Anand D. Sarwate — Curriculum Vitæ

Contact Information

Assistant Professor
Department of Electrical and Computer Engineering
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Research Interests

I am broadly interested in statistical algorithms and methods applied to problems in distributed systems, communications, and privacy and security.

Education

1/06–7/08 **University of California, Berkeley**, (Berkeley, California USA)
Ph.D., Electrical Engineering and Computer Sciences (awarded 12/2008)
Designated Emphasis in Communication, Computation and Statistics
Thesis: *Robust and adaptive communication under uncertain interference*
Advisor: Professor Michael Gastpar

8/02–12/05 **University of California, Berkeley**, (Berkeley, California USA)
M.S., Electrical Engineering and Computer Sciences (awarded 12/2005)
Thesis : *Observation uncertainty in Gaussian sensor networks*
Advisor: Professor Michael Gastpar

9/97–6/02 **Massachusetts Institute of Technology**, (Cambridge, Massachusetts USA)
B.S., Electrical Science and Engineering (awarded 6/2002)
B.S., Mathematics (awarded 6/2002)
Minors in Music and Theater Arts

Employment

7/20– **Rutgers, The State University of New Jersey**, (Piscataway, New Jersey USA)
Associate Professor

1/14–6/20 **Rutgers, The State University of New Jersey**, (Piscataway, New Jersey USA)
Assistant Professor

10/11–12/13 **Toyota Technological Institute at Chicago**, (Chicago, Illinois USA)
Research Assistant Professor

9/08–9/11 **University of California, San Diego**, (La Jolla, California USA)
Postdoctoral Researcher
Supervisors: Professors Alon Orlitsky, Tara Javidi, and Young-Han Kim

Awards and Honors

Board of Trustees Research Fellowship for Scholarly Excellence, 2020

A. Walter Tyson Assistant Professor Award, Rutgers School of Engineering, 2018

NSF CAREER Award, 2015

IEEE Senior Member

NIPS Reviewer Award, 2013

Demetri Angelakos Memorial Achievement Award, UC Berkeley Department of EECS, 2008

Samuel Silver Memorial Scholarship Award, UC Berkeley Department of EECS, 2007

National Defence Science and Engineering Graduate Fellowship, 2002–2005

MIT : Laya and Jerome B. Wiesner Student Art Award, Joseph Everingham Award (Theater), Philip Lowe Memorial Award (Music)

Research Support

NIH — 2R01DA040487 : *$623,113*, 9/30/2020–6/30/2025
COINSTAC 2.0: Decentralized, Scalable Analysis of Loosely Coupled Data This is a continuation of the COINSTAC project (see below) to develop a system for automated and privacy-sensitive statistical analyses of data from neuroimaging researchers studying the same condition at different sites.

NSF — CCF-1910110 : *$499,976*, 10/1/2019–9/30/2022
CIF: Small: ESTRELLA: Exploiting Structure in Tensors for Representation, Estimation, and Limits of Learning Algorithms
PI: Anand D. Sarwate, Co-PI: Waheed Bajwa (Rutgers)
This project pursues a comprehensive theory to simplify the measurement, storage, and statistical modeling of tensor-structured data.

NSF — CCF-1909468: *$250,000*, 10/1/2019–9/30/2022
CIF: Small: Collaborative Research: Between Shannon and Hamming
PI: Anand D. Sarwate, Co-PI: Michael Langberg (U. Buffalo)
This proposal studies fundamental coding strategies communication over channels in which the interference lies between the average and worst-case models.

NSF — SaTC-1617849: *$500,000.00*, 9/1/2016–8/31/2020
TWC: Small: PERMIT: Privacy-Enabled Resource Management for IoT Networks
PI: Anand D. Sarwate, Co-PI: Narayan Mandayam
This proposal studies how privacy, utility, and bandwidth affect each other in networked data collection and information processing systems.

Verisign — Gift: *$25,000*, 11/2015
Differential Privacy, Multi-target Search, and Anomaly Detection

PIs: Rebecca Wright, Anand D. Sarwate Gift through DIMACS Center to work on applied and theoretical privacy.

DHS — Subcontract from CICCADA: *$125,000*, 10/1/2015–6/30/2016
PIs: Rebecca Wright, Anand D. Sarwate
DPAD: Differentially Private Anomaly Detection
This work seeks to understand how and when we can safely detect anomalies in private data.

NSF — CCF-1525276: *$160,000.00*, 9/1/2015–8/31/2017
CIF: Small: Active data screening for efficient feature learning
PI: Waheed Bajwa, Co-PI: Anand D. Sarwate
This proposal develops methods for screening samples to use for dictionary learning algorithms to balance representation accuracy and computational efficiency.

NIH — 1R01DA040487-01A1: *$692,575*, 07/01/2015–04/30/2020
COINSTAC: Decentralized, Scalable Analysis of Loosely Coupled Data
PI: Vince Calhoun (Georgia State), subcontract to Rutgers (PI: Anand D. Sarwate)
This proposal is to develop a system for automated and privacy-sensitive statistical analyses of data from neuroimaging researchers studying the same condition at different sites.

NSF — CCF-1453432: *$540,000.00*, 7/1/2015–6/30/2020
CAREER: Privacy-preserving learning for distributed data
PI: Anand D. Sarwate
This proposal develops key design principles for making practical privacy-preserving distributed learning algorithms and validate them in collaboration with neuroimaging researchers. The results will identify new challenges for information processing and machine learning in general distributed systems.

