

Sewoong Oh (last updated 12/18/2024)

CONTACT	Bill & Melinda Gates Center, room 207 University of Washington Seattle, WA 98195	sewoong@cs.washington.edu https://homes.cs.washington.edu/~sewoong/
EDUCATION	Stanford University , Stanford, CA, USA <i>Ph.D. in Electrical Engineering</i> Advisor: Andrea Montanari Dissertation: “Matrix Completion: Fundamental Limits and Efficient Algorithms”	Sep 07 – Jan 11
	Stanford University , Stanford, CA, USA <i>Master of Science in Electrical Engineering</i>	Sep 05 – Jun 07
	Seoul National University , Seoul, Korea <i>Bachelor of Science in Electrical Engineering</i>	Mar 1998 – Mar 02
APPOINTMENTS	Professor - University of Washington Paul G. Allen School of Computer Science & Engineering	Sep 23 – present
	Staff Research Scientist - Google , Seattle, WA	Mar 22 – Sep 24
	Associate Professor - University of Washington Paul G. Allen School of Computer Science & Engineering	Jan 19 – Sep 23
	Visiting Scholar - Google, Cloud AI, Mountain View, CA	May 17 – Aug 17
	Associate Professor - University of Illinois at Urbana-Champaign Department of Industrial and Enterprise Systems Engineering	Aug 18 – Dec 18
	Assistant Professor - University of Illinois at Urbana-Champaign Department of Industrial and Enterprise Systems Engineering	July 12 – Aug 18
	Massachusetts Institute of Technology , Cambridge, MA, USA <i>Postdoctoral Researcher at Laboratory for Information and Decision Systems (LIDS)</i> Mentor: Devavrat Shah	Jan 11 – July 12
HONORS AND AWARDS	<ul style="list-style-type: none">• GOOGLE Research Award, 2022• Member of \$20M NSF AI institute, ACTION (AI Institute for Agent-based Cyber Threat Intelligence and OperatioN), 2023• 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 <ul style="list-style-type: none">• CSE493S “Advanced Machine Learning”, 2025Sp	

