

Columbia Business School
Kravis 933, 625 W 130th Street
New York, NY 10027

Email: namkoong@gsb.columbia.edu
Homepage: <http://hsnamkoong.github.io>
Google Scholar: <https://bit.ly/3hmDmjY>

Employment

Assistant Professor, Decision, Risk, and Operations Division, Columbia Business School, 2020—Present
LinkedIn Scholar, Trust & Responsible AI, LinkedIn, 2022—Present
Research Scientist, Core Data Science, Facebook, 2019–2020
Research Assistant, Peter W. Glynn and John C. Duchi, Stanford University, 2014–2019

Education

Ph.D. Management Science and Engineering, Stanford University, 2019
Advisors: John C. Duchi and Peter W. Glynn
M.S. Statistics, Stanford University, 2017
B.S. Summa Cum Laude. Industrial Engineering and Mathematics, KAIST, 2013

Teaching

B8103: Business Analytics II (MBA, MS), Columbia University, 2021–2024
B9145: Reliable Statistical Learning (PhD), Columbia University, 2020, 2023

Publications

Working papers

- P1 E. Che, J. Dong, and H. Namkoong. Differentiable discrete event simulation for queuing network control. *arXiv:2409.03740 [cs.LG]*, 2024.
- P2 T. Zollo, A. Siah, N. Ye, A. Li, and H. Namkoong. Personallm: Tailoring llms to individual preferences. *arXiv:2409.20296 [cs.LG]*, 2024.
- P3 E. Che, D. Jiang, H. Namkoong, and J. Wang. Optimization-driven adaptive experimentation. *arXiv:2408.04570 [cs.LG]*, 2024. Selected for oral presentations at the Econometric Society Interdisciplinary Frontiers: Economics and AI+ML conference and Conference on Digital Experimentation.
- P4 J. Wang, E. Che, D. Jiang, and H. Namkoong. AExGym: Benchmarks and environments for adaptive experimentation. *arXiv:2408.04531 [cs.LG]*, 2024.
- P5 N. Ye, H. Yang, A. Siah, and H. Namkoong. Pre-training and in-context learning is Bayesian inference a la De Finetti. *arXiv:2408.03307 [stat.ML]*, 2024.
- P6 T. Cai*, Y. Fonseca*, K. Hou, and H. Namkoong. Constrained learning for causal inference and semiparametric statistics. *arXiv:2405.09493 [stat.ML]*, 2024.

- P7 K. Zhang*, T. Cai*, H. Namkoong, and D. Russo. Posterior sampling via autoregressive generation. *arXiv:2405.19466 [cs.LG]*, 2024. Selected for presentation at the Econometric Society Interdisciplinary Frontiers: Economics and AI+ML conference.
- P8 J. Lee, H. Namkoong, and Y. Zeng. Design and scheduling of an AI-based queueing system. *arXiv:2406.06855 [math.OC]*, 2024.
- P9 J. Liu*, T. Wang*, P. Cui, and H. Namkoong. On the need for a language describing distribution shifts: Illustrations on tabular datasets. *arXiv:2307.05284 [cs.LG]*, 2024.
- P10 E. Che and H. Namkoong. Adaptive experimentation at scale: A computational framework for flexible batches. *arXiv:2303.11582 [cs.LG]*, 2023. Major revision in Operations Research.
- P11 A. Boyarsky, H. Namkoong, and J. Pouget-Abadie. Modeling interference via experiment rollout. *arXiv:2305.10728 [stat.ME]*, 2023. Conference version appeared in ACM conference on Economics and Computation.
- P12 T. Cai, H. Namkoong, and S. Yadlowsky. Diagnosing model performance under distribution shift. *arXiv:2303.02011 [stat.ML]*, 2023. Major revision in Operations Research; Conference version appeared Symposium on Foundations of Responsible Computing 2023
- P13 H. Namkoong*, Y. Ma*, and P. W. Glynn. Minimax optimal estimation of stability under distribution shift. *arXiv:2212.06338 [stat.ML]*, 2022. Major revision in Operations Research.
- P14 M. Li, H. Namkoong, and S. Xia. Evaluating model performance under worst-case subpopulations. *Working paper*, 2022. Short version appeared in NeurIPS 2021.
- P15 H. Namkoong, S. Daulton, and E. Bakshy. Distilled thompson sampling: Practical and efficient thompson sampling via imitation learning. *Major revision in Manufacturing & Service Operations Management*, 2024. Selected for an oral presentation at the Neurips 2020 OfflineRL Workshop.
- P16 S. Jeong and H. Namkoong. Robust causal inference under covariate shift via worst-case subpopulation treatment effect. *arXiv:2007.02411 [stat.ML]*, 2022. Short version appeared in Conference on Learning Theory 2020.