DARPA/Navy — N66001-15-C-4070: *$1,013.723*, 3/15/2015–3/14/2020
Jana: Ensuring Secure, Private and Flexible Data Access
PI: David Archer (Galois, Inc.), subcontract to Rutgers (PI: Rebecca Wright, co-PIs: Anand D. Sarwate, David Cash)
This project is about building a secure database system that uses secure multiparty computing and privacy-preserving algorithms to hold and process queries on data held by multiple parties.

ARL — CTA on Robotics: *$125,526*, 4/16/2014–4/15/2015
Subaward from General Dynamics to Rutgers (PI: Waheed Bajwa, co-PIs: Athina Petropulu, Anand Sarwate)
Active Feature Learning and Classifier Training for Object Recognition
This work was to develop active learning approaches for feature learning for object recognition in rich data such as video. Subaward from General Dynamics.

NSF — CCF-1218331: *$208,426*, 9/1/2012–4/30/2014
CIF: Small: Collaborative Research: Inference by social sampling
PI: Tara Javidi (UCSD), Co-PI: Anand D. Sarwate
This work investigates communication and networking paradigms that can enable a

network of individual agents to collaboratively estimate distributions over high dimensional spaces, even when individual observations are severely limited in accuracy, space, or time.

AcademyHealth EDM Forum: *$5,000*, 11/2011
PI: Xiaoqian Jiang (UCSD), co-PIs: Anand D. Sarwate (TTI-Chicago), Lucila Ohno-Machado (UCSD)
Review of Technologies to Protect Patient Privacy When Sharing Data for Comparative Effectiveness Research
Commissioned paper for a systematic review of privacy-preserving methods for sharing data for medical research.

Preprints

[1] D. S. Kalogerias, K. E. Nikolakakis, A. D. Sarwate, and O. Sheffet, "Best-arm identification for quantile bandits with privacy," ArXiV, Tech. Rep. arXiv:2006.06792 [stat.ML], June 2020. [Online]. Available: https://arxiv.org/abs/2006.06792

[2] K. E. Nikolakakis, D. S. Kalogerias, and A. D. Sarwate, "Predictive learning on sign-valued hidden Markov trees," ArXiV, Tech. Rep. arXiv:1812.04700 [stat.ML], February 2020. [Online]. Available: https://arxiv.org/abs/1812.04700

[3] Y. Zhang, S. Vatedka, S. Jaggi, and A. Sarwate, "Quadratically constrained myopic adversarial channels," ArXiV, Tech. Rep. arXiv:1801.05951v3 [cs.IT], January 2020. [Online]. Available: https://arxiv.org/abs/1801.05951

[4] H. Imtiaz, J. Mohammadi, R. Silva, B. Baker, S. M. Plis, A. D. Sarwate, and V. D. Calhoun, "Improved differentially private decentralized source separation for fMRI data," ArXiV, Tech. Rep. arXiv:1910.12913 [stat.ML], October 2019. [Online]. Available: https://arxiv.org/abs/1910.12913

[5] G. R. Kurri, V. M. Prabhakaran, and A. D. Sarwate, "Coordination through shared randomness," ArXiV, Tech. Rep. arXiv:1908.08407 [cs.IT], August 2019. [Online]. Available: https://arxiv.org/abs/1908.08407

[6] B. K. Dey, S. Jaggi, M. Langberg, and A. D. Sarwate, "The benefit of a 1-bit jump-start, and the necessity of stochastic encoding, in jamming channels," ArXiV, Tech. Rep. arXiv:1602.02384 [cs.IT], February 2016. [Online]. Available: http://arxiv.org/abs/1602.02384

[7] A. D. Sarwate and M. Gastpar, "Relaxing the Gaussian AVC," ArXiV, Tech. Rep. arXiv:1204.2587v1 [cs.IT], September 2012, under revision. [Online]. Available: http://arxiv.org/abs/1209.2755

Journal

[1] D. M. Bittner, A. E. Brito, M. Ghassemi, S. Rane, A. D. Sarwate, and R. N. Wright, "Understanding privacy-utility tradeoffs using differentially private online active learning," *Journal of Privacy and Confidentiality*, vol. 10, no. 2, June 2020. [Online]. Available: https://doi.org/10.29012/jpc.720

[2] M. Ghassemi, Z. Shakeri, A. D. Sarwate, and W. U. Bajwa, "Learning mixtures of separable dictionaries for tensor data: Analysis and algorithms," *IEEE Transactions on Signal Processing*, vol. 68, no. 1, pp. 33–48, January 2020. [Online]. Available: https://dx.doi.org/10.1109/TSP.2019.2952046

[3] T. Hazan, F. Orabona, A. D. Sarwate, S. Maji, and T. Jaakkola, "High dimensional inference with random maximum a-posteriori perturbations," *IEEE Transactions on Information Theory*, vol. 65, no. 10, pp. 6539–6560, October 2019. [Online]. Available: http://dx.doi.org/10.1109/TIT.2019.2916805

