Sewoong Oh (last updated 5/8/2022)

CONTACT

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EDUCATION

Stanford University, Stanford, CA, USA Sep 07 – Jan 11
Ph.D. in Electrical Engineering
Advisor: Andrea Montanari
Dissertation: "Matrix Completion: Fundamental Limits and Efficient Algorithms"

Stanford University, Stanford, CA, USA Sep 05 – Jun 07
Master of Science in Electrical Engineering

Seoul National University, Seoul, Korea Mar 1998 – Mar 02
Bachelor of Science in Electrical Engineering

APPOINTMENTS

Associate Professor - University of Washington Jan 19 – present
Paul G. Allen School of Computer Science & Engineering
Staff Research Scientist - Google, Seattle, WA Mar 22 – present
Visiting Scholar - Google, Cloud AI, Mountain View, CA May 17 – Aug 17
Associate Professor - University of Illinois at Urbana-Champaign Aug 18 – Dec 18
Assistant Professor - University of Illinois at Urbana-Champaign July 12 – Aug 18
Department of Industrial and Enterprise Systems Engineering
Massachusetts Institute of Technology, Cambridge, MA, USA Jan 11 – July 12
Postdoctoral Researcher at Laboratory for Information and Decision Systems (LIDS)
Mentor: Devavrat Shah

HONORS AND AWARDS

- GOOGLE Research Award, 2022
- Member of $20M NSF AI institute, AI-EDGE (Institute for Future Edge Networks and Distributed Intelligence), 2021
- Member of $20M NSF AI institute, IFML (Institute of Foundations of Machine Learning), 2020
- GOOGLE Faculty Research Award, 2020
- ACM MOBIHOC best paper award, 2019
- ACM SIGMETRICS Rising Star Award, 2017
- GOOGLE Faculty Research Award, 2016
- NSF CAREER Award, 2016
- ACM SIGMETRICS best paper award, 2015
- Lists of Teachers Ranked as Excellent, 2012 and 2015
- Kenneth C. Sevcik Outstanding Student Paper Award, ACM SIGMETRICS, 2010
- Samsung Fellowship, 2005–2010

TEACHING

University of Washington

- CSE515 "Statistical Methods in Computer Science", 2020Wi, 2021Wi
- CSE446/546 "Machine Learning", 2021Sp
- CSE446 "Machine Learning", 2019Au, 2022Wi
- CSE416 "Introduction to Machine Learning", 2019Sp

University of Illinois

- Undergraduate course IE310/311 "Operations Research", 2014Au, 2015Au, 2017Sp, 2018Sp
- Graduate course IE512, "Network Analysis of Systems", 2013Sp, 2014Sp, 2018Au
- Graduate course IE598SO, "Inference on Graphical Models", 2012Au, 2015Sp, 2016Au
- Graduate course IE532, "Analysis of Network Data", 2016Sp, 2017Au

