

Anand D. Sarwate

Curriculum Vitæ

CONTACT INFORMATION

Associate Professor

Department of Electrical and Computer Engineering

Rutgers, The State University of New Jersey

94 Brett Road

Piscataway, NJ 08854

Voice: +1.848.445.8516

Email: anand.sarwate@rutgers.edu

Web: <http://adsarwate.github.io/>

RESEARCH INTERESTS

I am broadly interested in probability, statistics, and algorithms 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)
Minor in Music
Minor in 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

IEEE Information Theory Society Distinguished Lecturer, 2024–2025
Outstanding Engineering Professor, Rutgers School of Engineering, 2023
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)

PREPRINTS

- [1] A. Engel, Z. Wang, A. D. Sarwate, S. Choudhury, and T. Chiang. *TorchNTK: A Library for Calculation of Neural Tangent Kernels of PyTorch Models*. Tech. rep. arXiv:2205.12372 [cs.LG]. ArXiv, May 2022. URL: <https://arxiv.org/abs/2205.12372>.
- [2] N. Sathyavageeswaran, R. D. Yates, A. D. Sarwate, and N. Mandayam. “Privacy Leakage in Discrete Time Updating Systems”. May 2022. URL: <https://arxiv.org/abs/2205.15630>.
- [3] Y. Zhang, S. Jaggi, M. Langberg, and A. D. Sarwate. “The Capacity of Causal Adversarial Channels”. May 2022. URL: <https://arxiv.org/abs/2205.06708>.
- [4] K. E. Nikolakakis, D. S. Kalogerias, and A. D. Sarwate. *Optimal Rates for Learning Hidden Tree Structures*. Tech. rep. arXiv:1909.09596v4 [stat.ML]. ArXiv, Mar. 2021. URL: <https://arxiv.org/abs/1909.09596>.
- [5] A. Chatterjee, A. D. Sarwate, and S. Vishwanath. “Generalized Opinion Dynamics from Local Optimization Rules”. Sept. 2014. URL: <http://arxiv.org/abs/1409.7614>.
- [6] A. D. Sarwate and M. Gastpar. *Relaxing the Gaussian AVC*. Tech. rep. arXiv:1204.2587v1 [cs.IT]. Under revision. ArXiv, Sept. 2012. URL: <http://arxiv.org/abs/1209.2755>.

JOURNAL AND ARCHIVAL CONFERENCE

- [1] S. Costanza-Chock, K. R. (editor), K. Henne, S. Mhlambi, and A. Sarwate. “Critical AI and Design Justice: An Interview with Sasha Costanza-Chock”. In: *Critical AI* 1.1 (Oct. 2023). doi: [10.1215/2834703X-10734036](https://doi.org/10.1215/2834703X-10734036).
- [2] B. Taki, A. D. Sarwate, and W. U. Bajwa. “Structured Low-Rank Tensor Models for Logistic Regression”. In: *Transactions on Machine Learning Research* (Aug. 2023). URL: <https://openreview.net/forum?id=qUxBs3Ln41>.