[4] B. Baker, A. Abrol, R. F. Silva, E. Damaraju, A. D. Sarwate, V. D. Calhoun, and S. M. Plis, "Decentralized temporal independent component analysis: Leveraging fMRI data in collaborative settings," *NeuroImage*, vol. 186, pp. 557–569, February 2019. [Online]. Available: http://dx.doi.org/10.1016/j.neuroimage.2018.10.072

[5] H. Imtiaz and A. D. Sarwate, "Distributed differentially-private algorithms for matrix and tensor factorization," *IEEE Journal of Selected Topics in Signal Processing*, vol. 12, no. 6, pp. 1449–1464, December 2018. [Online]. Available: http://dx.doi.org/10.1109/JSTSP.2018.2877842

[6] K. Kalantari, L. Sankar, and A. D. Sarwate, "Robust privacy-utility tradeoffs under differential privacy and Hamming distortion," *IEEE Transactions on Information Forensics and Security*, vol. 13, no. 11, pp. 2816–2830, November 2018. [Online]. Available: http://dx.doi.org/10.1109/TIFS.2018.2831619

[7] Z. Shakeri, A. D. Sarwate, and W. U. Bajwa, "Identifiability of Kronecker-structured dictionaries for tensor data," *IEEE Journal of Selected Topics in Signal Processing*, vol. 12, no. 5, pp. 1047–1062, October 2018. [Online]. Available: http://dx.doi.org/10.1109/JSTSP.2018.2838092

[8] A. Lalitha, T. Javidi, and A. D. Sarwate, "Social learning and distributed hypothesis testing," *IEEE Transactions on Information Theory*, vol. 64, no. 9, pp. 6161–6179, September 2018. [Online]. Available: http://dx.doi.org/10.1109/TIT.2018.2837050

[9] Z. Shakeri, W. U. Bajwa, and A. D. Sarwate, "Minimax lower bounds on dictionary learning for tensor data," *IEEE Transactions on Information Theory*, vol. 64, no. 4, pp. 2706–2726, April 2018. [Online]. Available: http://dx.doi.org/10.1109/TIT.2018.2799931

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[11] J. Ming, E. Verner, A. Sarwate, R. Kelly, C. Reed, T. Kahleck, R. Silva, S. Panta, J. Turner, S. Plis, and V. Calhoun, "COINSTAC: Decentralizing the future of brain imaging analysis," *F1000Research*, vol. 6, no. 1512, August 2017. [Online]. Available: http://dx.doi.org/10.12688/f1000research.12353.1

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[14] C. Huang, L. Sankar, and A. D. Sarwate, "Designing incentive schemes for privacy-sensitive users," *Journal of Privacy and Confidentiality*, vol. 7, no. 1, pp. 99–127, March 2016. [Online]. Available: http://repository.cmu.edu/jpc/vol7/iss1/5/

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[18] K. Chaudhuri, A. D. Sarwate, and K. Sinha, "A near-optimal algorithm for differentially-private principal components," *Journal of Machine Learning Research*, vol. 14, pp. 2905–2943, September 2013. [Online]. Available: http://jmlr.org/papers/volume14/chaudhuri13a/chaudhuri13a.pdf

[19] A. D. Sarwate and K. Chaudhuri, "Signal processing and machine learning with differential privacy: theory, algorithms, and challenges," *IEEE Signal Processing Magazine*, vol. 30, no. 5, pp. 86–94, September 2013. [Online]. Available: http://dx.doi.org/10.1109/MSP.2013.2259911

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[26] K. Chaudhuri, C. Monteleoni, and A. D. Sarwate, "Differentially private empirical risk minimization," *Journal of Machine Learning Research*, vol. 12, pp. 1069–1109, March 2011. [Online]. Available: http://jmlr.csail.mit.edu/papers/v12/chaudhuri11a.html

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[28] ——, "Rateless codes for AVC models," *IEEE Transactions on Information Theory*, vol. 56, no. 7, pp. 3105–3114, July 2010. [Online]. Available: http://dx.doi.org/10.1109/TIT.2010.2048497

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Book Chapter

[1] Z. Shakeri, A. D. Sarwate, and W. U. Bajwa, "Sample complexity bounds for dictionary learning from vector- and tensor-valued data," in *Information-Theoretic Methods in Data Science*, M. Rodrigues and Y. C. Eldar, Eds. Cambridge, UK: Cambridge University Press, to appear, 2019.

Extended Versions of Conference Papers

[1] T. Li, B. K. Dey, S. Jaggi, M. Langberg, and A. D. Sarwate, "Quadratically constrained channels with causal adversaries," ArXiV, Tech. Rep. arXiv:1805.03319 [cs.IT], May 2018. [Online]. Available: https://arxiv.org/abs/1805.03319

[2] Y. Zhang, S. Vatedka, S. Jaggi, and A. Sarwate, "Quadratically constrained myopic adversarial channels," ArXiV, Tech. Rep. arXiv:1801.05951 [cs.IT], January 2018. [Online]. Available: https://arxiv.org/abs/1801.05951

[3] S. Song, K. Chaudhuri, and A. D. Sarwate, "Learning from data with heterogeneous noise using SGD," ArXiV, Tech. Rep. arXiv:1412.5617 [cs.LG], December 2014. [Online]. Available: http://arxiv.org/abs/1412.5617