Conference Publications

1. Liam Collins, Aryan Mokhtari, Sewoong Oh, Sanjay Shakkottai, "MAML and ANIL Provably Learn Representations", *international Conference on Machine Learning (ICML)*, 2022
2. Melih Yilmaz, William E. Fondrie, Wout Bittremieux, Sewoong Oh, William Stafford Noble, "De novo mass spectrometry peptide sequencing with a transformer model", *international Conference on Machine Learning (ICML)*, 2022
3. Xiyang Liu, Weihao Kong, Sewoong Oh, "Differential privacy and robust statistics in high dimensions", *Conference on Learning Theory (COLT)*, 2022
4. Kiran Koshy Thekumparampil, Niao He, Sewoong Oh, "Lifted Primal-Dual Method for Bilinearly Coupled Smooth Minimax Optimization", AISTATS, 2022 **(Oral presentation)**
5. Xingyu Wang, Sewoong Oh, Chang-Han Rhee, "Eliminating Sharp Minima from SGD with Truncated Heavy-tailed Noise", *International Conference on Leraning Representations (ICLR)*, 2022
6. Charlie Hou, Kiran K. Thekumparampil, Giulia Fanti, Sewoong Oh, "Reducing the Communication Cost of Federated Learning through Multistage Optimization", *International Conference on Leraning Representations (ICLR)*, 2022
7. Xiyang Liu, Weihao Kong, Sham Kakade, Sewoong Oh, "Robust and Differentially Private Mean Estimation," *Neural Information Processing Systems (NeurIPS)*, 2021
8. Kiran Koshy Thekumparampil, Prateek Jain, Praneeth Netrapalli, Sewoong Oh, "Sample Efficient Linear Meta-Learning by Alternating Minimization", *Neural Information Processing Systems (NeurIPS)*, 2021
9. Lang Liu, Krishna Pillutla, Sean Welleck, Sewoong Oh, Yejin Choi, Zaid Harchaoui, "Divergence Frontiers for Generative Models: Sample Complexity, Quantization Level, and Frontier Integral", *Neural Information Processing Systems (NeurIPS)*, 2021
10. Jaechang Kim, Jinwoo Jeon, Kangwook Lee, Sewoong Oh, and Jungseul Ok, "Gradient Inversion with Generative Image Prior", *Neural Information Processing Systems (NeurIPS)*, 2021
11. Jonathan Hayase, Weihao Kong, Raghav Somani, Sewoong Oh, SPECTRE: Defending against backdoor attacks using robust covariance estimation, *international Conference on Machine Learning (ICML)*, 2021
12. Ashok Vardhan Makkuva, Xiyang Liu, Mohammad Vahid Jamali, Hessam Mahdavifar, Sewoong Oh, Pramod Viswanath, "KO codes: Inventing Nonlinear Encoding and Decoding for Reliable WirelessCommunication via Deep-Learning", *nternational Conference on Machine Learning (ICML)*, 2021
13. Mohammad Vahid Jamali, Xiyang Liu, Ashok Vardhan Makkuva, Hessam Mahdavifar, Sewoong Oh, Pramod Viswanath, "Reed-Muller Subcodes: Machine Learning-Aided Design of Efficient Soft Recursive Decoding", *International Symposium on Information Theory (ISIT)*, 2021

14. Kiran Koshy Thekumparampil, Prateek Jain, Praneeth Netrapalli, Sewoong Oh, "Projection Efficient Subgradient Method and Optimal Nonsmooth Frank-Wolfe Method", *Neural Information Processing Systems (NeurIPS)*, 2020, **(Spotlight presentation)**
15. Weihao Kong, Raghav Somani, Sham Kakade, Sewoong Oh, "Robust Meta-learning for Mixed Linear Regression with Small Batches", *Neural Information Processing Systems (NeurIPS)*, 2020
16. Ashok Vardhan Makkuva, Amirhossein Taghvaei, Sewoong Oh, Jason D. Lee, "Optimal transport mapping via input convex neural networks", *International Conference on Machine Learning (ICML)*, 2020
17. Weihao Kong, Raghav Somani, Zhao Song, Sham Kakade, Sewoong Oh, "Meta-learning for mixed linear regression", *International Conference on Machine Learning (ICML)*, 2020
18. Zinan Lin, Kiran Koshy Thekumparampil, Giulia Fanti, Sewoong Oh, "InfoGAN-CR and ModelCentrality: Self-supervised Model Training and Selection for Disentangling GANs", *International Conference on Machine Learning (ICML)*, 2020
19. Ashok Vardhan Makkuva, Sewoong Oh, Sreeram Kannan, Pramod Viswanath, "Learning in Gated Neural Networks", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020
20. Yihan Jiang, Hyeji Kim, Himanshu Asnani, Sreeram Kannan, Sewoong Oh, Pramod Viswanath, "Turbo Autoencoder: Deep learning based channel code for point-to-point communication channels", *Neural Information Processing Systems (NeurIPS)*, 2019
21. Kiran Koshy Thekumparampil, Prateek Jain, Praneeth Netrapalli, Sewoong Oh, "Efficient Algorithms for Smooth Minimax Optimization", *Neural Information Processing Systems (NeurIPS)*, 2019
22. Xiyang Liu, Sewoong Oh, "Minimax Rates of Estimating Approximate Differential Privacy", *Neural Information Processing Systems (NeurIPS)*, 2019
23. Weihao Gao, Yu-Han Liu, Chong Wang, and Sewoong Oh, "Rate Distortion For Model Compression:From Theory To Practice", *International Conference on Machine Learning (ICML)*, 2019
24. Ashok Vardhan Makkuva, Sewoong Oh, Sreeram Kannan, and Pramod Viswanath, "Breaking the gridlock in Mixture-of-Experts: Consistent and Efficient Algorithms", *International Conference on Machine Learning (ICML)*, 2019
25. G Fanti, J Jiao, A Makkuva, S Oh, R Rana, and P Viswanath, "Barracuda: The Power of l-polling in Proof-of-Stake Blockchains", *ACM MobiHoc*, 2019, **(Best paper award)**
26. Yihan Jiang, Hyeji Kim, Himanshu Asnani, Sreeram Kannan, Sewoong Oh, and Pramod Viswanath, "LEARN Codes: Inventing Low-latency Codes via Recurrent Neural Networks", *IEEE International Conference on Communications (ICC)*, 2019
27. Weihao Gao, Ashok Vardhan Makkuva, Sewoong Oh, and Pramod Viswanath, "Learning One-hidden-layer Neural Networks under General Input Distributions", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2019
28. Jungseul Ok, Yunhun Jang, Sewoong Oh, Jinwoo Shin, Yung Yi, "Iterative Bayesian Learning for Crowdsourced Regression", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2019
29. Giulia Fanti, Leonid Kogan, Sewoong Oh, Kathleen Ruan, Pramod Viswanath, and Gerui Wang, "Compounding of Wealth in Proof-of-Stake Cryptocurrencies", *Financial Cryptography and Data Security*, 2019
30. K. Thekumparampil, A. Khetan, Z. Lin, G. Fanti, and S. Oh, "Robustness of conditional GANs to noisy labels", *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2018, **(Spotlight presentation)**,