- CSE515 “Statistical Methods in Computer Science”, 2020Wi, 2021Wi
- CSE446/546 “Machine Learning”, 2021Sp, 2025Wi
- 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. Jonathan Hayase, Alisa Liu, Yejin Choi, Sewoong Oh, Noah A. Smith, “Data Mixture Inference: What do BPE Tokenizers Reveal about their Training Data?”, *Neural Information Processing Systems (NeurIPS)*, 2024
2. Thao Nguyen, Matthew Wallingford, Sebastin Santy, Wei-Chiu Ma, Sewoong Oh, Ludwig Schmidt, Pang Wei Koh, Ranjay Krishna, “Multilingual Diversity Improves Vision-Language Representations”, *Neural Information Processing Systems (NeurIPS)*, 2024
3. Jeffrey Li, Alex Fang, Georgios Smyrnis, Maor Ivgi, Matt Jordan, Samir Gadre, Hritik Bansal, Etash Guha, Sedrick Keh, Kushal Arora, Saurabh Garg, Rui Xin, Niklas Muenninghoff, Reinhard Heckel, Jean Mercat, Mayee Chen, Suchin Gururangan, Mitchell Wortsman, Alon Albalak, Yonatan Bitton, Marianna Nezhurina, Amro Abbas, Cheng-Yu Hsieh, Dhruva Ghosh, Josh Gardner, Maciej Kilian, Hanlin Zhang, Rulin Shao, Sarah Pratt, Sunny Sanyal, Gabriel Ilharco, Giannis Daras, Kalyani Marathe, Aaron Gokaslan, Jieyu Zhang, Khyathi Chandu, Thao Nguyen, Igor Vasiljevic, Sham Kakade, Shuran Song, Sujay Sanghavi, Fartash Faghri, Sewoong Oh, Luke Zettlemoyer, Kyle Lo, Alaaeldin El-Nouby, Hadi Pouransari, Alexander Toshev, Stephanie Wang, Dirk Groeneveld, Luca Soldani, Pang Wei Koh, Jenia Jitsev, Thomas Kollar, Alexandros G Dimakis, Yair Carmon, Achal Dave, Ludwig Schmidt, Vaishaal Shankar, “DataComp-LM: In search of the next generation of training sets for language models”, *Neural Information Processing Systems (NeurIPS)*, 2024
4. Divyansh Pareek, Simon S. Du, Sewoong Oh, “Understanding the Gains from Repeated Self-Distillation”, *Neural Information Processing Systems (NeurIPS)*, 2024
5. Thao Nguyen, Jeffrey Li, Sewoong Oh, Ludwig Schmidt, Jason Weston, Luke Zettlemoyer, Xian Li, “Better Alignment with Instruction Back-and-Forth Translation”, *Empirical Methods in Natural Language Processing (EMNLP)*, 2024
6. Eugene Bagdasaryan, Ren Yi, Sahra Ghalebikesabi, Peter Kairouz, Marco Gruteser, Sewoong Oh, Borja Balle, Daniel Ramage, “AirGapAgent: Protecting Privacy-Conscious Conversational Agents”, *ACM Conference on Computer and Communications Security (CCS)*, 2024
7. Gavin Brown, Jonathan Hayase, Samuel Hopkins, Weihao Kong, Xiyang Liu, Sewoong Oh, Juan C. Perdomo, Adam Smith, “Insufficient Statistics Perturbation: Stable Estimators for Private Least Squares”, *Conference on Learning Theory (COLT)*, 2024
8. Boxin Wang, Yibo Jacky Zhang, Yuan Cao, Bo Li, H Brendan McMahan, Sewoong Oh, Zheng Xu, Manzil Zaheer, “Can Public Large Language Models Help Private Cross-device Federated Learning?”, *Annual Conference of the Nations of the Americas Chapter of the Association for Computational Linguistics (NAACL)*, 2024
9. *International Conference on Machine Learning (ICML)*, 2024