[4] A. Chatterjee, A. D. Sarwate, and S. Vishwanath, "Generalized opinion dynamics from local optimization rules," ArXiV, Tech. Rep. arXiv:1409.7614 [math.DS], September 2014. [Online]. Available: http://arxiv.org/abs/1409.7614

[5] S. Sabato, A. D. Sarwate, and N. Srebro, "Auditing: Active learning with outcome-dependent query costs," ArXiV, Tech. Rep. arXiv:1306.2347 [cs.LG], June 2013. [Online]. Available: http://arxiv.org/abs/1306.2347

Conference Papers

[1] A. Rezaie, J. Gao, and A. Sarwate, "Influencers and the giant component: the fundamental hardness in privacy protection for socially contagious attributes," in *SIAM International Conference on Data Mining*, April 2021. [Online]. Available: https://arxiv.org/abs/2012.11877

[2] M. Ghassemi, Z. Shakeri, W. U. Bajwa, and A. D. Sarwate, "Sample complexity bounds for low-separation-rank dictionary learning," in *Proceedings of the 2019 IEEE International Symposium on Information Theory (ISIT)*, Paris, France, 7–12 July 2019. [Online]. Available: https://dx.doi.org/10.1109/ISIT.2019.8849698

[3] B. K. Dey, S. Jaggi, M. Langberg, A. D. Sarwate, and C. Wang, "The interplay of causality and myopia in adversarial channel models," in *Proceedings of the 2019 IEEE International Symposium on Information Theory (ISIT)*, Paris, France, 7–12 July 2019. [Online]. Available: https://dx.doi.org/10.1109/ISIT.2019.8849568

[4] H. Imtiaz and A. D. Sarwate, "Distributed differentially private canonical correlation analysis," in *Proceedings of the 44th IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Brighton, UK, 12–17 May 2019, pp. 3112–3116. [Online]. Available: https://dx.doi.org/10.1109/ICASSP.2019.8683252

[5] K. Nikolakakis, D. Kalogerias, and A. D. Sarwate, "Learning tree structures from noisy data," in *Proceedings of the Twenty-Second International Conference on Artificial Intelligence and Statistics (AISTATS)*, ser. Proceedings of Machine Learning Research, K. Chaudhuri and R. Salakhutdinov, Eds. Naha, Okinawa, Japan: PMLR, 16–18 April 2019, vol. 89, pp. 1771–1782. [Online]. Available: http://proceedings.mlr.press/v89/nikolakakis19a.html

[6] D. Bittner, A. D. Sarwate, and R. Wright, "Using noisy binary search for differentially private anomaly detection," in *Proceedings of the 2nd International Symposium on Cyber Security Cryptography and Machine Learning (CSCML)*, ser. Lecture Notes in Computer Science, I. Dinur, S. Dolev, and S. Lodha, Eds. Springer, June 2018, vol. 10879, pp. 20–37. [Online]. Available: https://dx.doi.org/10.1007/978-3-319-94147-9_3

[7] G. R. Kurri, V. M. Prabhakaran, and A. D. Sarwate, "Coordination using individually shared randomness," in *Proceedings of the 2018 IEEE International Symposium on Information Theory (ISIT)*, Vail, Colorado, USA, 17–22 June 2018, pp. 2550–2554. [Online]. Available: https://dx.doi.org/10.1109/ISIT.2018.8437316

[8] T. Li, B. K. Dey, S. Jaggi, M. Langberg, and A. D. Sarwate, "Quadratically constrained channels with causal adversaries," in *Proceedings of the 2018 IEEE International Symposium on Information Theory (ISIT)*, Vail, Colorado, USA, 17–22 June 2018, pp. 621–625. [Online]. Available: https://dx.doi.org/10.1109/ISIT.2018.8437839

[9] Y. Zhang, S. Vatedka, S. Jaggi, and A. D. Sarwate, "Quadratically constrained myopic adversarial channels," in *Proceedings of the 2018 IEEE International Symposium on Information Theory (ISIT)*, Vail, Colorado, USA, 17–22 June 2018, pp. 611–615. [Online]. Available: https://dx.doi.org/10.1109/ISIT.2018.8437457

[10] H. Imtiaz and A. D. Sarwate, "Improved algorithms for differentially private orthogonal tensor decomposition," in *Proceedings of the 43rd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Calgary, AB, Canada, 15–20 April 2018, pp. 2201–2205. [Online]. Available: https://dx.doi.org/10.1109/ICASSP.2018.8461303

[11] M. Ghassemi, N. Goela, and A. D. Sarwate, "Global optimality in inductive matrix completion," in *Proceedings of the 43rd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Calgary, AB, Canada, 15–20 April 2018, pp. 2226–2230. [Online]. Available: https://dx.doi.org/10.1109/ICASSP.2018.8462250

[12] S. Xiong, A. D. Sarwate, and N. B. Mandayam, "Defending against packet-size side-channel attacks in IoT networks," in *Proceedings of the 43rd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Calgary, AB, Canada, 15–20 April 2018, pp. 2027–2031. [Online]. Available: https://dx.doi.org/10.1109/ICASSP.2018.8461330

[13] H. Imtiaz and A. D. Sarwate, "Differentially private distributed principal component analysis," in *Proceedings of the 43rd IEEE International Conference on Acoustics, Speech and Signal Processing*