Journal publications

- J1 S. Yadlowsky, H. Namkoong, S. Basu, J. Duchi, and L. Tian. Bounds on the conditional and average treatment effect with unobserved confounding factors. *Annals of Statistics*, 50(5):2587–2615, 2022.
- J2 J. C. Duchi, T. Hashimoto, and H. Namkoong. Distributionally robust losses against mixture covariate shifts. *Operations Research*, 2022.
- J3 J. C. Duchi and H. Namkoong. Learning models with uniform performance via distributionally robust optimization. *Annals of Statistics*, 49(3):1378–1406, 2021.
- J4 J. C. Duchi, P. W. Glynn, and H. Namkoong. Statistics of robust optimization: A generalized empirical likelihood approach. *Mathematics of Operations Research*, 46(3):946–969, 2021.
- J5 J. C. Duchi and H. Namkoong. Variance-based regularization with convex objectives. *Journal of Machine Learning Research*, 2019.

Refereed conference proceedings¹

- C1 J. Liu*, T. Wang*, P. Cui, and H. Namkoong. On the need for a language describing distribution shifts: Illustrations on tabular datasets. In *Advances in Neural Information Processing Systems 36*, 2023.
- C2 A. Boyarsky, H. Namkoong, and J. Pouget-Abadie. Modeling interference via experiment rollout. In *Proceedings of the 24th ACM conference on Economics and Computation*, 2023.
- C3 T. Cai, H. Namkoong, and S. Yadlowsky. Diagnosing model performance under distribution shift. In *Symposium on Foundations of Responsible Computing*, 2023.
- C4 M. Wortsman, G. Ilharco, S. Y. Gadre, R. Roelofs, R. Gontijo-Lopes, A. S. Morcos, H. Namkoong, A. Farhadi, Y. Carmon, S. Kornblith, and L. Schmidt. Model soups: averaging weights of multiple fine-tuned models improves accuracy without increasing inference time. In *Proceedings of the 39th International Conference on Machine Learning*, 2022
- C5 M. Wortsman, G. Ilharco, J. W. Kim, M. Li, S. Kornblith, R. Roelofs, R. Gontijo-Lopes, H. Hajishirzi, A. Farhadi, H. Namkoong, and L. Schmidt. Robust fine-tuning of zero-shot models. In *Proceedings of the 32nd IEEE Conference on Computer Vision and Pattern Recognition*, 2022. Selected for a full oral presentation
- C6 M. Li, H. Namkoong, and S. Xia. Evaluating model performance under worst-case subpopulations. In *Advances in Neural Information Processing Systems 34*, 2021.
- C7 H. Namkoong*, R. Keramati*, S. Yadlowsky*, and E. Brunskill. Off-policy policy evaluation for sequential decisions under unobserved confounding. In *Advances in Neural Information Processing Systems 33*, 2020.
- C8 S. Jeong and H. Namkoong. Robust causal inference under covariate shift via worst-case subpopulation treatment effect. In *Conference on Learning Theory*, 2020.
- C9 M. O’Kelly*, A. Sinha*, H. Namkoong*, J. Duchi, and R. Tedrake. Scalable end-to-end autonomous vehicle testing via rare-event simulation. In *Advances in Neural Information Processing Systems 31*, 2018.
- C10 R. Volpi*, H. Namkoong*, J. Duchi, V. Murino, and S. Savarese. Generalizing to unseen domains via adversarial data augmentation. In *Advances in Neural Information Processing Systems 31*, 2018.
- C11 T. Hashimoto, M. Srivastava, H. Namkoong, and P. Liang. Fairness without demographics in repeated loss minimization. In *International Conference on Machine Learning*, 2018. Best Paper Runner-up Award.
- C12 A. Sinha*, H. Namkoong*, and J. Duchi. Certifiable distributional robustness with principled adversarial training. In *International Conference on Learning Representations*, 2018. Selected for a full oral presentation; 2% of submissions.
- C13 H. Namkoong and J. C. Duchi. Variance regularization with convex objectives. In *Advances in Neural Information Processing Systems 30*, 2017. Best Paper Award.
- C14 H. Namkoong, A. Sinha, S. Yadlowsky, and J. C. Duchi. Adaptive sampling probabilities for non-smooth optimization. In *International Conference on Machine Learning*, pages 2574–2583, 2017.
- C15 H. Namkoong and J. C. Duchi. Stochastic gradient methods for distributionally robust optimization with f -divergences. In *Advances in Neural Information Processing Systems 29*, 2016.

