

Krishnamurthy Iyer

CONTACT INFORMATION	Shepherd Labs 477 100 Union Street SE Minneapolis, MN 55455, USA	Voice: (650) 213 6692 Email: kriyer@umn.edu WWW: iyerkri.github.io
RESEARCH INTERESTS	Game theory, mechanism design, stochastic modeling, decision-making under uncertainty Application area: dynamic markets and stochastic systems	
EMPLOYMENT	University of Minnesota , Minneapolis, MN, July 2019 — Present Associate Professor Department of Industrial and Systems Engineering	
PAST EMPLOYMENT	Cornell University , Ithaca, NY, July 2013 — June 2019 Assistant Professor School of Operations Research and Information Engineering University of Pennsylvania , Philadelphia, PA, September 2012–June 2013 Postdoctoral Researcher Department of Computer and Information Science	
EDUCATION	Stanford University , Stanford, CA, September 2006–August 2012 Ph.D., Management Science and Engineering Specialization: Operations Research Thesis: <i>Dynamic Analysis of Markets</i> . Advisor: Prof. Ramesh Johari Reading committee: Prof. Benjamin Van Roy, Prof. Peter Glynn Indian Institute of Technology, Bombay , Mumbai, India, July 2001–August 2006 M. Tech + B. Tech, Mechanical Engineering Thesis: <i>Some Contributions to Sequential Decision Making Models</i> . Advisor: Prof. N. Hemachandra, IEOR, IIT Bombay	
HONORS AND AWARDS	First Place, INFORMS Junior Faculty Interest Group Paper Competition, 2017 Ralph S. Watts '72 Excellence in Teaching Award, College of Engineering, Cornell University, 2017 Dantzig-Lieberman Fellowship, Stanford University, 2011-2012 Stanford Graduate Fellowship, Office of Technology Licensing Fellow, 2006-2010 Institute Gold Medal, IIT Bombay, 2006 Institute Silver Medal, IIT Bombay, 2006 Rakesh Mathur Academic Excellence Award, IIT Bombay, 2003 Institute Academic Awards, IIT Bombay, 2002-2005.	

JOURNAL PUBLICATIONS	D. F. Ciocan, K. Iyer, “Tractable Equilibria for Sponsored Search with Endogenous Budgets,” <i>Operations Research</i> , (forthcoming).
	A. Gorokh, S. Banerjee, K. Iyer, “From Monetary to Non-Monetary Mechanism Design via Artificial Currencies,” <i>Mathematics of Operations Research</i> , (forthcoming).
	D. Lingenbrink, K. Iyer, “Optimal Signaling Mechanisms in Unobservable Queues,” <i>Operations Research</i> , 67:5, 1397-1416, September-October 2019. (First Place in 2017 INFORMS JFIG Paper Competition.)
	J. Gao, K. Iyer, H. Topaloglu, “When Fixed Price Meets Priority Auctions: Competing Firms with Different Pricing and Service Rules,” <i>Stochastic Systems</i> , 9(1), 47-80, March 2019.
	P. Yang, K. Iyer, P. Frazier, “Mean Field Equilibria for Resource Competition in Spatial Settings,” <i>Stochastic Systems</i> , 8(4), 307-334, December 2018.
	J. Gao, K. Iyer, H. Topaloglu, “Price Competition under Linear Demand and Finite Inventories: Contraction and Approximate Equilibria,” <i>Operations Research Letters</i> , 45:4, 382-387, July 2017.
PEER-REVIEWED CONFERENCE PUBLICATIONS	K. Iyer, R. Johari, M. Sundararajan, “Mean Field Equilibria of Dynamic Auctions with Learning,” <i>Management Science</i> , 60:12, 2949-2970, December 2014.
	K. Iyer, R. Johari, C.C. Moallemi, “Information Aggregation and Allocative Efficiency in Smooth Markets,” <i>Management Science</i> , 60:10, 2509-2524, October 2014.
	K. Iyer and N. Hemachandra, “Sensitivity Analysis and Optimal Ultimately Stationary Deterministic Policies in some Constrained Discounted Cost Models,” <i>Mathematical Methods of Operations Research</i> , 71(3):401-425, April 2010.
	J. Anunrojwong, K. Iyer and Vahideh Manshadi, “Information Design for Congested Social Services: Optimal Need-Based Persuasion”, Extended Abstract, <i>The Twenty-First ACM Conference on Economics and Computation (EC’20)</i> , Worldwide, 2020
	J. Anunrojwong, K. Iyer and D. Lingenbrink, “Persuading Risk-Conscious Agents: A Geometric Approach”, Extended Abstract, <i>15th Conference on Web and Internet Economics (WINE 2019)</i> , New York, NY, 2019.
	P. Yang, K. Iyer and P. Frazier, “Information Design in Spatial Resource Competition”, Extended Abstract, <i>15th Conference on Web and Internet Economics (WINE 2019)</i> , New York, NY, 2019.
	D. Lingenbrink, K. Iyer, “Signaling in Online Retail: Efficacy of Public Signals,” Extended Abstract, <i>13th Workshop on the Economics of Networks, Systems and Computation (NetEcon 2018)</i> , Irvine, CA, 2018.
	D. Lingenbrink, K. Iyer, “Optimal Signaling Mechanisms in Unobservable Queues with