31. Z. Lin, A. Khetan, G. Fanti, S. Oh , "PacGAN: The power of two samples in generative adversarial networks", *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2018,
32. H. Kim, Y. Jiang, S. Kannan, S. Oh, and P. Viswanath, "Deepcode: Feedback Codes via Deep Learning", *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2018,
33. H. Kim, Y. Jiang, R. B. Rana, S. Kannan, S. Oh, and P. Viswanath, "Communication Algorithms via Deep Learning", *International Conference on Leraning Representations (ICLR)*, Vancouver, Canada, April 2018
34. W. Gao, S. Kannan, S. Oh, and P. Viswanath, "Estimating Mutual Information for Discrete-Continuous Mixtures", *Neural Information Processing Systems (NIPS)*, Long Beach, CA, 2017, **(Spotlight presentation)**,
35. W. Gao, S. Kannan, H. Kim, S. Oh, and P. Viswanath, , "Discovering Potential Influence via Information Bottleneck", *Neural Information Processing Systems (NIPS)*, Long Beach, CA, 2017,
36. M. Jang, S. Kim, C. Suh, and S. Oh, "Top-K Ranking from Pairwise Comparisons: When Spectral Ranking is Optimal", *Neural Information Processing Systems (NIPS)*, Long Beach, CA, 2017,
37. A. Khetan, S. Oh, "Matrix Norm Estimation from a Few Entries", *Neural Information Processing Systems (NIPS)*, Long Beach, CA, 2017, **(Spotlight presentation)**,
38. W. Gao, S. Oh, and P Viswanath, "Density Functional Estimators with k-Nearest Neighbor Bandwidths", *International Symposium on Information Theory (ISIT)*, 2017
39. W. Gao, S. Oh, and P. Viswanath, "Demystifying Fixed k-Nearest Neighbor Information Estimators", *International Symposium on Information Theory (ISIT)*, 2017
40. W. Gao, S. Oh, and P. Viswanath, "Breaking the Bandwidth Barrier: Geometrical Adaptive Entropy Estimation", *Neural Information Processing Systems (NIPS)*, Barcelona, Spain, 2016
41. A. Khetan and S. Oh, "Computational and Statistical Tradeoffs in Learning to Rank", *Neural Information Processing Systems (NIPS)*, Barcelona, Spain, 2016
42. A. Khetan and S. Oh, "Achieving budget-optimality with adaptive schemes in crowdsourcing", *Neural Information Processing Systems (NIPS)*, Barcelona, Spain, 2016
43. W. Gao, S. Kannan, S. Oh, P. Viswanath, "Conditional Dependence via Shannon Capacity: Axioms, Estimators and Applications", *International Conference on Machine Learning (ICML)*, New York, 2016,
44. A. Khetan, S. Oh, "Data-driven Rank Breaking for Efficient Rank Aggregation", *International Conference on Machine Learning (ICML)*, New York, 2016,
45. J. Ok, S. Oh, J. Shin, Y. Yi, "Optimality of Belief Propagation for Crowdsourced Classification", *International Conference on Machine Learning (ICML)*, New York, 2016,
46. G. Fanti, P. Kairouz, S. Oh, K. Ramchandran and P. Viswanath, "Metadata-conscious Anonymous Messaging", *International Conference on Machine Learning (ICML)*, New York, 2016,
47. G. Fanti, P. Kairouz, S. Oh, K. Ramchandran and P. Viswanath, "Rumor Source Obfuscation on Irregular Trees", *ACM SIGMETRICS*, Antibes, France, 2016
48. P. Kairouz, S. Oh, and P. Viswanath, "Secure Multi-party Differential Privacy", *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2015
49. S. Oh, K. K. Thekumparampil, and J. Xu, "Collaboratively Learning Preferences from Ordinal Data", *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2015

