Jing Dong

CONTACT INFORMATION

Columbia Business School, Kravis Hall 932
665 W 130th Street, New York, NY 10027
Email: jing.dong@gsb.columbia.edu
Last updated: Dec 2023

ACADEMIC APPOINTMENTS

Columbia Business School, New York, NY
Decision, Risk, and Operations Division

Regina Pitaro Associate Professor of Business	Jul 2020 - present
Assistant Professor	Jul 2017 - Jun 2020

Northwestern University, Evanston, IL
Department of Industrial Engineering and Management Sciences

Assistant Professor	Sep 2014 - Jun 2017

EDUCATION

Columbia University, New York, NY

Ph.D., Operations Research,	2014
M.Sc., Operations Research,	2010

Hong Kong University, Hong Kong

B.Sc. with First Class Honors, Actuarial Science,	2009

RESEARCH INTERESTS

Applied probability, stochastic simulation, stochastic modeling, healthcare operations management

PUBLICATIONS

"Efficient uncertainty quantification and exploration for reinforcement learning", with Y. Zhu and H. Lam, *Operations Research, to appear*

"Managing queues with different resource requirements", with N. Zychlinski and C. Chan *Operations Research, to appear*

"Spectral gap of replica exchange Langevin diffusion on mixture distributions", with X. Tong, *Stochastic Processes and their Applications, 2022, Vol 151*

"Asymptotic optimality of the Binomial-exhaustive policy for polling systems with large switchover times", with Y. Hu and O. Perry, *Annals of Applied Probability, 2022, Vol 32, No 6*
  - Y. Hu, 2020 INFORMS APS Best Student Paper Award

"Metastability in queues", *Queueing Systems, Special Issue: 100 views on queues, 2022*

"Exact sampling for the maximum of infinite memory Gaussian processes", with J. Blanchet and L. Chen, *Advances in Modeling and Simulation, 2022, Springer*

"Use of real-time information to predict future arrivals in the Emergency Department", with Y. Hu, C. Chan, K. Cato, N. Gavin, S. Rossetti, and B. Chang *Annals of Emergency Medicine, to appear*

"Association between delayed discharge from acute care and rehabilitation outcomes and length-of-stay: a retrospective cohort study", with B. Gorgulu, K. Hunter, K. Bettio, B. Vukusic, J. Ranisau, G. Spencer, T. Tang, and V. Sarhangian *Archives of Physical Medicine and Rehabilitation, to appear*

"Optimal scheduling of proactive service with customer deterioration and improvement", with Y. Hu and C. Chan, *Management Science, 2022, Vol. 68, No. 4*

  - Y. Hu, Finalist, 2019 IBM Best Student Paper Competition

"Replica exchange for non-convex optimization", with X. Tong, *Journal of Machine Learning Research, 2021, Vol 22*

"SRPT scheduling discipline in many-server queues with impatient customers", with R. Ibrahim, *Management Science, 2021, Vol. 67, No. 12*

"Use of a novel patient-flow model to optimize hospital bed capacity for medical patients", with Y. Hu, O. Perry, R.M. Cyrus, S. Gravenor, and M.J. Schmidt, *The Joint Commission Journal on Quality and Patient Safety, 2021, Vol. 47, Issue 6*

"The impact of high-flow nasal cannula use on patient mortality and the availability of mechanical ventilators in COVID-19", with H.B. Gershengorn, Y. Hu, J.-T. Chen, S.J. Hsieh, M.N. Gong, C.W. Chan, *Annals of the American Thoracic Society, 2021, Vol. 18, Issue 4*

"ϵ-Strong simulation for fractional Brownian motion and related stochastic differential equations", with Y. Chen and H. Ni, *Mathematics of Operations Research, 2021, Vol. 46, No. 2*

"A Survey on skill-based routing with applications to service operations management", with J. Chen and P. Shi, *Queueing Systems, 2020, Vol. 96, Issue 1-2*

"Managing supply in the on-demand economy: flexible workers, full-time employees, or both?" with R. Ibrahim, *Operations Research, 2020, Vol. 68, No. 4*

"Queueing models for patient-flow dynamics in inpatient wards", with O. Perry, *Operations Research, 2020, Vol. 68, No. 1*

"The impact of delay announcements on hospital network coordination and waiting times", with E. Yom-Tov and G. Yom-Tov, *Management Science, 2019, Vol. 65, No. 5*

"Exact sampling of the infinite horizon maximum of a random walk over a non-linear boundary", with J. Blanchet and Z. Liu, *Journal of Applied Probability, 2019, Vol. 56, Issue 1*