¹Papers displayed in gray are superseded by long versions.

Technical reports & software

- T1 G. Ilharco, M. Wortsman, N. Carlini, R. Taori, A. Dave, V. Shankar, H. Namkoong, J. Miller, H. Hajishirzi, A. Farhadi, and L. Schmidt. Openclip: Open-sourced implementation of clip, Jul 2021. URL <https://doi.org/10.5281/zenodo.5143773>
- T2 A. Sinha*, H. Namkoong*, R. Volpi, and J. Duchi. Certifying some distributional robustness with principled adversarial training. *Technical Report*, 2020.
- T3 H. Namkoong, J. C. Duchi, and P. W. Glynn. Proofs for empirical likelihood with general f-divergences. *Technical Report*, 2018.

Honors & Awards

Amazon Research Award, 2022

Best Paper Finalist for “Robust fine-tuning of zero-shot models”, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022

Best Student Paper Award for “Statistics of Robust Optimization: A Generalized Empirical Likelihood Approach”, *INFORMS Applied Probability Society*, 2018

Best Paper Runner Up Award for “Fairness Without Demographics in Repeated Loss Minimization”, *International Conference on Machine Learning (ICML)*, 2018

Best Paper Award for “Variance Based Regularization with Convex Objectives”, *Neural Information Processing Systems (NeurIPS)*, 2017

Samsung Fellowship, 2013–2018

Department Fellowship, Management Science and Engineering, Stanford, 2013–2018

KAIST President’s Award (graduated top of class in the School of Engineering), 2013

Undergraduate Research Award, First Place, Department of Industrial and Systems Engineering, 2012

Professional Service

Senior Program Committee

2021-24 Area chair, NeurIPS

2023-24 Area chair, ICML

Reviewing

Journals *Operations Research*, *Management Science*, *Journal of the American Statistical Association*, *Journal of the Royal Statistical Society: Series B*, *Mathematical Programming*, *SIAM Journal on Mathematics of Data Science*, *Journal of Machine Learning Research*, *Transactions on Pattern Analysis and Machine Intelligence*, *Automatica*.