10. Liang Zhang, Bingcong Li, Kiran Koshy Thekumparampil, Sewoong Oh, Niao He, “DPZero: Private Fine-Tuning of Language Models without Backpropagation”, *International Conference on Machine Learning (ICML)*, 2024
11. Da Yu, Peter Kairouz, Sewoong Oh, Zheng Xu, “Privacy-Preserving Instructions for Aligning Large Language Models”, *International Conference on Machine Learning (ICML)*, 2024
12. S Ashwin Hebbar, Sravan Kumar Ankireddy, Hyeji Kim, Sewoong Oh, Pramod Viswanath, “DeepPolar: Inventing Nonlinear Large-Kernel Polar Codes via Deep Learning”, *International Conference on Machine Learning (ICML)*, 2024
13. Andrew, Galen, Peter Kairouz, Sewoong Oh, Alina Oprea, H. Brendan McMahan, and Vinith Suriyakumar, “One-shot Empirical Privacy Estimation for Federated Learning”, *International Conference on Machine Learning (ICML)*, 2024 (**Oral presentation**)
14. Rishi D. Jha, Jonathan Hayase, Sewoong Oh, “Label Poisoning is All You Need”, *Neural Information Processing Systems (NeurIPS)*, 2023
15. Krishna Pillutla, Galen Andrew, Peter Kairouz, Brendan McMahan, Alina Oprea, Sewoong Oh, “Unleashing the power of randomization in auditing differentially private ML”, *Neural Information Processing Systems (NeurIPS)*, 2023
16. Xiyang Liu, Prateek Jain, Weihao Kong, Sewoong Oh, Arun Sai Suggala, “Near Optimal Private and Robust Linear Regression”, *Neural Information Processing Systems (NeurIPS)*, 2023
17. Arun Ganesh, Daogao Liu, Sewoong Oh, Abhradeep Thakurta, “Private (Stochastic) Non-Convex Optimization Revisited: Second-Order Stationary Points and Excess Risks”, *Neural Information Processing Systems (NeurIPS)*, 2023
18. Vivek Ramanujan, Thao Nguyen, Sewoong Oh, Ludwig Schmidt, Ali Farhadi, “On the Connection between Pre-training Data Diversity and Fine-tuning Robustness”, *Neural Information Processing Systems (NeurIPS)*, 2023 (**Spotlight presentation**)
19. Thao Nguyen, Samir Yitzhak Gadre, Gabriel Ilharco, Sewoong Oh, Ludwig Schmidt, “Improving multimodal datasets with image captioning”, *Neural Information Processing Systems (NeurIPS)*, 2023
20. Samir Yitzhak Gadre, Gabriel Ilharco, Alex Fang, Jonathan Hayase, Georgios Smyrnis, Thao Nguyen, Ryan Marten, Mitchell Wortsman, Dhruva Ghosh, Jieyu Zhang, Eyal Orgad, Rahim Entezari, Giannis Daras, Sarah Pratt, Vivek Ramanujan, Yonatan Bitton, Kalyani Marathe, Stephen Mussmann, Richard Vencu, Mehdi Cherti, Ranjay Krishna, Pang Wei Koh, Olga Saukh, Alexander Ratner, Shuran Song, Hannaneh Hajishirzi, Ali Farhadi, Romain Beaumont, Sewoong Oh, Alex Dimakis, Jenia Jitsev, Yair Carmon, Vaishal Shankar, Ludwig Schmidt, “DataComp: In search of the next generation of multimodal datasets”, *Neural Information Processing Systems (NeurIPS)*, 2023 (**Oral presentation**)
21. Enayat Ullah, Christopher Choquette, Peter Kairouz, Sewoong Oh, “Private federated learning with autotuned compression”, *International Conference on Machine Learning (ICML)*, 2023
22. Arun Ganesh, Mahdi Haghifam, Milad Nasr, Sewoong Oh, Thomas Steinke, Om Thakkar, Abhradeep Thakurta, Lun Wang, “Why Is Public Pretraining Necessary for Private Model Training?”, *International Conference on Machine Learning (ICML)*, 2023,
23. S Ashwin Hebbar, Viraj Nadkarni, Ashok Vardhan Makkuva, Suma Bhat, Sewoong Oh, Pramod Viswanath, “CRISP: Curriculum based Sequential Neural Decoders for Polar Code Family”, *International Conference on Machine Learning (ICML)*, 2023,