(ICASSP), Calgary, AB, Canada, 15–20 April 2018, pp. 2206–2210. [Online]. Available: https://dx.doi.org/10.1109/ICASSP.2018.8462519

[14] Z. Shakeri, A. D. Sarwate, and W. U. Bajwa, "Identification of Kronecker-structured dictionaries: An asymptotic analysis," in *Proceedings of the 7th IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Curaçao, Netherlands Antilles, 10–13 December 2017, pp. 1–5. [Online]. Available: http://dx.doi.org/10.1109/CAMSAP.2017.8313163

[15] M. Ghassemi, Z. Shakeri, A. D. Sarwate, and W. U. Bajwa, "STARK: Structured dictionary learning through rank-one tensor recovery," in *Proceedings of the 7th IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Curaçao, Netherlands Antilles, 10–13 December 2017, pp. 1–5. [Online]. Available: http://dx.doi.org/10.1109/CAMSAP.2017.8313164

[16] H. Imtiaz and A. D. Sarwate, "Differentially private canonical correlation analysis," in *Proceedings of the 2017 IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Montreal, QC, Canada, 14–16 November 2017, pp. 283 –287. [Online]. Available: http://dx.doi.org/10.1109/GlobalSIP.2017.8308649

[17] B. Liu, C. Wen, A. D. Sarwate, and M. M. Dehnavi, "A unified optimization approach for sparse tensor operations on GPUs," in *Proceedings of the 2017 IEEE International Conference on Cluster Computing (CLUSTER)*, Honolulu, HI, USA, 5–8 September 2017, pp. 47–57. [Online]. Available: http://dx.doi.org/10.1109/CLUSTER.2017.75

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Tutorials

12/17	*Differentially Private Machine Learning: Theory, Algorithms, and Applications* (with K. Chaudhuri), tutorial at the 2017 Neural Information Processing Systems (NIPS).
12/14	*Differential privacy and machine learning* (with K. Chaudhuri), tutorial at the 2014 IEEE Workshop on Information Forensics and Security (WIFS)

Invited Conferences

12/19	H. Imtiaz, J. Mohammadi, A.D. Sarwate, Correlation-Assisted Distributed Differentially Private Estimation, invited poster, NeurIPS 2019 Workshop on Privacy in Machine Learning (PriML '19), Vancouver, Canada
6/19	Differentially Private Learning for Collaborative Research Systems, invited talk, Machine Learning in Science and Engineering (MLSE), Atlanta, GA, USA

2/19 Coordination from Alon using individually shared randomness, invited talk, Probability, Randomness, Estimation: Information Theory and its Alonizations, San Diego, CA, USA

2/19 Learning Mixture of Separable Dictionaries for Tensor Data, invited talk, Information Theory and its Applications Workshop (ITA), San Diego, CA, USA

11/18 Differential privacy as an enabler for collaborative research, invited talk, The Wright Stuff Workshop, New Brunswick, NJ, USA

10/18 Learning latent structures under differential privacy, invited talk, American Mathematical Society (AMS) Fall Central Sectional Meeting, Ann Arbor, MI, USA

5/18 invited participant, Mathematical Foundations of Data Privacy, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Banff, Canada

2/18 Jana: Private Data as a Service, invited talk, Differential Privacy Meets Multi-Party Computation (DPMPC) Workshop, Boston, MA, USA

2/18 Learning structured dictionaries for multidimensional data, invited talk, Information Theory and its Applications Workshop (ITA), San Diego, CA, USA

2/18 Differential Privacy and Collaborative Learning, invited talk, Bar-Ilan University Cyber Center Workshop on "Hacking Deep Learning", Tel Aviv, Israel

8/17 Consensus and Distributed Inference Rates Using Network Divergence, invited talk, DIMACS Workshop on Distributed Optimization, Information Processing, and Learning, New Brunswick, NJ, USA

5/17 Challenges in Privacy-Preserving Learning for Collaborative Research Consortia, invited talk, Data Privacy: Planning Workshop, Simons Institute for Theoretical Computer Science, Berkeley, CA, USA

4/17 Privacy Protections as an Incentive for Collaborative Research on Human Health, DIMACS/Northeast Big Data Hub Workshop on Privacy and Security for Big Data, Piscataway, NJ, USA

11/16 Privacy technologies for data collection, processing, and inference in distributed sensing systems, invited talk, RIEC International Symposium Dependable Wireless Workshop 2016, Tohoku, Japan

9/16 Privacy-enabled collaborative neuroscience research systems, invited poster, Google Learning, Privacy, and Mobile Data Workshop, Seattle, WA, USA

2/16 Algorithms for learning from distributed private data, invited talk, Information Theory and its Applications Workshop (ITA), San Diego, CA, USA

9/15 Differential privacy, approximation, and learning, invited talk, Mathematical Tools of Information-Theoretic Security Workshop, Huawei Mathematical and Algorithmic Sciences Lab, Paris, France

8/15 An Empirical Comparison of Algorithms for Differentially Private Principal Component Analysis, invited poster, 4th Biannual Duke University Workshop on Sensing and Analysis of High-Dimensional Data, Durham, NC, USA