Conferences *Neural Information Processing Systems*, *International Conference on Machine Learning*, *Conference on Learning Theory*, *Conference on Algorithmic Learning Theory*, *MSOM Special Interest Group*

Workshop Organization

- 2024 Co-organizer, ACIC Invited Session on “External Validity”
- 2023 Co-organizer, NeurIPS workshop on “Distribution shifts (DistShift)”
- 2023 Co-Organizer, three INFORMS invited sessions on experimentation
- 2023 Organizer, Digital Future Initiative workshop on “Challenges in Operationalizing Responsible AI”
- 2023 Organizer, INFORMS APS invited session “Frontiers in Sequential Learning”
- 2022 Co-organizer, NeurIPS workshop on “Distribution shifts: connecting methods and applications (DistShift)”
- 2022 Organizer, INFORMS invited session “Causality & Robustness”
- 2022 Co-organizer, INFORMS invited session “Experimentation Design”
- 2022 INFORMS HAS Pierskalla Award committee member
- 2022 Co-organizer, ICDM workshop on “Algorithms Towards Ethical and Privacy Challenges in Social Media Recommendation Systems (AESM)”
- 2021 Organizer, mentoring program for PhD students at the Neurips workshop on “Distribution shifts: connecting methods and applications (DistShift)”
- 2021 Co-organizer, NeurIPS workshop on “Distribution shifts: connecting methods and applications (DistShift)”
- 2021 Co-organizer, JSM invited session on “distributional robustness, validity, causality, and generalizability”
- 2019 Co-organizer, INFORMS invited session on “AI and machine learning”

Academic Committees

- Member, Ph.D. Admissions Committee, Columbia University, 2020–current
- Member, Faculty Hiring Committee, Columbia University, 2021-22, 2023-24
- Member, Ph.D. Program Review Committee, Columbia University, 2021

External Service

- NSF panel, 2024
- Ad hoc reviewer, Methodology, Measurement, and Statistics Program, NSF, 2024

Invited Talks

2024	TOPS Department Seminar, NYU Stern
2024	Econometric Society Interdisciplinary Frontiers: Economics and AI+ML, Cornell
2024	Deployable RL Workshop Keynote, RL Conference, Amherst, MA
2024	International Symposium on Mathematical Programming, Montreal
2024	INFORMS Optimization Society Conference, Houston, TX
2024	Workshop on Optimal Transport: Theory to Applications, Humboldt University, Germany
2023	IMS International Conference on Statistics and Data Science, Lisbon, Portugal
2023	NeurIPS Tutorial “Modeling and Exploiting Data Heterogeneity under Distribution Shifts”, New Orleans, LA
2023	Stochastic Networks and Applied Probability, and Performance Seminar
2023	Management Sciences and Information Systems, Rutgers Business School
2023	Invited Session, INFORMS Annual Meeting , Phoenix, AZ
2023	Department of Industrial Engineering and Management Science, Northwestern University
2023	Big Data and Machine Learning in Econometrics, Finance, and Statistics, University of Chicago
2023	IBM Watson, NY
2023	Joint Statistical Meetings, Toronto
2023	New England Statistics Symposium
2023	INFORMS Revenue Management & Pricing Conference, London, United Kingdom
2023	INFORMS Applied Probability Society Conference, Nancy, France
2023	Panelist, Showcase on Large Language Models, Columbia Center of AI Technology
2023	Department of Management Science and Engineering, Stanford University
2023	AI Matrix Seminar, UT San Antonio
2023	Moderator, Bernstein Center for Leadership and Ethics, Columbia Business School
2023	Operations Research Center, MIT
2022	Conference on Digital Experimentation, Cambridge
2022	INFORMS Annual Meeting, Indianapolis
2022	IFDS Workshop on Distributional Robustness in Data Science, University of Washington
2022	International Conference on Continuous Optimization (Bethlehem, PA)
2022	Department of Industrial & Systems Engineering and Computer Science, KAIST
2022	College of Business and AI, KAIST
2022	International Conference on Econometrics and Statistics, Kyoto
2022	Data Science Lab, MIT
2022	Department of Economics, Columbia University
2022	Workshop on Foundations of Stable, Generalizable and Transferable Statistical Learning, Mathematical Sciences Research Institute
2021	Department of Statistics, Columbia University
2021	LinkedIn
2021	Workshop on “distributional robustness, validity, causality, and generalizability”, Joint Statistical Meetings
2021	Empirical Inference Department, Max Planck Institute for Intelligent Systems
2021	Department of Mathematics, KAIST
2021	School of Data Science, Seoul National University
2021	Data Science Institute, Columbia University
2021	Decision Science Group, McCombs School of Business, UT Austin
2020	Samsung Advanced Institute of Technology, Seoul
2020	Google Brain, Cambridge
2020	Cancelled due to COVID-19: Conference on Information Sciences and Systems, American Causal Inference Conference, SIAM Conference on Mathematics of Data Science
2019	Uber Marketplace and Uber Eats, San Francisco