Strategic Customers,” Extended Abstract, *18th ACM Conference on Economics and Computation (EC’17)*, MIT, Boston, 2017.

A. Gorokh, S. Banerjee, K. Iyer, “From Monetary to Non-Monetary Mechanism Design via Artificial Currencies,” Extended Abstract, *18th ACM Conference on Economics and Computation (EC’17)*, MIT, Boston, 2017.

A. Gorokh, S. Banerjee, K. Iyer, “Near-Efficient Allocation using Artificial Currency in Repeated Settings,” Extended Abstract, *Twelfth Conference on Web and Internet Economics (WINE 2016)*, Montreal, Canada, 2016.

P. Yang, K. Iyer, P. Frazier, “Mean Field Equilibria for Competitive Exploration in Resource Sharing Settings,” *Twenty Fifth International World Wide Web Conference (WWW 2016)*, Montreal, Canada, 2016.

K. Iyer, R. Johari, C.C. Moallemi, “Information and the Value of Execution Guarantees,” Extended Abstract, *Thirteenth ACM Conference on Electronic Commerce (EC’12)*, Valencia, Spain, 2012.

K. Iyer, R. Johari, M. Sundararajan, “Mean Field Equilibria of Dynamic Auctions with Learning,” Extended Abstract, *Twelfth ACM Conference on Electronic Commerce (EC’11)*, San Jose, CA, 2011.

K. Iyer, R. Johari, C.C. Moallemi, “Information Aggregation in Smooth Markets,” *Eleventh ACM Conference on Electronic Commerce (EC’10)*, Cambridge, MA, 2010.

PAPERS UNDER
REVIEW

Persuading Risk-Conscious Agents: A Geometric Approach
J. Anunrojwong, K. Iyer, D. Lingenbrink
Submitted, May 2020.

WORKING
PAPERS

P. Yang, K. Iyer and P. Frazier, *Information Design in Spatial Resource Competition*.

J. Anunrojwong, K. Iyer, V. Manshadi, *Information Design for Congested Social Services: Optimal Need-Based Persuasion*.

A. Gorokh, S. Banerjee, K. Iyer, *When Bribes are Harmless: The Power and Limits of Collusion-Resilient Mechanism Design*.

A. Gorokh, S. Banerjee, K. Iyer, *Scrip Economies are (Approximately) Fair and Efficient*.

D. Lingenbrink, K. Iyer, *Signaling in Online Retail: Efficacy of Public Signals*.

K. Iyer, R. Johari, C.C. Moallemi, *Welfare Analysis of Dark Pools*.

INVITED
PUBLICATIONS

K. Iyer, R. Johari, M. Sundararajan, *Mean Field Equilibria of Dynamic Auctions with Learning: A Dynamic Revenue Equivalence Theorem*, Extended Abstract (Invited), Annual Allerton Conference on Communication, Control and Computing, 2011.

K. Iyer, R. Johari, M. Sundararajan, *Mean Field Equilibria of Dynamic Auctions with Learning*, ACM SIGecom Exchanges, 10(3):10–14, December 2011.