5/15	The role of differential privacy in collaborative healthcare research, invited talk, Big Data Analytics for Health Care: Differential Privacy, Newark, DE, USA
3/15	Myopic Channels, invited talk, Between Shannon and Hamming: Network Information Theory and Combinatorics, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Banff, Canada
2/15	Learning distributions and hypothesis testing via social learning, invited talk, 2015 Bellairs Workshop on Large-Scale Inference and Optimization, Bellairs Research Institute, Holetown, Barbados
2/15	Learning from decentralized private data with applications to neuroimaging, invited talk, Information Theory and its Applications Workshop (ITA), San Diego, CA, USA
11/14	Poisson, Dirichlet, and Redundancy in Estimation Over Large Alphabets, invited talk, DIMACS Mixer 2014, Piscataway, NJ, USA
2/14	MAP perturbations and measure concentration, invited talk, Information Theory and its Applications Workshop (ITA), San Diego, CA, USA
12/13	Differential Privacy and Stochastic Gradient Descent, invited talk, Simons Institute for Theoretical Computer Science Workshop on Big Data and Differential Privacy, Berkeley, CA, USA
2/13	Differential Privacy in Machine Learning and Signal Processing, invited talk, 2013 Bellairs Workshop on Signal Processing and Networks, Bellairs Research Institute, Holetown, Barbados
10/12	Near-Optimal Algorithms for Differentially-Private Principal Components, invited talk, DIMACS Workshop on Recent Work on Differential Privacy across Computer Science, Piscataway, NJ, USA
9/12	invited participant, iDASH Biomedical Data Sharing Ethical, Legal and Policy Perspectives, San Diego, CA, USA
6/12	invited participant, Electronic Data Methods (EDM) Forum Symposium Building an Electronic Clinical Data Infrastructure to Improve Patient Outcomes, Lake Buena Vista, FL, USA
2/12	Mixing times, Markov chains, and some applications to consensus, invited talk, 2012 Bellairs Workshop on Signal Processing and Networks, Bellairs Research Institute, Holetown, Barbados
10/11	invited participant, Information theory and statistics for large alphabets, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Banff, Canada
5/10	Discrete consensus in wireless networks, invited talk, 2010 IEEE Communication Theory Workshop, Cancún, Mexico
8/09	invited participant, Workshop on Permanents and modeling probability distributions, American Institute of Mathematics, San Jose, CA, USA

Recent Talks

5/19	Between Shannon and Hamming: the impact of delay, invited talk, University of California, Berkeley, Berkeley, CA, USA
9/18	Using differential privacy with decentralized data, invited talk, Rutgers University Computer Science Department Colloquium, Piscataway, NJ, USA
7/17	Between Shannon and Hamming: The Impact of Delay, invited talk, École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland
7/17	Between Shannon and Hamming: the impact of delay, invited talk, Technical University of Vienna, Vienna, Austria
12/16	Delay and the gap between the worst and average cases in communication, invited talk, National University of Singapore, Singapore
12/16	Using differential privacy in distributed settings, invited talk, National University of Singapore, Singapore
9/16	MAP Perturbations, invited talk, Memorial Sloan Kettering Cancer Center, New York, NY, USA
7/16	Towards practical differentially private learning algorithms, invited talk, Trinity College, Dublin, Ireland
5/16	From local to distributed differential privacy, invited talk, CUNY Graduate Center, New York, NY, USA
4/15	Differential privacy in distributed systems, invited talk, Harvard University, Cambridge, MA, USA
4/15	From Local to Distributed Differential Privacy, invited talk (webinar), Shannon Channel, https://www.youtube.com/watch?v=juOHywWPY1Y
10/15	Learning from Distributed Private Data: Algorithms and Application, invited talk, University of Michigan, Ann Arbor, MI, USA
7/15	Learning distributions and hypothesis testing via social learning, invited talk, Bell Laboratories, Murray Hill, NJ, USA
6/15	Learning From Distributed Private Data: Algorithms and Applications, invited talk, National Chiao Tung University (NCTU), Hsinchu, Taiwan
5/15	Statistical algorithms and differential privacy, invited talk, AT&T Research, Bedminster, NJ, USA
4/15	Algorithms for differentially private learning, invited talk, Rutgers University Department of Statistics, Piscataway, NJ, USA
4/15	Learning From Distributed Private Data: Algorithms and Applications, invited talk, New York University, New York, NY, USA
4/15	Learning distributions and hypothesis testing via social learning, invited talk, University of Michigan, Ann Arbor, MI, USA