2019 OIT Division, Graduate School of Business, Stanford University
 2019 INFORMS Annual Meeting, Seattle
 2019 Stitchfix, San Francisco
 2019 Department of Computer Science, University of Wisconsin-Madison
 2019 Department of Industrial and Systems Engineering, University of Wisconsin-Madison
 2019 School of Operations Research and Industrial Engineering, Cornell Tech
 2019 Machine Learning and Statistics Group, Microsoft Research New England
 2019 Operations and Statistics Group, MIT Sloan School of Management
 2019 Department of Operations Research and Industrial Engineering, UT Austin
 2019 Machine Learning Department, Carnegie Mellon University
 2019 Heinz College, Carnegie Mellon University
 2019 Department of Industrial Engineering and Operations Research, Columbia University
 2019 Decisions, Risk and Operations Division, Columbia Business School
 2019 Department of Electrical and Computer Engineering, Purdue University
 2019 Operations Management Division, Booth School of Business, University of Chicago
 2019 Data Sciences and Operations, Marshall School of Business, University of Southern California
 2018 Department of Industrial and Operations Engineering, University of Michigan
 2018 Three invited talks, INFORMS Annual Meeting (Phoenix, AZ)
 2018 Oral Presentation, International Conference on Learning Representations (Vancouver, Canada)
 2017 Oral Presentation, Neural Information Processing Systems (Long Beach, CA)
 2016 Department of Industrial and Systems Engineering, KAIST
 2016 Young Researchers Workshop, School of ORIE, Cornell University

Research Supervision

Ph.D. Advising

Ari Boyarsky (DRO), Tiffany Cai (Statistics), Ethan Che (DRO, co-advised with Jing Dong), Yuanzhe Ma (IEOR, co-advised with Garud Iyengar and Jay Sethuraman), Daksh Mittal (DRO), Isaac Scheinfeld (DRO, co-advised with Hannah Li), Naimeng Ye (DRO), Yibo Zeng (IEOR, co-advised with Henry Lam)

Student collaborators Sam Deng, Yuri Fonseca, Nicholas Galbraith, Yian Huang, Mike Li, Jiashuo Liu, Tianyu Wang, Shawn Xia, Yunbei Xu, Tom Zollo.

Postdocs

Kelly Zhang (co-advised with Dan Russo), Yanlin Qu (co-advised with Assaf Zeevi).

Undergraduates and MS students

Jimmy Wang, Leon Li, Tony Chen, Andrew Siah, Hanming Yang, Jacklyn Tsai, Kaiwen Hou, Shunri Zheng, Chris Lee, Elise Han, Andy Zhang.

Ph.D. Thesis Committee

Samuel Deng (CS), Nicholas Galbraith (Statistics), Yuanling (Judy) Gan (DRO), Yian Huang (Statistics), Yookoon Park (CS), Sudeep Raja Putta (IEOR), Claudia Shi (CS), Shangzhou (Shawn) Xia (DRO), Yunbei Xu (DRO), Yibo Zeng (IEOR), Junzhe Zhang (CS)

Undergraduate Advising

Christopher Lee (CS), Elise Han (CS), Hanming Yang (CS), Jimmy Wang (CS), Leon Li (CS), Tony Chen (CS), Andrew Siah (CS), Jacklyn Tsai (CS), Rohan Subramani (CS), Martha Wangechi Njuguna (CS)

Outside Activities

Columbia Business School requires faculty members to disclose any activities that might present a real or apparent conflict of interest. I consult at LinkedIn, serving as a LinkedIn Scholar.