50. S. Krishnasamy, R. Sen, S. Oh, and S. Shakkottai, "Detecting Sponsored Recommendations", *Proceedings of the 2014 ACM SIGMETRICS* Portland, Oregon, June 2015

51. G. Fanti, P. Kairouz, S. Oh, and P. Viswanath, "Spy vs. Spy: Rumor Source Obfuscation", *Proceedings of the 2014 ACM SIGMETRICS* Portland, Oregon, June 2015, **(Best paper award)**,

52. P. Kairouz, S. Oh, and P. Viswanath, "Extremal Mechanisms for Local Differential Privacy", *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2014,

53. P. Jain and S. Oh, "Provable Tensor Factorization with Missing Data", *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2014,

54. B. Hajek, S. Oh, and J. Xu, "Minimax-optimal Inference from Partial Rankings", *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2014,

55. S. Oh and D. Shah , "Learning Mixed Multinomial Logit Model from Ordinal Data", *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2014,

56. P. Jain, S. Oh, "Learning Mixtures of Discrete Product Distributions using Spectral Decompositions", *Proceedings of the 27th annual conference on learning theory (COLT)*, Barcelona, Spain, June 2014,

57. A. Ammar, S. Oh, D. Shah, L. Voloch, "What's your choice? Learning the mixed multinomial logic model," *Proceedings of the 2014 ACM SIGMETRICS*, Austin, TX, June 2014,

58. A. Marcus, D. Karger, S. Madden, R. Miller, S. Oh, "Counting with the crowd", *Proceedings of the 39th international conference on very large data bases (VLDB)*, Riva del Garda, Trento, August 2013,

59. D. R. Karger, S. Oh, D. Shah, "Efficient Crowdsourcing for Multi-class Labeling," *Proceedings of the 2013 ACM SIGMETRICS*, CMU, Pittsburgh, PA, July 2013,

60. S. Negahban, S. Oh, and D. Shah, "Iterative Ranking from Pairwise Comparisons," *Neural Information Processing Systems (NIPS)*, Lake Tahoe, CA, December 2012, **(Spotlight Presentation)**,

61. D. R. Karger, S. Oh, D. Shah, "Iterative learning for reliable crowdsourcing systems," *Neural Information Processing Systems (NIPS)*, Granada, Spain, December 2011. **(Oral Presentation)**,

62. D. R. Karger, S. Oh, D. Shah, "Budget-optimal crowdsourcing using low-rank matrix approximations," *Proc. of the Allerton Conf. on Commun., Control and Computing*, Monticello, IL, September 2011.

63. S. Korada, A. Montanari, S. Oh, "Gossip PCA," *Proceedings of the 2011 ACM SIGMETRICS*, San Jose, CA, June 2011,

64. A. Montanari, S. Oh, "On positioning via distributed matrix completion," *Sensor Array and Multichannel Signal Processing Workshop*, Jerusalem, Israel, October 2010.

65. R. Parhizkar, A. Karbasi, S. Oh, M. Vetterli, "Ultrasound tomography calibration using structured matrix completion," *The 20th International Congress on Acoustics*, Sydney, Australia, August 2010.

66. A. Karbasi, S. Oh, "Distributed sensor network localization from local connectivity: performance analysis for the HOP-TERRAIN algorithm," *Proceedings of the 2010 ACM SIGMETRICS*, New York, NY, June 2010, **(Kenneth C. Sevcik Outstanding Student Paper Award)**,

67. S. Oh, A. Karbasi, A. Montanari, "Sensor network localization from local connectivity: performance analysis for the MDS-MAP algorithm," *Proc. of the IEEE Inform. Theory Workshop*, Cairo, Egypt, January 2010.