FUNDING

National Science Foundation, “Repeated Auctions in Incomplete Information Settings with Learning Agents: Equilibrium Characterization and Optimal Auction Design,” CMMI-1633920, \$201,978, 2017-2019

National Science Foundation, “Pricing Services and Products in the Presence of Parallel Delivery Mechanisms and Strategic Consumer Behavior,” with Huseyin Topaloglu (co-PI), CMMI-1462592, \$299,586, 2015-2020.

PHD ADVISING

You Zu, ISyE, University of Minnesota, 2020–Present

Artur Gorokh, CAM, Cornell University, 2016–2020

Thesis Topic: Fairness and Efficiency in Online Allocation of Goods

Co-advised with Siddhartha Banerjee

First Position: Facebook Inc.

Pu Yang, ORIE, Cornell University, 2015–2019

Thesis Topic: Spatial Resource Competition Games

Co-advised with Peter Frazier

First Position: Facebook Inc.

David Lingenbrink, ORIE, Cornell University, 2016–2019

Thesis Topic: Information Design in Service Systems and Online Markets

First Position: Bloomberg Inc.

Jiayang Gao, ORIE, Cornell University, 2014–2017

Thesis: On Dynamic Pricing and Assortment Personalization in Strategic Settings

Co-advised with Huseyin Topaloglu

First Position: Laurion Capital Management

MENG PROJECTS
ADVISING

Walmart E-Commerce: Inbound Supply Chain Optimization, (4 MEng students, co-advised with Eric Gentsch).

Industry Partner: Walmart.com, Spring 2019 (Cornell).

Estimation of Stockout Costs using Click Data, (4 MEng Students).

Industry Partner: Walmart.com, Spring 2018 (Cornell).

Estimation of Stockout Costs using Click Data, (5 MEng Students).

Industry Partner: Walmart.com, Spring 2017 (Cornell).

US Demand Forecasting for Animal Health Products, (4 MEng students).

Industry Partner: EY/Merck. Spring 2016 (Cornell).

Simulation Analysis of Maintenance Policy for NY Citibike Bike-sharing Program, (4 MEng students, co-advised with David Shmoys).

Industry Partner: Citibike. Spring 2015 (Cornell).

UNDER-GRADUATE RESEARCH ADVISING	Stable Matching Distributions under Incomplete Preferences: A Simulation Study of Two-sided Markets Haneesha Venkata K. Kella, (ISyE), Summer 2020–Present.
	Daikin Applied: Job Life Cycle Analysis, Senior Design Project, 4 Students, ISyE, Spring 2020.
	Signaling Competition in Unobservable Queues Jerry Anunrojwang, (CS, Harvard University), Summer 2018–Fall 2018.
	Simulating Bid Distribution in Repeated Common Value Auctions Amar Shah (CS), Spring 2018
	A Queueing Model for Ex-donor Priority in Kidney Donation Saloni Gupta (ORIE), Spring 2017
DEPARTMENTAL SERVICE	Effect of Return Priority on Equilibrium Matching Rates in Queues Htoo Wai (ORIE), Spring 2016
	Simulation of FCFS infinite bipartite matching queues, Claire Yang (ORIE) and Htoo Wai (ORIE), Fall 2015.
	Graduate education committee (Fall 2019, University of Minnesota)
	MS program review committee (Fall 2019, University of Minnesota)
	Faculty search committee (Fall 2019, University of Minnesota)
PROFESSIONAL ACTIVITIES	PhD admissions committee (Spring 2017, Cornell)
	ORIE Colloquium organizing committee (Fall 2013–Spring 2016, Cornell)
	MEng admissions committee (Spring 2014, 2015, 2019, Cornell)
	Judge and team advisor in ORIE MEng case studies (Cornell)
	ORIE curriculum committee (Spring 2014–Fall 2015, Cornell)
	ORIE academic actions committee (Spring 2014–Spring 2016, Cornell)
	CURIE Academy, ORIE Field Session (July 2015, 2016, Cornell).
	Panelist, National Science Foundation, 2015.
	Judge/Reviewer:
	· INFORMS Junior Faculty Interest Group (JFIG) Paper Competition, 2020.
	· MSOM Service Management SIG Conference, 2020.
	· INFORMS Junior Faculty Interest Group (JFIG) Paper Competition, 2019.
	Discussant: 2018 MSOM Conference Service SIG
	PC Member:
	· 21st ACM Conference on Economics and Computation (EC20), Budapest, 2020.
	· The Web Conference, Taipei, 2020.
	· 14th Workshop on the Economics of Networks, Systems and Computation (NetEcon), Phoenix, AZ, 2019.
	· 20th ACM Conference on Economics and Computation (EC19), Phoenix, AZ, 2019.

