Daniel Russo

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http://djrusso.github.io/

Education

2011 - 2015 **Stanford University**, *Stanford, CA.*
PhD in Management Science and Engineering
Concentration area: Operations Research
Advisor: Benjamin Van Roy

2007 - 2011 **University of Michigan**, *Ann Arbor, MI.*
Bachelor of Science in Economics (*with highest honors*) and Mathematics (*with honors*)

Employment

Since 2017 **Columbia Business School**, *New York, NY.*
Assistant Professor – Decision Sciences, Risk and Operations Division

2016-2017 **Kellogg School of Management, Northwestern University**, *Evanston, IL.*
Assistant Professor – Department of Managerial Economics, Decision Sciences, and Operations

2015-2016 **Microsoft Research**, *Cambridge, MA.*
Postdoctoral Research Scientist

2013 **oDesk (now Upwork)**, *Redwood City, CA.*
Research Intern
Worked on automated skills testing system to evaluate hundreds of thousands of candidates in oDesk's internet labor market. Developed algorithm for adaptively serving questions to users and a method for scoring tests.

2011 **Charles River Associates**, *Boston, MA.*
Summer Analyst – Competition and Antitrust practice

Research Interests

Topics in sequential decision-making under uncertainty and statistical machine learning, including theory and applications of online optimization, sequential design of experiments, multi-armed bandits, and reinforcement learning.

Working Papers

- J. Bhandari and D. Russo, *Global Convergence Guarantees for Policy Gradient Methods.*
- A. Kim, S. Balserio, D. Russo, *On the Futility of Dynamics in Robust Mechanism Design.* Under Review
- D. Russo and B. Van Roy, *Satisficing in Time Sensitive Bandit Learning.* Major revision at Mathematics of Operations Research.
- J. Bhandari, D. Russo, and R. Singal, *A Finite Time Analysis of Temporal Difference Learning with Linear Function Approximation.*
  - Minor Revision in Operations Research.
  - Preliminary version appeared in the Conference on Learning Theory (COLT), 2018.

Publications

- D. Russo, *Worst-Case Regret Bounds for Exploration via Randomized Value Functions.* Advances in Neural Information Processing Systems (NeurIPS), 2019
- D. Russo, *Simple Bayesian Algorithms for Best Arm Identification.* Operations Research (to appear).
  - First place, INFORMS 2016 JFIG paper competition.
  - Preliminary version appeared in the Conference on Learning Theory (COLT), 2016.
- D. Russo, *A Note on the Equivalence of Upper Confidence Bounds and Gittins Indices for Patient Agents.* Operations Research (to appear).
- D. Russo and J. Zou, *Controlling Bias from Data Exploration via Information Usage.* IEEE Transactions on Information Theory, 2019.
  - Preliminary version appeared in Artificial Intelligence and Statistics (AISTATS), 2016. [Full oral presentation; top 7% of submissions]
- I. Osband, B. Van Roy, D. Russo, and Z. Wen, *Deep Exploration via Randomized Value Functions.* Journal of Machine Learning Research, 2019
- D. Russo, B. Van Roy, A. Kazerouni, I. Osband, and Z. Wen, *A Tutorial on Thompson Sampling.* Foundations and Trends in Machine Learning, Vol. 11, No. 1, pp. 1-96, 2018.
- D. Russo and B. Van Roy, *Learning to Optimize via Information-Directed Sampling.* Operations Research, Vol. 66, No. 1, pp. 230-252, 2018.
  - First place, INFORMS George Nicholson 2014 student paper competition.
  - Preliminary version appeared in Advances in Neural Information Processing Systems (NeurIPS), 2014.
- C. Qin, D. Klabjan and D. Russo, *Improving the Expected-Improvement Algorithm.*
  - Advances in Neural Information Processing Systems (NeurIPS), 2017.
  - Journal version in preparation.
- D. Russo and B. Van Roy, *An Information Theoretic Analysis of Thompson Sampling.* Journal of Machine Learning Research Vol. 17, pp. 1-30, 2016.
- D. Russo and B. Van Roy, *Learning to Optimize via Posterior Sampling.* Mathematics of Operations Research. Vol. 39, No. 4, pp. 1221-1243, 2014.
- D. Russo and B. Van Roy, *Eluder Dimension and the Sample Complexity of Optimistic Exploration.* Advances in Neural Information Processing Systems (NeurIPS), 2013. [Full oral presentation; top 1.4% of submissions]
- I. Osband, D. Russo and B. Van Roy, *(More) Efficient Reinforcement Learning Via Posterior Sampling.* Advances in Neural Information Processing Systems (NeurIPS), 2013.
- N. Arnosti and D. Russo, *Welfare-Improving Cascades and the Effect of Noisy Reviews.* Workshop on Internet & Network Economics (WINE), 2013.

Honors and Awards

- First place in INFORMS 2016 JFIG paper competition
- First place in INFORMS George Nicholson 2014 student paper competition
- Accel Fellowship 2014-2015

- Stanford Graduate Fellowship 2011-2014
- University of Michigan 2011 Ferrando Honors Prize:
  - "*Awarded annually to the best senior pursuing honors in Economics*".

Teaching Experience

2017-2019 **Columbia Business School**, *Columbia University*.
Managerial Statistics (MBA Core)
Dynamic Programming and Reinforcement Learning (PhD).

2016-2017 **Kellogg School of Management**, *Northwestern University*.
Operations Mangement (MBA Core)
Statistical Learning in Sequential Decision Making (PhD).

Invited Talks

2019 Cornell ORIE; University of Washington ADSI Workshop on Learning and Control; Mostly OM workshop; Microsoft Research New York;

2018 Columbia Economics; Two Sigma; Michigan EECS; Institute for Mathematics and its Applications; Princeton ECE;

2017 MIT LIDS; Columbia DRO; Netflix;

2016 National University of Singapore - Decision Sciences department; Google Deep Mind; Uber Data Science; Stanford RL Forum;

2015 Duke Decision Sciences; Microsoft Research New York; Chulalongkorn University; Stanford GSB; Harvard SEAS; Michigan IOE; Georgia Tech ISYE; Chicago Booth; USC Marshall; UT Austin ECE; Microsoft Research New England; Columbia IEOR; Columbia DRO; NYU Stern;

2014 Kellogg School of Management; Microsoft Research Redmond; Stanford Information Theory Forum; Allerton Conference–invited session showcasing the "Class of 2014"; NIPS Bayesian Optimization Workshop - speaker and panelist;

2013 NIPS Oral Presentation

Professional Service

- Reviewer for:
  - *Academic Journals*: Operations Research; Management Science; Journal of Machine Learning Research; Stochastic Systems; Electronic Journal of Statistics; Journal of Applied Probability; Computational Optimization and Applications;
  - *Machine Learning Conferences:* NIPS; ICML; COLT; ALT; AISTATS;

Outside Activities

Columbia Business School requires faculty members to disclose any activities that might present a real or apparent conflict of interest. I currently have no outside activities fitting this description.