68. R. H. Keshavan, A. Montanari, S. Oh, "Matrix completion from noisy entries," *Neural Information Processing Systems (NIPS)*, Vancouver, Canada, December 2009,
69. M. Bayati, R. H. Keshavan, A. Montanari, S. Oh, A. Saberi, "Generating random tanner-graphs with large girth," *Proc. of the IEEE Inform. Theory Workshop*, Taormina, Italy, October 2009.
70. R. H. Keshavan, A. Montanari, S. Oh, "Low-rank matrix completion with noisy observations: a quantitative comparison," *Proc. of the Allerton Conf. on Commun., Control and Computing* (invited), Monticello, IL, September 2009.
71. R. H. Keshavan, A. Montanari, S. Oh., "Matrix completion from a few entries," *Proc. of the IEEE Int. Symposium on Inform. Theory (ISIT)*, Seoul, Korea, June 2009.
72. R. H. Keshavan, A. Montanari, S. Oh, "Learning low rank matrices from O(n) entries," *Proc. of the Allerton Conf. on Commun., Control and Computing* (invited), Monticello, IL, September 2008.
73. J. Ezri, A. Montanari, S. Oh, R. Urbanke, "Computing the threshold shift for general channels," *Proc. of the IEEE Int. Symposium on Information Theory (ISIT)*, Toronto, Canada, June 2008.
74. J. Ezri, A. Montanari, S. Oh, R. Urbanke, "The slope scaling parameter for general channels," *Proc. of the IEEE Int. Symposium on Information Theory(ISIT)*, Toronto, Canada, June 2008.

Journal Publications

1. Hyeji Kim, Sewoong Oh, Pramod Viswanath, "Physical Layer Communication via Deep Learning", *IEEE Transactions on Selected Areas in Information Theory (JSAIT)*, Vol.1, no.1, pp.5-18, 2020
2. Yihan Jiang, Hyeji Kim, Himanshu Asnani, Sreeram Kannan, Sewoong Oh, Pramod Viswanath, "LEARN Codes: Inventing Low-latency Codes via Recurrent Neural Networks", *IEEE Transactions on Selected Areas in Information Theory (JSAIT)*, Vol.1, no.1, pp.207-216, 2020
3. Zinan Lin, Ashish Khetan, Giulia Fanti, Sewoong Oh, "PacGAN: The power of two samples in generative adversarial networks", *IEEE Transactions on Selected Areas in Information Theory (JSAIT)*, Vol.1, no.1, pp.324-335, 2020
4. Hyeji Kim, Yihan Jiang, Sreeram Kannan, Sewoong Oh, Pramod Viswanath, "Deepcode: Feedback Codes via Deep Learning", *IEEE Transactions on Selected Areas in Information Theory (JSAIT)*, Vol.1, no.1, pp.194-206, 2020
5. Ashish Khetan, Sewoong Oh, "Spectrum Estimation from a Few Entries", *Journal of Machine Learning Research*, Vol.20, Issue:21, January 2019
6. S. Negahban, S. Oh, K. Thekumparampil, and J. Xu, "Learning from Comparisons and Choices", *Journal of Machine Learning Research*, Vol.19, Issue:40, pp.1-95, 2018
7. A. Khetan, and S. Oh, "Generalized Rank-breaking: Computational and Statistical Tradeoffs", *Journal of Machine Learning Research*, Vol.19, Issue:28, pp.1-42, 2018
8. J. Ok, S. Oh, J. Shin, and Y. Yi, "Optimality of Belief Propagation for Crowdsourced Classification", *IEEE Transactions on Information Theory*, Vol.64, Issue:9, pp.6127-6138, September 2018
9. W. Gao, S. Oh, and P Viswanath, "Demystifying Fixed k-Nearest Neighbor Information Estimators", *IEEE Transactions on Information Theory*, Vol.64, Issue:8, pp.5629 - 5661, September 2018
10. W. Gao, S. Oh, and P Viswanath, "Breaking the Bandwidth Barrier: Geometrical Adaptive Entropy Estimation", *IEEE Transactions on Information Theory*, Vol.64, Issue:5, pp.3313-3330, May 2018