24. Zheng Xu, Maxwell Collins, Yuxiao Wang, Liviu Panait, Sewoong Oh, Sean Augenstein, Ting Liu, Florian Schroff, H. Brendan McMahan, “Learning to Generate Image Embeddings with User-level Differential Privacy”, *IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR) 2023*,
25. Jonathan Hayase, Sewoong Oh, “Few-shot Backdoor Attacks via Neural Tangent Kernels”, *International Conference on Learning Representations (ICLR), 2023*
26. Matt Jordan, Jonathan Hayase, Alexandros G Dimakis, Sewoong Oh, “Zonotope Domains for Lagrangian Neural Network Verification”, *Neural Information Processing Systems (NeurIPS), 2022*,
27. Thao Nguyen, Gabriel Ilharco, Mitchell Wortsman, Sewoong Oh, Ludwig Schmidt, “Quality Not Quantity: On the Interaction between Dataset Design and Robustness of CLIP”, *Neural Information Processing Systems (NeurIPS), 2022 (Oral presentation)*
28. Liang Zhang, Kiran Koshy Thekumparampil, Sewoong Oh, Niao He, “Bring Your Own Algorithm for Optimal Differentially Private Stochastic Minimax Optimization”, *Neural Information Processing Systems (NeurIPS), 2022*
29. Xiyang Liu, Weihao Kong, Prateek Jain, Sewoong Oh, “DP-PCA: Statistically Optimal and Differentially Private PCA”, *Neural Information Processing Systems (NeurIPS), 2022*
30. Liam Collins, Aryan Mokhtari, Sewoong Oh, Sanjay Shakkottai, “MAML and ANIL Provably Learn Representations”, *international Conference on Machine Learning (ICML), 2022*
31. 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*
32. Xiyang Liu, Weihao Kong, Sewoong Oh, “Differential privacy and robust statistics in high dimensions”, *Conference on Learning Theory (COLT), 2022*
33. Kiran Koshy Thekumparampil, Niao He, Sewoong Oh, “Lifted Primal-Dual Method for Bilinearly Coupled Smooth Minimax Optimization”, *AISTATS, 2022 (Oral presentation)*
34. Xingyu Wang, Sewoong Oh, Chang-Han Rhee, “Eliminating Sharp Minima from SGD with Truncated Heavy-tailed Noise”, *International Conference on Learning Representations (ICLR), 2022*
35. Charlie Hou, Kiran K. Thekumparampil, Giulia Fanti, Sewoong Oh, “Reducing the Communication Cost of Federated Learning through Multistage Optimization”, *International Conference on Learning Representations (ICLR), 2022*
36. Xiyang Liu, Weihao Kong, Sham Kakade, Sewoong Oh, “Robust and Differentially Private Mean Estimation,” *Neural Information Processing Systems (NeurIPS), 2021*
37. Kiran Koshy Thekumparampil, Prateek Jain, Praneeth Netrapalli, Sewoong Oh, “Sample Efficient Linear Meta-Learning by Alternating Minimization”, *Neural Information Processing Systems (NeurIPS), 2021*
38. 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*
39. Jaechang Kim, Jinwoo Jeon, Kangwook Lee, Sewoong Oh, and Jungseul Ok, “Gradient Inversion with Generative Image Prior”, *Neural Information Processing Systems (NeurIPS), 2021*
40. Jonathan Hayase, Weihao Kong, Raghav Somani, Sewoong Oh, SPECTRE: Defending against backdoor attacks using robust covariance estimation, *international Conference on Machine Learning (ICML), 2021*

41. Ashok Vardhan Makkuva, Xiyang Liu, Mohammad Vahid Jamali, Hessam Mahdavifar, Sewoong Oh, Pramod Viswanath, “KO codes: Inventing Nonlinear Encoding and Decoding for Reliable Wireless Communication via Deep-Learning”, *International Conference on Machine Learning (ICML)*, 2021
42. 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
43. 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)**
44. Weihao Kong, Raghav Somani, Sham Kakade, Sewoong Oh, “Robust Meta-learning for Mixed Linear Regression with Small Batches”, *Neural Information Processing Systems (NeurIPS)*, 2020
45. 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
46. Weihao Kong, Raghav Somani, Zhao Song, Sham Kakade, Sewoong Oh, “Meta-learning for mixed linear regression”, *International Conference on Machine Learning (ICML)*, 2020
47. 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
48. Ashok Vardhan Makkuva, Sewoong Oh, Sreeram Kannan, Pramod Viswanath, “Learning in Gated Neural Networks”, *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020
49. 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
50. Kiran Koshy Thekumparampil, Prateek Jain, Praneeth Netrapalli, Sewoong Oh, “Efficient Algorithms for Smooth Minimax Optimization”, *Neural Information Processing Systems (NeurIPS)*, 2019
51. Xiyang Liu, Sewoong Oh, “Minimax Rates of Estimating Approximate Differential Privacy”, *Neural Information Processing Systems (NeurIPS)*, 2019
52. 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
53. 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
54. 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)**
55. 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
56. 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

