# Hongseok Namkoong

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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

Research Scientist, Facebook Core Data Science, 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

## 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

## Teaching

B8101: Business Analytics II (MBA, MS), Columbia University, 2021-2022

B9145: Reliable Statistical Learning (PhD), Columbia University, 2020

## Publications[1]

### Preprints

J1 H. Namkoong, Y. Ma, and P. W. Glynn. Minimax optimal estimators for stability under distribution shift. *Under review*, 2022.

J2 M. Li, H. Namkoong, and S. Xia. Evaluating model performance under worst-case subpopulations. *Under review*, 2022. Short version appeared in NeurIPS 2021.

J3 H. Namkoong, S. Daulton, and E. Bakshy. Distilled thompson sampling: Practical and efficient thompson sampling via imitation learning. *Under review*, 2021. Selected for an oral presentation at the Neurips 2020 OfflineRL Workshop.

J4 S. Jeong and H. Namkoong. Robust causal inference under covariate shift via worst-case subpopulation treatment effect. *Under review*, 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*, 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 proceedings[2]

C1 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

C2 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

C3 M. Li, H. Namkoong, and S. Xia. Evaluating model performance under worst-case subpopulations. In *Advances in Neural Information Processing Systems 34*, 2021.

C4 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.

[1] Customary authorship ordering is by alphabetical order. Name* denotes equal contribution.
[2] Papers displayed in gray are superseded by long versions.

C5 S. Jeong and H. Namkoong. Robust causal inference under covariate shift via worst-case subpopulation treatment effect. In *Conference on Learning Theory*, 2020.

C6 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.

C7 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.

C8 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.

C9 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.

C10 H. Namkoong and J. C. Duchi. Variance regularization with convex objectives. In *Advances in Neural Information Processing Systems 30*, 2017. Best Paper Award.

C11 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.

C12 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.

### 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.

## Invited Talks

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

## Professional Service

### Senior Program Committee

2022 Area chair, NeurIPS
2021 Area chair, NeurIPS

### Workshop Organization

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"

### 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*

## 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)

Tianyu Wang (IEOR, co-advised with Garud Iyengar)

### Ph.D. Thesis Committee

Shangzhou Xia (DRO), Yunbei Xu (DRO), Junzhe Zhang (CS)

### Undergraduate Advising

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: LinkedIn Scholar.