11. H. Kim, W. Gao, S. Kannan, S. Oh, and P. Viswanath, "Discovering Potential Correlations via Hypercontractivity", *Entropy*, Vol.19, Issue:11, pp.586, October 2017
12. P. Kairouz, S. Oh, and P. Viswanath, "The Composition Theorem for Differential Privacy", *IEEE Transaction on Information Theory*, Volume 63, Issue 6, pp.4037-4049, June 2017
13. G. Fanti, P. Kairouz, S. Oh, K. Ramchandran, and P. Viswanath, "Hiding the Rumor Source", *IEEE Transactions on Information Theory*, Vol.63, Issue:10, pp.6679-6713, October 2017
14. A. Khetan, and S. Oh, "Data-driven Rank Breaking for Efficient Rank Aggregation", *Journal of Machine Learning Research*, Vol.17, no.193, pp.1-54, October 2016
15. S. Krishnasamy, R. Sen, S. Oh, and S. Shakkottai, "Detecting Sponsored Recommendations", *ACM Transactions on Modeling and Performance Evaluation of Computing Systems*, Volume 2, Issue 1, pp.6:1–6:29, November 2016
16. G. Fanti, P. Kairouz, S. Oh, K. Ramchandran, and P. Viswanath, "Metadata-conscious Anonymous Messaging", *IEEE Transactions on Signal and Information Processing over Networks*, Volume: 2, Issue: 4, pp.582 - 594, Dec 2016
17. P. Kairouz, S. Oh, and P. Viswanath, "Extremal Mechanisms for Local Differential Privacy", *Journal of Machine Learning Research (JMLR)*, Vol. 17, pp.1-51, April 2016.
18. S. Negahban, S. Oh, and D. Shah, "RankCentrality: Ranking from Pair-wise Comparisons," *Operations Research*, Vol.65, no.1, pp.266-287, October 2016
19. Q. Geng, P. Kairouz, S. Oh, and P. Viswanath, "The Staircase Mechanisms in Differential Privacy", *Selected Topics in Signal Processing*, April 2015
20. D. R. Karger, S. Oh, D. Shah, "Budget-optimal task allocation for reliable crowdsourcing systems," *Operations Research*, Vol 62 Issue 1, pp.1-24, January 2014.
21. A. Karbasi, S. Oh, "Robust localization from incomplete local information," *IEEE Trans. on Networking*, Vol 21 pp.1131-1144, August 2013.
22. R. Parhizkar, A. Karbasi, S. Oh, M. Vetterli, "Calibration using matrix completion with application to ultrasound tomography," *IEEE Trans. on Signal Processing*, Vol 61, pp.4923-4933, Oct 2013.
23. A. Marcus, D. Karger, S. Madden, R. Miller, S. Oh, "Counting with the crowd", *Journal Proceedings of the VLDB Endowment*, Volume 6, Issue 2, Pages 109-120, December 2012
24. R. H. Keshavan, A. Montanari, S. Oh, "Matrix completion from noisy entries," *Journal of Machine Learning Research*, Vol 11 pp.2057-2078, July 2010.
25. R. H. Keshavan, A. Montanari, S. Oh, "Matrix completion from a few entries," *IEEE Trans. on Information Theory*, Vol 56 no.6 pp.2980-98, June 2010.

Grants

External grants

1. NSF
   - title:"Scaling Laws of Deep Learning"
   - PI: Zaid Harchaoui
   - Sewoong Oh: co-PI
   - total funding: $1,000,000
   - duration: 12/15/2021-12/14/2024
2. Google
   - title: "Investigating two research questions that naturally arises in practical settings of federated learning and Google Lens"

- PI: Sewoong Oh
- total funding: $30,000 (gift money)
- date: 1/1/2022

3. NSF
    - title: "AI Institute for Future Edge Networks and Distributed Intelligence (AI-EDGE)"
    - Lead PI: Ness Shroff (Ohio State University)
    - Sewoong Oh: Senior Personnel
    - total funding: $20,000,000
    - duration: 10/1/2021 - 9/30/2026
    - funds allocated to University of Washington: $550,000
4. NSF
    - title: "AI Institute: Institute for Foundations of Machine Learning"
    - Lead PI: Adam. Klivans (UT Austin)
    - Sewoong Oh: Senior Personnel
    - total funding: $20,000,000
    - duration: 8/1/2020 - 8/31/2025
    - funds allocated to University of Washington: $3,500,000
5. NSF, Division of Computing and Communication Foundations
    - title: "Collaborative Research: MLWiNS: Physical Layer Communication revisited via Deep Learning"
    - PIs: Sewoong Oh and Pramod Viswanath
    - total funding: $700,000
    - duration: 8/1/2020 - 7/31/2023
    - funds allocated to University of Washington: $350,000
6. Google Faculty Research Award
    - title: "Disentangling Generative Models for Federated, Identity-Sensitive Representation Learning"
    - PIs: Sewoong Oh and Giulia Fanti
    - total funding: $80,000 (gift money)
    - date: 5/1/2020
    - funds allocated to S. Oh: $40,000
7. NSF, Division of Information & Intelligent Systems
    - title: "CIF: RI: Small: Information-theoretic measures of dependencies and novel sample-based estimators"
    - PI: Sewoong Oh
    - total funding: $450,000
    - duration: 8/15/2018 - 7/31/2021
8. ARO, Network Sciences Division
    - title: "Discovering Novel Communication Algorithms via Machine Learning"
    - PI: Sewoong Oh