57. 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
58. 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
59. 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**),
60. 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,
61. 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,
62. H. Kim, Y. Jiang, R. B. Rana, S. Kannan, S. Oh, and P. Viswanath, “Communication Algorithms via Deep Learning”, *International Conference on Learning Representations (ICLR)*, Vancouver, Canada, April 2018
63. 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**),
64. 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,
65. 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,
66. A. Khetan, S. Oh, “Matrix Norm Estimation from a Few Entries”, *Neural Information Processing Systems (NIPS)*, Long Beach, CA, 2017, (**Spotlight presentation**),
67. W. Gao, S. Oh, and P Viswanath, “Density Functional Estimators with k-Nearest Neighbor Bandwidths”, *International Symposium on Information Theory (ISIT)*, 2017
68. W. Gao, S. Oh, and P. Viswanath, “Demystifying Fixed k-Nearest Neighbor Information Estimators”, *International Symposium on Information Theory (ISIT)*, 2017
69. W. Gao, S. Oh, and P. Viswanath, “Breaking the Bandwidth Barrier: Geometrical Adaptive Entropy Estimation”, *Neural Information Processing Systems (NIPS)*, Barcelona, Spain, 2016
70. A. Khetan and S. Oh, “Computational and Statistical Tradeoffs in Learning to Rank”, *Neural Information Processing Systems (NIPS)*, Barcelona, Spain, 2016
71. A. Khetan and S. Oh, “Achieving budget-optimality with adaptive schemes in crowd-sourcing”, *Neural Information Processing Systems (NIPS)*, Barcelona, Spain, 2016
72. 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,
73. A. Khetan, S. Oh, “Data-driven Rank Breaking for Efficient Rank Aggregation”, *International Conference on Machine Learning (ICML)*, New York, 2016,
74. J. Ok, S. Oh, J. Shin, Y. Yi, “Optimality of Belief Propagation for Crowdsourced Classification”, *International Conference on Machine Learning (ICML)*, New York, 2016,

75. G. Fanti, P. Kairouz, S. Oh, K. Ramchandran and P. Viswanath, “Metadata-conscious Anonymous Messaging”, *International Conference on Machine Learning (ICML)*, New York, 2016,
76. G. Fanti, P. Kairouz, S. Oh, K. Ramchandran and P. Viswanath, “Rumor Source Obfuscation on Irregular Trees”, *ACM SIGMETRICS*, Antibes, France, 2016
77. P. Kairouz, S. Oh, and P. Viswanath, “Secure Multi-party Differential Privacy”, *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2015
78. S. Oh, K. K. Thekumparampil, and J. Xu, “Collaboratively Learning Preferences from Ordinal Data”, *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2015
79. S. Krishnasamy, R. Sen, S. Oh, and S. Shakkottai, “Detecting Sponsored Recommendations”, *Proceedings of the 2014 ACM SIGMETRICS* Portland, Oregon, June 2015
80. 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**),
81. P. Kairouz, S. Oh, and P. Viswanath, “Extremal Mechanisms for Local Differential Privacy”, *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2014,
82. P. Jain and S. Oh, “Provable Tensor Factorization with Missing Data”, *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2014,
83. B. Hajek, S. Oh, and J. Xu, “Minimax-optimal Inference from Partial Rankings”, *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2014,
84. S. Oh and D. Shah , “Learning Mixed Multinomial Logit Model from Ordinal Data”, *Neural Information Processing Systems (NIPS)*, Montreal, Canada, 2014,
85. 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,
86. 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,
87. 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,
88. D. R. Karger, S. Oh, D. Shah, “Efficient Crowdsourcing for Multi-class Labeling,” *Proceedings of the 2013 ACM SIGMETRICS*, CMU, Pittsburgh, PA, July 2013,
89. S. Negahban, S. Oh, and D. Shah, “Iterative Ranking from Pairwise Comparisons,” *Neural Information Processing Systems (NIPS)*, Lake Tahoe, CA, December 2012, (**Spotlight Presentation**),
90. D. R. Karger, S. Oh, D. Shah, “Iterative learning for reliable crowdsourcing systems,” *Neural Information Processing Systems (NIPS)*, Granada, Spain, December 2011. (**Oral Presentation**),
91. 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.
92. S. Korada, A. Montanari, S. Oh, “Gossip PCA,” *Proceedings of the 2011 ACM SIGMETRICS*, San Jose, CA, June 2011,
93. A. Montanari, S. Oh, “On positioning via distributed matrix completion,” *Sensor Array and Multichannel Signal Processing Workshop*, Jerusalem, Israel, October 2010.