9/14	Active Learning with Asymmetric Costs, invited talk, Rutgers University Department of Statistics, Piscataway, NJ USA
4/14	Enabling collaborative research with privacy-preserving machine learning, invited talk, Mind Research Network, Albuquerque, NM, USA
4/14	Algorithms for privacy-preserving machine learning, invited talk, New York University, New York, NY, USA
4/14	Privacy-sensitive learning for medical data sharing, invited talk, Boston University, Boston, MA, USA
11/13	Active Learning with Outcome-Dependent Query Costs, invited talk, University of Illinois at Urbana-Champaign, Champaign-Urbana, IL, USA
10/13	Privacy-preserving algorithms for signal processing and machine learning, invited talk, École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland
10/13	Privacy-preserving algorithms for signal processing and machine learning, invited talk, Tata Institute of Fundamental Research, Colaba, India
10/13	Privacy-preserving algorithms for signal processing and machine learning, invited talk, Indian Institute of Technology¬ Bombay, Mumbai, India
10/13	Privacy-preserving algorithms for signal processing and machine learning, invited talk, Indian Institute of Technology¬ Madras, Chennai, India
6/13	Coding against adversaries: between oblivious and omniscient, invited talk, Tokyo Institute of Technology, Tokyo, Japan
3/13	Learning from private data, invited talk, Rutgers University, Piscataway, NJ, USA
2/13	Algorithms for privacy-preserving machine learning, invited talk, University of California, Los Angeles, Los Angeles, CA, USA
11/12	Algorithms for privacy-preserving machine learning, invited talk, Texas A&M University, College Station, TX, USA
11/12	Algorithms for privacy-preserving machine learning, invited talk, University of Texas at Austin, Austin, TX, USA
11/12	Algorithms for privacy-preserving machine learning, invited talk, University of Southern California, Los Angeles, CA, USA
11/12	Algorithms for privacy-preserving machine learning, invited talk, Rice University, Houston, TX, USA
11/12	Algorithms for privacy-preserving machine learning, invited talk, University of Wisconsin, Madison, Madison, WI, USA
4/12	Learning the shape of private data, invited talk, Northwestern University, Evanston, IL, USA
1/12	Engineering perspectives on data sharing and privacy, invited talk (webinar), iDASH Center, University of California, San Diego, San Diego, CA, USA

4/11	Gathering, synthesizing, and learning from private information, invited talk, University of Illinois at Chicago, Chicago, IL, USA
4/11	Gathering, synthesizing, and learning from private information, invited talk, University of Florida, Gainesville, FL, USA
3/11	Gathering, synthesizing, and learning from private information, invited talk, Toyota Technological Institute at Chicago, Chicago, IL, USA
3/11	Gathering, synthesizing, and learning from private information, invited talk, Oregon State University, Corvallis, OR, USA
3/11	Gathering, synthesizing, and learning from private information, invited talk, University of Maryland College Park, College Park, MD, USA
2/11	Gathering, synthesizing, and learning from private information, invited talk, University of Minnesota, Minnesota, MN, USA
1/11	Learning from sensitive data: balancing accuracy and privacy, invited talk, Boston University, Boston, MA, USA
9/10	Asymptotics, asynchrony, and asymmetry in distributed consensus, invited talk, Telecom ParisTech (ENST), Paris, France
4/10	Privacy in Informatics: Are We There Yet?, invited talk, Division of Biomedical Informatics, University of California, San Diego, San Diego, CA, USA
3/10	Inference, learning, and optimization under privacy constraints, invited talk, University of Southern California, Los Angeles, CA, USA
10/09	Consensus in context: leveraging the network to accelerate distributed consensus, invited talk, University of Texas at Austin, Austin, TX, USA
9/09	The impact of networking on distributed consensus, invited talk, University of California, Davis, Davis, CA, USA
7/09	Distributed signal processing in networks using gossip, invited talk, University of Washington, Seattle, WA, USA
3/09	Distributed signal processing in networks using gossip, invited talk, Chinese University of Hong Kong, New Territories, Hong Kong
5/08	Robust and adaptive coding strategies for uncertain environments, invited talk, Massachusetts Institute of Technology, Cambridge, MA, USA
4/08	Robust architectures for next generation communication systems, invited talk, University of California, San Diego, San Diego, CA, USA
3/08	Robust architectures for next generation communication systems, invited talk, University of California, Riverside, Riverside, CA, USA
3/08	Robust and adaptive coding strategies for uncertain environments, invited talk, Rutgers University, New Brunswick, NJ, USA
3/08	Robust and adaptive coding strategies for uncertain environments, invited talk, Cornell University, Ithaca, NY, USA

6/06	Fooling the middleman : randomized coding against malicious adversaries, invited talk, University of Wisconsin, Madison, Madison, WI, USA

Professional Memberships

2018–ongoing	Member, American Mathematical Society (AMS)
2014–ongoing	Senior Member, Institute of Electrical and Electronics Engineers (IEEE)

Editorships

1/20–	Consulting Associate Editor, IEEE Open Journal of Signal Processing (OJSP)
1/15–12/18	: Associate Editor, IEEE Transactions on Signal and Information Processing over Networks

Professional Service

2017–2022	Member, Machine Learning for Signal Processing Technical Committee, IEEE Signal Processing Society
1/15–1/19	Online Editor, IEEE Information Theory Society
01/14–12/14	Online Associate Editor, IEEE Information Theory Society
10/08¬–12/10	Member, Student Committee, IEEE Information Theory Society
2007–2009	Member, Ad Hoc Committee on Online Content and Services, IEEE Information Theory Society

Conference and Workshop Organization

2019	Technical Program Chair, 2019 North American School of Information Theory (NASIT 2019), Boston, MA
2019	Chair, Simons Center Workshop on Privacy and the Science of Data Analysis, Simons Institute for Theoretical Computer Science, Berkeley, CA
2018	Co–Organizer, Algorithmic Challenges for Protecting Privacy for Biomedical Data, Institute for Pure and Applied Mathematics (IPAM), Los Angeles, CA
2016	Co–Organizer, Program on the Nexus of Information and Computation Theories: Secrecy and Privacy, Institute Henri Poncaré, Paris, France
2013	Program Committee Member, Information Theory and its Applications Workshop (ITA)
2012	Program Committee Member, Information Theory and its Applications Workshop (ITA)
2011	Program Committee Member, Information Theory and its Applications Workshop (ITA)
2010	Program Committee Member, Information Theory and its Applications Workshop (ITA)