"Perfect sampling of GI/GI/c queues", with J. Blanchet and Y. Pei, *Queueing Systems, 2018, Vol. 90, Issue 1-2*

"ϵ-Strong simulation for multidimensional stochastic differential equations via Rough Path analysis", with J. Blanchet and X. Chen, *Annals of Applied Probability, 2017, Vol. 27, No. 1*

"Queues with time-varying arrivals and inspections with applications to hospital discharge policies", with C. Chan and L. Green, *Operations Research, 2017, Vol. 65, No. 2*

"Service systems with slowdowns: potential failures and proposed solutions", with P. Feldman and G. Yom-Tov, *Operations Research, 2015, Vol. 63, No. 2*

"Perfect sampling for infinite server and loss systems", with J. Blanchet, *Advances in Applied Probability, 2015, Vol. 47, Issue 3*

WORKING PAPERS   "Shortest-job-first scheduling in many-server queues with impatient customers and noisy service-time estimates ", with R. Ibrahim

"Prediction-driven surge planning with applications in the Emergency Department", with Y. Hu and C. Chan

"Optimal routing under demand surges: the value of future arrival rates", with J. Chen and P. Shi
  - J. Chen, Finalist, 2021 IBM Best Student Paper Competition

"Telemedicine is associated with reduced socioeconomic disparities in outpatient clinic no-show", with J. Qin, C. Chan, S. Homma, and S. Ye

"A primal-dual algorithm to constrained Markov decision processes ", with Y. Chen and Z. Wang

"Structural estimation of load balancing behavior in inpatient ward network", with P. Shi, F. Zheng and X. Jin

"Existence and approximations of moments for polling systems under the Binomial-exhaustive policy", with Y. Hu and O. Perry

"Scheduling with service-time information: the power of two priority classes", with Y. Chen
  - Honorable Mention, 2020 INFORMS JFIG Paper Competition

"Off-service placement in inpatient ward network: resource pooling versus service slowdown", with P. Shi, F. Zheng and X. Jin
  - Second Place, 2020 POMS College of Healthcare Operations Management Best Paper Award

"A new approach to sequential stopping for stochastic simulation", with P. Glynn

Peer reviewed conference proceedings	"On constructing confidence region for model parameters in stochastic gradient descent via batch means", with Y. Zhu, *Proceedings of the 2021 Winter Simulation Conference*
	"Scheduling Queues with Simultaneous and Heterogeneous Requirements from Multiple Types of Servers ", with N. Zychlinski and C. Chan, *Proceedings of the 2020 Winter Simulation Conference*
	"The asymptotic validity of sequential stopping rules for confidence interval construction using standardized time series", with P. Glynn, *Proceedings of the 2019 Winter Simulation Conference*
	"On the almost sure convergence rate for a series expansion of fractional brownian motion", with Y. Chen, *Proceedings of the 2019 Winter Simulation Conference*
	"Accelerating nonconvex learning via replica exchange Langevin diffusion", with Y. Chen, J. Chen, J. Peng and Z. Wang, *2019 International Conference on Learning Representations*
	"Unbiased metamodeling via likelihood ratios", with M.B. Feng and B. Nelson, *Proceedings of the 2018 Winter Simulation Conference*
	"Three asymptotic regimes for ranking and selection with general sample distributions", with Y. Zhu, *Proceedings of the 2016 Winter Simulation Conference*
	"Sampling point processes on stable unbounded regions and exact simulation of queues", with J. Blanchet, *Proceedings of the 2012 Winter Simulation Conference*
Grants	Columbia Provost's Grants Program for Junior Faculty who Contribute to the Diversity Goals of the University. Title "Improving Proactive Care and Post-Discharge Care", Jul 2020 - Jun 2022,

Role: PI

National Science Foundation CMMI-1944209. Title: "CAREER: Improving Operational Decision Making with Predictive Information and Data". Duration: Mar 2020 - Feb 2025, Role: PI

National Science Foundation CMMI-1762544. Title: "Collaborative Research: GOALI: Improving Patient Flow in Hospitals". Duration: Aug 2018 - Jul 2021. Role: PI (Lead PI: Ohad Perry, Industry Co-PI: Stephanie Gravenor at Northwestern Memorial Hospital)

National Science Foundation DMS-1720433. Title: "Collaborative Research: Tolerance-Enforced Simulation of Stochastic Processes". Duration: Sep 2017 - Aug 2020. Role: PI (Lead PI: Jose Blanchet)

INVITED TALKS IN ACADEMIC INSTITUTIONS	Kellogg School of Management, Northwestern University, 2022