- The Web Conference, San Francisco, 2019.
- 13th Workshop on the Economics of Networks, Systems and Computation (NetEcon), Irvine, 2018.
- 19th ACM Conference on Economics and Computation (EC18), Cornell University, 2018.
- The Web Conference, Lyon, 2018.
- 18th ACM Conference on Economics and Computation (EC17), MIT, 2017
- 26th International World Wide Web (WWW) Conference, Perth, 2017
- 12th Ad Auction Workshop, Maastricht, Netherlands, 2016
- 10th Workshop on the Economics of Networks, Systems and Computations (NetEcon), Portland, 2015
- 24th International World Wide Web (WWW) Conference, Florence, 2015
- 10th Conference on Web and Internet Economics, Beijing, 2014
- 23rd International World Wide Web (WWW) Conference, Seoul, 2014
- 15th ACM Conference on Economics and Computation (EC14), Stanford, 2014
- 14th ACM Conference on Electronic Commerce (EC13), Philadelphia, 2013
- 22nd International World Wide Web (WWW) Conference, Brazil, 2013

Reviewer:

- Management Science
- Operations Research
- Mathematics of Operations Research
- Games and Economic Behavior
- Marketing Science
- Transportation Science
- IEEE Transactions on Automatic Control
- IEEE Transactions on Information Theory
- Mathematical Programming
- European Journal of Operations Research
- Journal of Artificial Intelligence Research
- Journal of Autonomous Agents and Multi-Agent Systems
- IEEE Transactions and Network Science and Engineering
- IEEE Transactions on Systems, Man, and Cybernetics.

Reviewer:

- American Control Conference, 2013
- 51st IEEE Conference on Decision and Control, 2012
- ACM-SIAM Symposium on Discrete Algorithms, 2010.

Organizer:

- Session on “Markets and Equilibria,” 2020 INFORMS Annual Meeting.
- Session on “Information and Operations,” 2020 INFORMS Annual Meeting.
- Two Sessions on “Markets and Equilibria,” INFORMS Annual Meeting, Seattle, 2019
- Session on “Economic Models in OM,” INFORMS Annual Meeting, Phoenix, 2018
- Session on “Applied Probability and Economics,” INFORMS Annual Meeting, Nashville, 2016
- ORIE Colloquium, Cornell, 2013-2016, 2017
- First Annual George Dantzig Seminar, Stanford, 2009
- Operations Research Seminar, Stanford, 2007-2009.

Member:

- INFORMS, 2010-2019.
- ACM SIGecom, 2019-

SELECTED
PRESENTATIONS

Information Design for Congested Social Services: Optimal Need-Based Persuasion,

ACM Conference on Economics and Computation (EC'20), Worldwide, Jul 2020.

Persuading Risk-conscious Agents: a Geometric Approach,

Math Econ Seminar, Department of Economics, University of Minnesota, MN, Mar 2020.

INFORMS Annual Meeting, Seattle, WA, Oct 2019.

Information Design and Data Science Workshop, Simons Institute, Berkeley, Oct 2019.

From Monetary to Non-Monetary Mechanism Design via Artificial Currencies,

STCS Seminar, School of Technology and Computer Science, TIFR, Mumbai, India, Dec 2018.

Design of Markets and Service Systems with Strategic Agents,

Tutorial, 51st Annual Convention of the Operational Research Society of India, Dec 2018.

Design of Information Sharing Mechanisms in Service Systems,

Institute for Mathematics and its Applications (IMA), Minneapolis, MN, Oct 2018.

SISL Seminar, California Institute of Technology, CA, Nov 2018.

Olin Business School, Washington University in St. Louis, MO, Nov 2018.

Industrial & Systems Engineering, University of Minnesota, Feb 2019.

Signaling In Queues With Risk Averse Customers,

INFORMS Annual Meeting, Phoenix, AZ, Nov 2018.

Signaling in Online Retail: Efficacy of Public Signals,

INFORMS Revenue Management and Pricing Section Conference, Toronto, June 2018.