- total funding: $60,000,
- duration: 7/15/2018-4/15/2019

9. Extreme Science and Engineering Discovery Environment (XSEDE) Start-up Fund
   - title: "Exploring and Generating Data with Generative Adversarial Networks"
   - PIs: Giulia Fanti (lead), Sewoong Oh
   - total funding: PSC GPU (Bridges GPU): 10,000.0 GPU Hours (worth $3,241.00),
   - duration: 4/18/2018-4/19/2019
   - funds allocated to S. Oh: 15,000.0 GPU Hours (worth $1,620.00),
10. NVIDIA GPU grant
    - title: "Counting network motifs with neural networks"
    - PI: Sewoong Oh
    - total funding: Quadro P5000,
    - date: 2/2018
11. Google Faculty Research Award
    - title: "Optimal Mechanism Design for Private Data Sharing"
    - PI: Sewoong Oh
    - total funding: $50,000 (gift money)
    - date: 4/1/2017
12. NSF, Division of Computing and Communication Foundations
    - title: "CIF: Medium: Anonymous Broadcasting over Networks: Fundamental Limits and Algorithms"
    - PIs: Pramod Viswanath (lead), Sewoong Oh (co-PI), Giulia Fanti (co-PI)
    - total funding: $876,840
    - duration: 9/1/2017-8/31/2020
    - funds allocated to S. Oh: $292,280
13. NSF, Division of Computing and Communication Foundations
    - title: "CAREER: Social Computation: Fundamental Limits and Efficient Algorithms"
    - PI: Sewoong Oh
    - total funding: $457,685
    - duration: 2/15/2016-2/14/2021
14. NSF, Division Of Computer and Network Systems
    - title: "TWC: Small: Fundamental Limits in Differential Privacy"
    - PI: Sewoong Oh
    - total funding: $495,190
    - duration: 09/01/2015-08/31/2019
15. NSF, Division Of Civil, Mechanical & Manufacturing Innovation
    - title: "EAGER: A Graphical Approach for Choice Modeling"
    - PI: Sewoong Oh
    - total funding: $87,937

- duration: 01/01/2015-12/31/2015

Internal grants

1. University of Illinois, Strategic Instructional Initiatives Program
   - title: "Adaptive learning via big-data, the future of student-focused instruction"
   - PIs: M. West (lead), G. Dullerud, S. Oh, C. Zilles
   - total funding: $240,000
   - duration: 07/01/2013-06/30/2015
   - funds allocated to S. Oh: $20,000
2. University of Illinois, Strategic Research initiatives
   - title: "Big-Data Analytics in Resource-constrained Regime: Statistical Limits and Computational Challenges"
   - PIs: Y. Wu (lead), C. Chekuri, B. Hajek, S. Oh, R. Srikant
   - total funding: $150,000
   - duration: 07/01/2014-06/30/2016
   - funds allocated to S. Oh: $75,000

Students and Postdoc Advising

Ph.D. Advisees

- Kiran Koshy Thekmparampil
  - Expected Graduation with Ph.D. from UIUC (6/31/2022)
- Ashok Vardhan Makkuva (co-advised with Pramod Viswanath)
  - Expected Graduation with Ph.D. from UIUC (8/15/2022)
- Xiyang Liu
  - Expected Graduation (12/15/2023)
- Raghav Somani
  - Expected Graduation (6/15/2024)
- Jonathan Hayase
  - Expected Graduation (6/15/2025)
- Melih Yilmaz (co-advised with William Noble)
  - Expected Graduation (6/15/2025)
- Thao Nguyen (co-advised with Ludwig Schmidt)
  - Expected Graduation (6/15/2026)

Undergraduate research advisees

- Rishi Jha (3/2021-present)

Alumni

- Shiyu Liang
  - Postdoctoral researcher (12/2021-6/2022)
  - placement: Tenure track assistant professor at Shanghai Jiao Tong University, China
- Jungseul Ok
  - Postdoctoral researcher (8/2018-8/2019)