94. 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.
95. 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**),
96. 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.
97. R. H. Keshavan, A. Montanari, S. Oh, "Matrix completion from noisy entries," *Neural Information Processing Systems (NIPS)*, Vancouver, Canada, December 2009,
98. 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.
99. 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.
100. 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.
101. 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.
102. 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.
103. 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. Melih Yilmaz, William E. Fondrie, Wout Bittremieux, Carlo F. Melendez, Rowan Nelson, Varun Ananth, Sewoong Oh, William Stafford Noble, "Sequence-to-sequence translation from mass spectra to peptides with a transformer model", *Nature Communications*, 2024, 15(1), pp.6427
2. Carlo Melendez, Justin Sanders, Melih Yilmaz, Wout Bittremieux, William E Fondrie, Sewoong Oh, William Stafford Noble, "Accounting for digestion enzyme bias in Casanovo", *Journal of Proteome Research*, 2024,
3. Krishna Pillutla, Lang Liu, John Thickstun, Sean Welleck, Swabha Swayamdipta, Rowan Zellers, Sewoong Oh, Yejin Choi, Zaid Harchaoui, "MAUVE scores for generative models: Theory and practice", *Journal of Machine Learning Research*, 2023
4. Shuaiqi Wang, Jonathan Hayase, Giulia Fanti, Sewoong Oh, , "Towards a Defense Against Federated Backdoor Attacks Under Continuous Training", *Transactions on Machine Learning Research (TMLR)*, 2023
5. Mohammad Vahid Jamali, Xiyang Liu, Ashok Vardhan Makkuva, Hessam Mahdaviifar, Sewoong Oh, Pramod Viswanath, "Machine Learning-Aided Efficient Decoding of Reed-Muller Subcodes", *IEEE Transactions on Selected Areas in Information Theory (JSAIT)*, 2023

6. Sewoong Oh, Soumik Pal, Raghav Somani, Raghavendra Tripathi, "Gradient flows on graphons: existence, convergence, continuity equations", *Journal of Theoretical Probability*, 2023, presented at the NeurIPS 2021 workshop on Optimal Transport and Machine Learning
7. L Harris, WE Fondrie, S Oh, WS Noble, "Evaluating proteomics imputation methods with improved criteria", *Journal of Proteome Research*, 2023, 22 (11), 3427-3438
8. AB Dincer, Y Lu, DK Schweppe, S Oh, WS Noble, "Reducing peptide sequence bias in quantitative mass spectrometry data with machine learning", *Journal of Proteome Research*, 2022, 21 (7), 1771-1782
9. Rachel Cummings, Damien Desfontaines, David Evans, Roxana Geambasu, Matthew Jagielski, Yangsibo Huang, Peter Kairouz, Gautam Kamath, Sewoong Oh, Olga Ohri-menko, Nicolas Papernot, Ryan Rogers, Milan Shen, Shuang Song, Weijie Su, Andreas Terzis, Abhradeep Thakurta, Sergei Vassilvitskii, Yu-Xiang Wang, Li Xiong, Sergey Yekhanin, Da Yu, Huanyu Zhang, Wanrong Zhang, "Advancing Differential Privacy: Where We Are Now and Future Directions for Real-World Deployment", *Harvard Data Science Review*, 6(1), January 2024
10. 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
11. 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
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14. Ashish Khetan, Sewoong Oh, "Spectrum Estimation from a Few Entries", *Journal of Machine Learning Research*, Vol.20, Issue:21, January 2019
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23. 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
24. 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
25. 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
26. 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.
27. S. Negahban, S. Oh, and D. Shah, "RankCentrality: Ranking from Pair-wise Comparisons," *Operations Research*, Vol.65, no.1, pp.266-287, October 2016
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29. 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.
30. A. Karbasi, S. Oh, "Robust localization from incomplete local information," *IEEE Trans. on Networking*, Vol 21 pp.1131-1144, August 2013.
31. 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.
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GRANTS