INFORMS Annual Meeting, Seattle, WA, Oct 2019.

Optimal Signaling Mechanisms in Unobservable Queues,

INFORMS Applied Probability Society Conference, Evanston, July 2017.

IEOR Seminar, IIT Bombay, Mumbai, India, Aug 2017.

STCS Seminar, School of Technology and Computer Science, TIFR, Mumbai, India, Aug 2017.

Systems Science Seminar, Department of EECS, University of Michigan, Sept 2017.

INFORMS Annual Meeting, Houston, TX, Oct 2017.

Ezra's Round Table/Systems Seminar, Cornell University, Feb 2018.

Operations, Information & Technology Seminar, Stanford GSB, May 2018.

Truthful Equilibrium in Sponsored Search with Endogenous Budgets,

Marketplace Innovation Workshop, Stanford University, June 2017.

Mean Field Equilibria for Competitive Exploration,

INFORMS Annual Meeting, Philadelphia, PA, Nov 2015.
Mostly OM Workshop, Tsinghua University, Beijing, China, May 2016.
INFORMS International, Hawaii, June 2016.
INFORMS Annual Meeting, Nashville, TN, Nov 2016.
CIS/OMG Seminar, Simon Business School, University of Rochester, NY, May 2017.

When Fixed Price Meets Priority Auctions: Service Systems with Dual Modes,

INFORMS Applied Probability Society Conference, Istanbul, Turkey, July 2015.
INFORMS Annual Meeting, Nashville, TN, Nov 2016.

Welfare Analysis of Dark Pools,

SIAM Conference on Financial Mathematics and Engineering, Chicago, Nov 2014.
OPLOG Seminar Series, Sauder School of Business, UBC, Vancouver, Mar 2015.
IEOR Seminar, IIT Bombay, Mumbai, India, June 2015.
INFORMS Annual Meeting, Nashville, TN, Nov 2016.

Information and the Value of Execution Guarantee,

INFORMS Annual Meeting, Phoenix, AZ, Oct 2012.
INFORMS Applied Probability Society Conference, San Jose, Costa Rica, July 2013.
INFORMS Annual Meeting, Minneapolis, MN, Oct 2013.
Decision Sciences Seminar Series, Fuqua School of Business, Duke University, Mar 2014.

Mean Field Equilibria in Dynamic Auctions,

INFORMS Annual Meeting, Phoenix, AZ, Oct 2012.

Mean Field Equilibria of Dynamic Auctions with Learning,

IEOR Seminar, IIT Bombay, Mumbai, India, Apr 2011.
INFORMS Revenue Management and Pricing Section Conference, New York, June 2011.
Yahoo! Research, Santa Clara, CA, Sept 2011.
Allerton Conference on Communication, Control, and Computing, Monticello, IL, Sept 2011.
MIT Sloan School of Management, Cambridge, MA, Jan 2012.
Columbia Business School, New York, NY, Feb 2012.
Cornell ORIE, Ithaca, NY, Feb 2012.
Microsoft Research, Cambridge, UK, Apr 2012.
University of Pennsylvania, Sept 2012.
Cornell CAM Seminar, Ithaca, NY, Sept 2013.

Computing Mean Field Equilibria of Dynamic Auctions with Learning,

INFORMS Annual Meeting, Charlotte, NC, Nov 2011.

A Revenue Equivalence Theorem for Dynamic Auctions with Learning,

INFORMS Annual Meeting, Charlotte, NC, Nov 2011.

Information Aggregation and Allocative Efficiency in Smooth Markets,

INFORMS Annual Meeting, Austin, TX, Nov 2010.

TEACHING
EXPERIENCE

IE 3521: *Statistics, Quality and Reliability*, Instructor,
Level: Junior/Senior undergraduate,
Fall 2019 (two sections), University of Minnesota.

ORIE 4350: *Introduction to Game Theory*, Instructor,
Level: Senior undergraduate/Masters,
Fall 2014–2017, Spring 2019, Cornell University.

ORIE 3800: *Information Systems and Analysis*, Instructor,
Level: Junior undergraduate,
Spring 2014–2016, Spring 2018, Cornell University

ORIE 6350: *Foundations of Game Theory and Mechanism Design*, Instructor,
Level: PhD
Fall 2013, Spring 2017, Fall 2018, Cornell University.