  - placement: Tenure track assistant professor at POSTECH, Korea
- Hyeji Kim (co-advised with Pramod Viswanath)
  - Postdoctoral researcher (8/2016-8/2018)
  - placement: Tenure track assistant professor at University of Texas at Austin
- Weihao Gao (co-advised with Pramod Viswanath)
  - Graduated with Ph.D. from UIUC (5/11/2019)
  - thesis title: "Information theory meets big data: Theory, algorithms and applications to deep learning"
  - placement: ByteDance
- Ashish Khetan
  - Graduation with PhD from UIUC (5/11/2018)
  - thesis title "Social computation: fundamental limits and efficient algorithms"
  - placement: Amazon AI
- Peter Kairouz (co-advised with Pramod Viswanath)
  - Graduation with Ph.D. from UIUC (5/10/2016)
  - thesis title "The Fundamental Limits of Statistical Data Privacy"
  - placement: Postdoctoral Researcher at Stanford, now at Google Research

Ph.D. Committees

- Josh Gardner, Dimitrios Gklezakos, Sandesh Mohan Adhikary, Omid Sadeghi, Ayse Berceste Dincer , Johannes Staffan Anders Linder (advisor: Georg seelig), Yihan Jiang (advisor: Sreeram Kannan), Anne Wagner (advisor: Marina Meila-Predoviciu), Sudipto Mukherjee (advisor: Sreeram Kannan), John Thickstun (advisor: Zaid Harchaoui, Sham Kakade), Xin Yang (advisor: Paul Beame), Yue Sun (advisor: Maryam Fazel), James Yifei Yang (advisor: Bruce Hajek, UIUC), Jiaming Xu (advisor: Bruce Hajek, UIUC), Pengkun Yang (advisor: Yihong Wu,UIUC)

Professional Services

- Editorial
  - Guest Editor: Journal on Selected Areas in Information Theory (JSAIT), 2020
  - Editor: IEEE BITS, the Information Theory Magazine, 2021-present
- Conference chair:
  - General co-chair: ACM SIGMETRICS conference 2017 (UIUC, Illinois)
  - Registration Chair: ACM SIGMETRICS conference 2014 (Austin, TX)
- Technical Program Committees:
  - TPC member for ACM SIGMETRICS conference (2014–2016,2018,2019,2021), PC member of Conference on Learning Theory (COLT) 2021-present
  - Senior Program Committee of the International Conference on Artificial Intelligence and Statistics (AISTATS) (2019, 2022)
  - Area Chair for Neural Information Processing Systems (NeurIPS) (2020-present), International Conference on Machine Learning (ICML) (2019-present), and AAAI Conference on Artificial Intelligence (AAAI), International Conference on Learning Representation (ICLR) (2022)
- Workshop organizer:
  - ICML 2016 Workshop on Advanced in Non-convex Analysis and Optimization

  - NeurIPS 2015 Workshop on Non-convex Optimization for Machine Learning: Theory and Practice
  - NeurIPS 2014 Workshop on Analysis of Rank Data: Confluence of Social Choice, Operations Research, and Machine Learning

- Journal refereeing:
  Proceedings of the National Academy of Sciences (PNAS), Journal of Machine Learning Research (JMLR), IEEE Transactions on Information Theory, Annals of Statistics, IEEE Transactions on Networking, IEEE Transactions on Signal Processing, IEEE Transactions on Knowledge and Data Engineering, Constructive Approximation, Stochastic Systems, Management Science (MS), IEEE Transactions on Network Science and Engineering (TNSE), Discrete Applied Mathematics, Bernoulli, Journal of Artificial Intelligence Research (JAIR), ACM Transactions on Modeling and Performance Evaluation of Computing Systems (ToMPECS),
- Conference refereeing:
  Artificial Intelligence and Statistics (AISTATS), Neural Information Processing Systems (NeurIPS), International Conference on Machine Learning (ICML), International Conference on Learning Representations (ICLR), IEEE International Symposium on Information Theory (ISIT), IEEE Information Theory Workshop (ITW), Conference on Learning Theory (COLT), Manufacturing and Service Operations Management Society (MSOM)
- Panels: NSF CISE 2021; NSF RI 2020; NSF CISE 2019; NSF RI 2017; NSF SaTC 2017; the European Research Council 2020,

University Services

Department

- co-Chair of Graduate Admissions Committee, 2021-2022 (with Stefano Tessaro)
- co-Chair of Graduate Admissions Committee, 2020-2021 (with Rastislav Bodik)
- IDSG Data Science Master's program, 2019-2020