External grants

1. Microsoft Grant for Customer Experience Innovation
 - PI: Sewoong Oh
 - total funding: \$300,000 (gift money)
 - date: 9/2023
2. NSF DMS-2245300
 - title: "DMS/NIGMS 2: Deep learning for repository-scale analysis of tandem mass spectrometry proteomics data"
 - PI: William Noble
 - Sewoong Oh: senior personnel
 - total funding: \$1,199,760
 - duration: 6/15/2023-5/31/2027
3. NSF IIS-2229876
 - title: "AI Institute for Agent-based Cyber Threat Intelligence and Operation"

- Lead PI: Giovanni Vigna (UCSB)
 - Sewoong Oh: Senior Personnel
 - total funding: \$20,000,000
 - duration: 6/1/2023 - 5/31/2028
 - funds allocated to University of Washington: \$1,200,000
4. NSF DMS-2134012
- 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
5. 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
6. NSF CNS-2112471
- 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
7. NSF CCF-2019844
- 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
8. NSF CNS-2002664
- 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
9. 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
10. NSF IIS-1929955
- 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
11. 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
12. 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),
13. NVIDIA GPU grant
- title: “Counting network motifs with neural networks”
 - PI: Sewoong Oh
 - total funding: Quadro P5000,
 - date: 2/2018
14. 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
15. NSF CCF-1705007
- 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

16. NSF CCF-1927712
 - title: “CAREER: Social Computation: Fundamental Limits and Efficient Algorithms”
 - PI: Sewoong Oh
 - total funding: \$457,685
 - duration: 2/15/2016-2/14/2021
17. NSF CNS-1527754
 - title: “TWC: Small: Fundamental Limits in Differential Privacy”
 - PI: Sewoong Oh
 - total funding: \$495,190
 - duration: 09/01/2015-08/31/2019
18. NSF CMMI-1450848
 - 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

Postdoc Advisees

- Gavin Brown

Ph.D. Advisees

- Jonathan Hayase
 - Expected Graduation (6/15/2026)
- Melih Yilmaz (co-advised with William Noble)
 - Expected Graduation (6/15/2025)
- Thao Nguyen (co-advised with Ludwig Schmidt)
 - Expected Graduation (6/15/2026)

- Eric Frankel
 - Expected Graduation (6/15/2028)
- Anshul Nasery
 - Expected Graduation (6/15/2028)
- Divyansh Pareek
 - Expected Graduation (6/15/2028)
- Rui Xin
 - Expected Graduation (6/15/2028)
- Sebastin Santy
 - Expected Graduation (6/15/2027)

Alumni

- Xiyang Liu
 - Graduated with Ph.D. from UW (8/2024)
 - placement: Snap
- Raghav Somani
 - Graduated with PH.D. from UW (8/2024)
 - placement: D. E. Shaw
- 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
- Kiran Koshy Thekmpampil
 - Graduated with Ph.D. from UIUC (6/31/2022)
 - thesis title: “Efficient and robust algorithms for training machine learning models”
 - placement: Amazon
- 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
- Rishi Jha
 - Graduated with B.S. from University of Washington (3/2021-8/2023)

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-Predovicu), 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:
 - TPC co-chair: ACM SIGMETRICS conference 2025 (Stony Brook, NY)
 - 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)