Kellogg School of Management, Northwestern University, 2022
Department of Operations Research and Information Engineering, Cornell University, 2022
Business School, Imperial College London, 2022
Booth School of Business, University of Chicago, 2022
Department of Information Engineering and Operations Research, Columbia University, 2019, 2022
New York City Operations Day, Cornell Tech, 2022
Business School, Chinese University of Hong Kong, 2022
Chinese University of Hong Kong Shenzhen, 2019, 2022
Workshop on Applications of Rough Paths: Computational Signatures and Data Science, ICERM, Brown University, 2021
Data Science Lab, MIT, 2021
Department of Industrial Engineering and Operations Research, UC Berkeley, 2021
Marshall School of Business, University of Southern California, 2021
Graduate School of Business, Stanford University, 2021
Eindhoven University of Technology, 2020
Department of Mathematics, KTH Royal Institute of Technology, 2020
Mathematical Institute, University of Oxford, Oxford, UK, 2018, 2020
Business School, Hong Kong University, Hong Kong, 2020
Rutgers Business School, New Brunswick, NJ, 2020
Sloan School of Management, MIT, Cambridge, MA, 2020
Peking University, Beijing, China, 2019, 2020
McCombs School of Business, University of Texas at Austin, 2019
Sauder School of Business, University of British Columbia, 2019
Department of Industrial Engineering and Decision Analytics, Hong Kong University of Science and Technology, 2019
School of Management, University College London, 2018
Mostly OM Workshop, Tsinghua University, 2018
IBM Thomas J. Watson Research Center, 2014, 2018
Berkeley-Columbia Meeting in Engineering and Statistics, Columbia University, 2018
Department of Industrial and System Engineering, University of Minnesota, 2017
School of Industrial and System Engineering, Georgia Tech, 2017
Graduate School of Business, Columbia University, 2017
Fuqua School of Business, Duke University, 2016
Department of Industrial and Systems Engineering, North Carolina State University, 2016
Retrospective Monte Carlo Workshop, Center for Research in Statistical Methodology, Warwick University, 2016
Department of Mathematics, University of Virginia, 2016
Applied Mathematics Colloquium, Illinois Institute of Technology, 2015
Department of Industrial Engineering and Management Sciences, Northwestern University, 2014
Department of Industrial Engineering, University of Pittsburgh, 2014
Department of Industrial and Operations Engineering, University of Michigan, 2014

National University of Singapore, 2014
Singapore University of Technology and Design, 2014

TEACHING EXPERIENCE	**Columbia University**, New York, NY, USA	
	Instructor, Graduate School of Business	Sep 2017 - present

- B6100 Managerial Statistics (MBA Core)
- B9323 Introduction to Econometrics and Statistical Inference (PhD Elective)
- B9137 DRO Topic Seminar (PhD Elective)

Northwestern University, Evanston, IL, USA

Searle Fellow   2015

Instructor, Industrial Engineering and Management Sciences   Sep 2014 - Jun 2017

- IEMS 435 Introduction to Stochastic Simulation (Ph.D. Core)
- IEMS 303 Statistics (Undergraduate)
- IEMS 315 Stochastic Models and Simulation (Undergraduate)

PH.D. STUDENT   Yi Zhu (2020, Northwestern)

- Thesis: Asymptotic uncertainty quantification for models and its application in efficient learning
- First position: WeRide

Yi Chen (2021, Northwestern, co-advised with Zhaoran Wang)

- Thesis: Algorithms for data-driven decision making
- First position: Assistant Professor at Hong Kong University of Science and Technology

Yan Chen (2022, Columbia, main advisor: Ward Whitt)

- Thesis: Extremal queueing theory
- First position: Balyasny Asset Management

Yue Hu (2022, Columbia, co-advised with Carri Chan and Ohad Perry)

- Thesis: Utilizing predictive analytics in the operational design and control of healthcare systems
- First position: Assistant Professor at Stanford University

Jinsheng Chen (2022, Columbia)

- Thesis: Essays on skills-based routing
- First position: Singapore Institute of Manufacturing Technology

Jimmy Qin (Columbia, co-advised with Carri Chan and Paul Glasserman)

Ethan Che (Columbia, co-advised with Hongseok Namkoong)

POST-DOCTORAL FELLOW   Noa Zychlinski (2018-2020), (Columbia, co-advised with Carri Chan).

