018 conference
- 2017 OPA Postdoctoral Travel Award by University of Washington
- 2017 IJCAI Travel Award by NSF for attending IJCAI 2017 conference
- 2013-2015 Award for service to Computer Science Department, RPI
- 2007 Among the top 24 students in India selected to participate in the training camp for the Indian team to the International Olympiad in Informatics (IOI) 2008. Finished 9th overall.

Professional Service

[Session Chair]

- 2019 INFORMS Annual Meeting: Session on Dynamic Algorithms for Revenue Management in Online Markets

[Program Committee]

- 2020 ACM Conference on Economics and Computation (EC)
2020 International Joint Conference on Artificial Intelligence (IJCAI)
2019 International Joint Conference on Artificial Intelligence (IJCAI)
2019 International Conference on Autonomous Agents and Multiagent Systems (AAMAS)
2019 AAAI Conference on Artificial Intelligence (AAAI)
2017 Workshop on Cooperative Games in Multiagent Systems (CoopMAS)

[Referee]

- 2019 Reviewer for the Elwood S. Buffa Doctoral Dissertation Award, DSI 2019
2013-2019 Reviewer for several journals and conferences including Management Science, Mathematical Social Sciences, Journal of Artificial Intelligence Research, SODA, EC

[Co-Supervisor, Undergraduate Theses]

- 2019 Emily Jia. A holistic framework for measuring diversity across short stories

Computer skills

- Languages Python, C/C++, MATLAB, Java, R
Other \LaTeX , SQL, AMPL/CPlex, Shell Scripting, PHP, HTML

References

Kris Ferreira

Assistant Professor
Technology & Operations Management Unit
Harvard Business School
Email: kferreira@hbs.edu

Karim Lakhani

Professor
Technology & Operations Management Unit
Harvard Business School
Email: klakhani@hbs.edu

Elliot Anshelevich

Professor
Department of Computer Science
Rensselaer Polytechnic Institute
Email: eanshel@cs.rpi.edu

David Parkes

Professor
School of Engineering & Applied Sciences
Harvard University
Email: parkes@eecs.harvard.edu