2009 Program Committee Member, Information Theory and its Applications Workshop (ITA)

Program Committees

2020 Technical Program Committee, ICLR 2020 Workshop on Trustworthy ML

2020 Senior Area Chair, Conference on Learning Theory (COLT 2020)

2020 Technical Program Committee, 2020 IEEE International Symposium on Information Theory (ISIT 2020)

2019 Technical Program Committee, NeurIPS 2019 Workshop on Privacy in Machine Learning (PriML 2019)

2019 Technical Program Committee, IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2019)

2019 Area Chair, Neural Information Processing Systems (NeurIPS 2019)

2019 Technical Program Committee, 2019 IEEE International Symposium on Information Theory (ISIT 2019)

2019 Area Chair, International Conference on Machine Learning (ICML 2019)

2019 Technical Program Committee, Workshop on the Theory and Practice of Differential Privacy (TPDP 2018)

2018 Technical Program Committee NIPS Workshop on Privacy Preserving Machine Learning, 2018

2018 Technical Program Committee, IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2018)

2018 Technical Program Committee, 26th European Signal Processing Conference (EUSIPCO 2018)

2018 Technical Program Committee, 19th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC 2018)

2018 Technical Program Committee, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2018)

2018 Technical Program Committee, 2018 IEEE International Symposium on Information Theory (ISIT 2018)

2017 Technical Program Committee, IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2017)

2017 Technical Program Committee, IEEE Global Conference on Signal and Information Processing (GlobalSIP 2017) and Symposium on Control and Information Theoretic Approaches to Privacy and Security

2017 Technical Program Committee, 2017 IEEE Information Theory Workshop (ITW 2017)

2017 Technical Program Committee, 2017 IEEE International Symposium on Information Theory (ISIT 2017)

2016 Technical Program Committee, 13th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt 2015)

2015 Technical Program Committee, 2015 IEEE Global Conference on Signal and Information Processing, General Symposium (GlobalSIP 2015)

2015 Technical Program Committee, IEEE Information Theory Workshop (ITW 2015)

2015 Technical Program Committee , International Conference on Distributed Computing in Sensor Systems (DCOSS 2015)

2014 Technical Program Committee , International Conference on Distributed Computing in Sensor Systems (DCOSS 2014)

2013 Technical Program Committee , International Conference on Distributed Computing in Sensor Systems (DCOSS 2013)

2012 Technical Program Committee, Sixth International Conference on Information–Theoretic Security (ICITS 2012)

2012 Technical Program Committee , International Conference on Distributed Computing in Sensor Systems (DCOSS 2012)

2011 Technical Program Committee, IEEE Vehicular Technology Conference (VTC 2011)

2011 Technical Program Committee, 2011 IEEE International Conference on Communications, Wireless Communications Symposium (ICC 2011)

2010 Technical Program Committee, 2010 IEEE International Conference on Communications, Wireless Communications Symposium (ICC 2010)

Peer Reviewing

Since May 2011, 68 journal manuscripts, 197 conference manuscripts reviewed, and 48 workshop papers reviewed

IEEE Transactions : Information Theory, Signal Processing, Automatic Control, Communications, Wireless Communications, Vehicular Technology, Computational Biology and Bioinformatics, Parallel and Distributed Systems, Smart Grid, Network Science and Engineering, Signal and Information Processing over Networks, Dependable and Secure Computing

IEEE Journal of Selected Areas in Communication, IEEE Journal of Selected Topics in Signal Processing, IEEE Signal Processing Magazine, IEEE Signal Processing Letters, IEEE Communications Letters

Journal of Machine Learning Research (JMLR), Machine Learning

Journal of the American Statistical Association (JASA), Statistical Science

Journal of Privacy and Confidentiality

Bernoulli, Random Structures and Algorithms, Queueing Systems : Theory and Applications

Problems of Information Transmission, Entropy

IEEE/ACM Transactions on Networks, ACM Transactions on Sensor Networks, EURASIP Journal on Wireless Communications and Networking

SIAM Journal on Matrix Analysis and Applications (SIMAX)

AMS Mathematical Reviews

Conferences : ICLR Workshop on Trustworthy ML (2020) ACM Richard Tapia Celebration of Diversity in Computing Poster Track (2019), ISIT (2007–2020), ITW (2008,2010,2013–2019), Globecom (2007, 2009), PIMRC (2007), ICC (2012), WiOpt (2015), ICASSP (2017–2020), GlobalSIP (2015–2017), MLSP (2017–2019), SPAWC (2018), EUSIPCO (2018), DCOSS (2015), CAMSAP (2017), AISTATS (2012, 2013, 2017–2019), NIPS (2012–2016), ICML (2012–2016), COLT (2011, 2012, 2020), STOC (2010), SODA (2015), CDC (2009,2012), ACC (2013), Infocom (2012)

University Service

2018–2019	Advisory Committee to DIMACS Director Search Committee
2016–Present	Health and Safety Committee, School of Engineering (Chair)
2015–2016	Strategic Planning Committee for Douglass Residential College, Rutgers

May 18, 2021