- First position: Assistant Professor at Technion

PH.D. THESIS COMMITTEE   Jingtong Zhao (2021, Columbia), Yeqing Zhou (2021, Columbia), Julien Grand-Clement (2021, Columbia), Zhi Wang (2021, Columbia), Fengpei Li (2021, Columbia), Huajie Qian (2020, Columbia), Zhipeng Liu (2018, Columbia), Fei He (2018, Columbia), Yanan Pei (2018, Columbia), Yutian Nie (2017, Northwestern), Likuan Qin (2017, Northwestern), Aya Wallwater (2015, Columbia)

RELATED WORKING EXPERIENCE   **Massachusetts General Hospital**, Boston, MA   2022 - present

Research Consultant, Healthcare Systems Engineering

Alan Turing Institute, London, UK
Researcher, Analysing noisy data streams   2018 - 2020

Northwestern Memorial Hospital, Chicago, IL
Research Consultant, Capacity Planning,   Jun 2017 - Aug 2017

Northwestern University, Evanston, IL
Co-producer, Engineering Transdisciplinary Outreach Project in the Arts (ETOPiA),   2016 - 2017

Stanford University, Stanford, CA
Visiting researcher, Management Science and Engineering,   Oct 2014 - Dec 2014

Technion, Haifa, Israel
Visiting researcher, Industrial Engineering and Management,   May 2013 - Jun 2013

Institute for Computational and Experimental Research in Mathematics, Providence, RI, USA
Visiting researcher, Computational Challenges in Probability,   Sep 2012 - Dec 2012

Bank of China, Beijing, China
Research intern, Strategic Development,   Jul 2008 - Aug 2008

PROFESSIONAL ACTIVITIES	Associate Editor for:	
	Mathematics of Operations Research,	2020 - present
	Manufacturing and Service Operations Management,	2021 - present
	Operations Research Letters,	2021 - present
	Operations Research,	2022 - present
	Management Science,	2022 - present

Reviewer for:
Operations Research, Management Science, Manufacturing and Service Operations Management, Mathematics of Operations Research, Queueing Systems, Stochastic Systems, INFORMS Journal on Computing, Journal of Applied Probability, Bernoulli, IEEE Transactions on Automatic Control, IEEE Transactions on Automation Science and Engineering, Journal of American Statistical Association, ACM Transactions on Modeling and Computer Simulation, Naval Research Logistics, IISE Transactions, Operations Research for Health Care, Research in Mathematical Sciences

Peer Review for:
National Science Foundation (NSF)
Natural Sciences and Engineering Research Council of Canada (NSERC)
Research Grants Council of Hong Kong
Israel Science Foundation (ISF)

Organizing Committee of 2017 INFORMS Applied Probability Society Conference
Track co-Chair of 2019 INFORMS Annual Meeting Applied Probability Track
Track co-Chair of 2020 INFORMS Annual Meeting MSOM Service Management SIG Track
Track co-Chair of 2021 INFORMS Healthcare Conference Applied Probability Track
Organizing Committee of 2021 Columbia Applied Probability Days
Cluster co-Chair of 2022 CORS/INFORMS International Queueing Theory SIG
Co-Chair of 2022 MSOM Service Management SIG Conference
Co-Chair of 2022 INFORMS George Nicholson Student Paper Competition
Organizing Committee of IMSI long program on Mathematics, Statistics, and Innovation in Medical

and Health Care
Organizing Committee of Banff International Research Station workshop on New interfaces of
Stochastic Analysis and Rough Paths

Council Member of INFORMS Applied Probability Society,   2018 - 2020

Paper competition committee member for:
INFORMS Applied Probability Society Best Student Paper Competition,   2018, 2019
INFORMS George Nicholson Student Paper Competition,   2021
INFORMS Service Science Best Cluster Paper Award,   2021

Program committee member for:
Winter Simulation Conference,   2018 - 2022
IFIP Performance,   2021

Outside activities *Columbia Business School requires its faculty members to disclose any activities that might present a real or apparent conflict of interest. Here is the list of my outside activities.*

Research Collaborations:

- **Northwestern Memorial Hospital**, Chicago, IL   Jun 2017 - Jun 2022
  Analysis of patient flow data and developing models and tools for capacity planning of different inpatient units.

- **New York Presbyterian Hospital**, New York, NY   Jan 2019 - present
  Analysis of patient flow and nurse staffing
  Telehealth scheduling

- **Credit Valley Hospital**, Mississauga, ON   Oct 2020 - present
  Analysis of patient flow from acute to rehabilitation care

- **Hackensack University Medical Center**, Hackensack, NJ   Apr 2021 - present
  Analysis of prediction-driven staffing policy

- **Massachusetts General Hospital**, Boston, MA   Jun 2022 - present
  Analysis of surge planning