- [3] D. Martin, S. Basodi, S. Panta, K. Rootes-Murdy, P. Prae, A. D. Sarwate, R. Kelly, J. Romero, B. T. Baker, H. Gazula, J. Bockholt, J. A. Turner, N. B. Esper, A. R. Franco, S. Plis, and V. D. Calhoun. “Enhancing collaborative neuroimaging research: introducing COINSTAC Vaults for federated analysis and reproducibility”. In: *Frontiers in Neuroinformatics* 17 (June 2023). DOI: [10.3389/fninf.2023.1207721](https://doi.org/10.3389/fninf.2023.1207721).
- [4] N. Tasnim, J. Mohammadi, A. D. Sarwate, and H. Imtiaz. “Approximating Functions with Approximate Privacy for Applications in Signal Estimation and Learning”. In: *Entropy* 25.5 (May 2023), p. 825. DOI: [10.3390/e25050825](https://doi.org/10.3390/e25050825).
- [5] H. Gazula, K. Rootes-Murdy, B. Holla, S. Basodi, Z. Zhang, E. Verner, R. Kelly, P. Murthy, A. Chakrabarti, D. Basu, S. Bhagyalakshmi Nanjayya, R. Lenin Singh, R. Lourembam Singh, K. Kalyanram, K. Kartik, K. Kalyanaraman, K. Ghattu, R. Kuriyan, S. S. Kurpad, G. J. Barker, R. D. Bharath, S. Desrivieres, M. Purushottam, D. P. Orfanos, E. Sharma, M. Hickman, M. Toledano, N. Vaidya, T. Banaschewski, A. L. W. Bokde, H. Flor, A. Grigis, H. Garavan, P. Gowland, A. Heinz, R. Brühl, J.-L. Martinot, M.-L. Paillère Martinot, E. Artiges, F. Nees, T. Paus, L. Poustka, J. H. Fröhner, L. Robinson, M. N. Smolka, H. Walter, J. Winterer, R. Whelan, J. A. Turner, A. D. Sarwate, S. M. Plis, V. Benegal, G. Schumann, V. D. Calhoun, and IMAGEN Consortium. “Federated Analysis in COINSTAC Reveals Functional Network Connectivity and Spectral Links to Smoking and Alcohol Consumption in Nearly 2,000 Adolescent Brains”. In: *Neuroinformatics* 21 (Apr. 2023), pp. 287–301. DOI: [10.1007/s12021-022-09604-4](https://doi.org/10.1007/s12021-022-09604-4).
- [6] R. Islam, K. N. Keya, S. Pan, A. D. Sarwate, and J. R. Foulds. “Differential Fairness: An Intersectional Framework for Fair AI”. In: *Entropy* 25.4 (Apr. 2023). ISSN: 1099-4300. DOI: [10.3390/e25040660](https://doi.org/10.3390/e25040660).
- [7] Y. Zhang, S. Vatedka, S. Jaggi, and A. D. Sarwate. “Quadratically Constrained Myopic Adversarial Channels”. In: *IEEE Transactions on Information Theory* 68 (Aug. 2022), pp. 4901–4948. DOI: [10.1109/TIT.2022.3167554](https://doi.org/10.1109/TIT.2022.3167554).
- [8] S. Xiong, A. D. Sarwate, and N. B. Mandayam. “Network Traffic Shaping for Enhancing Privacy in IoT Systems”. In: *IEEE/ACM Transactions on Networking* 30.3 (June 2022), pp. 1162–1177. DOI: [10.1109/TNET.2021.3140174](https://doi.org/10.1109/TNET.2021.3140174).
- [9] K. Rootes-Murdy, H. Gazula, E. Verner, R. Kelly, T. DeRamus, S. Plis, A. Sarwate, J. Turner, and V. Calhoun. “Federated Analysis of Neuroimaging Data: A Review of the Field”. In: *Neuroinformatics* 20.2 (Apr. 2022), pp. 377–390. DOI: [10.1007/s12021-021-09550-7](https://doi.org/10.1007/s12021-021-09550-7).
- [10] D. K. Saha, V. D. Calhoun, Y. Du, Z. Fu, S. M. Kwon, A. D. Sarwate, S. R. Panta, and S. M. Plis. “Privacy-preserving quality control of neuroimaging datasets in federated environments”. In: *Human Brain Mapping* 43 (Mar. 2022), pp. 2289–2310. DOI: [10.1002/hbm.25788](https://doi.org/10.1002/hbm.25788).
- [11] H. Imtiaz, J. Mohammadi, R. Silva, B. Baker, S. M. Plis, A. D. Sarwate, and V. D. Calhoun. “A Correlated Noise-Assisted Decentralized Differentially Private Estimation Protocol, and its Application to fMRI Source Separation”. In: *IEEE Transactions on Signal Processing* 69 (Nov. 2021), pp. 6355–6370. DOI: [10.1109/TSP.2021.3126546](https://doi.org/10.1109/TSP.2021.3126546).
- [12] G. R. Kurri, V. M. Prabhakaran, and A. D. Sarwate. “Coordination Through Shared Randomness”. In: *IEEE Transactions on Information Theory* 67.8 (Aug. 2021), pp. 4948–4974. DOI: [10.1109/TIT.2021.3091604](https://doi.org/10.1109/TIT.2021.3091604).
- [13] K. E. Nikolakakis, D. S. Kalogieras, A. D. Sarwate, and O. Sheffet. “Quantile Multi-Armed Bandits: Optimal Best-Arm Identification and a Differentially Private Scheme”. In: *IEEE Journal on Selected Areas in Information Theory* 2.2 (June 2021), pp. 534–548. DOI: [10.1109/JSAIT.2021.3081525](https://doi.org/10.1109/JSAIT.2021.3081525).

- [14] K. E. Nikolakakis, D. S. Kalogierias, and A. D. Sarwate. “Predictive Learning on Hidden Tree-Structured Ising Models”. In: *Journal of Machine Learning Research* 22.59 (Apr. 2021), pp. 1–82. URL: <https://jmlr.org/papers/v22/19-149.html>.
- [15] H. Gazula, B. Holla, Z. Zhang, J. Xu, E. Verner, R. Kelly, S. Jain, R. D. Bharath, G. J. Barker, D. Basu, A. Chakrabarti, K. Kalyanram, K. Kumaran, L. Singh, R. Kuriyan, P. Murthy, V. Benega, S. M. Plis, A. D. Sarwate, J. A. Turner, G. Schumann, and V. D. Calhoun. “Decentralized Multisite VBM Analysis During Adolescence Shows Structural Changes Linked to Age, Body Mass Index, and Smoking: a COINSTAC Analysis”. In: *Neuroinformatics* (Jan. 2021). DOI: [10.1007/s12021-020-09502-7](https://doi.org/10.1007/s12021-020-09502-7).
- [16] H. Gazula, R. Kelly, J. Romero, E. Verner, B. T. Baker, R. F. Silva, H. Imtiaz, D. K. Saha, R. Raja, J. A. Turner, A. D. Sarwate, S. M. Plis, and V. D. Calhoun. “COINSTAC: Collaborative Informatics and Neuroimaging Suite Toolkit for Anonymous Computation”. In: *Journal of Open Source Software* 5.54 (Oct. 2020), p. 2166. DOI: [10.21105/joss.02166](https://doi.org/10.21105/joss.02166).
- [17] 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”. In: *Journal of Privacy and Confidentiality* 10.2 (June 2020). DOI: [10.29012/jpc.720](https://doi.org/10.29012/jpc.720).
- [18] M. Ghassemi, Z. Shakeri, A. D. Sarwate, and W. U. Bajwa. “Learning Mixtures of Separable Dictionaries for Tensor Data: Analysis and Algorithms”. In: *IEEE Transactions on Signal Processing* 68.1 (Jan. 2020), pp. 33–48. DOI: [10.1109/TSP.2019.2952046](https://doi.org/10.1109/TSP.2019.2952046).
- [19] T. Hazan, F. Orabona, A. D. Sarwate, S. Maji, and T. Jaakkola. “High Dimensional Inference with Random Maximum A-Posteriori Perturbations”. In: *IEEE Transactions on Information Theory* 65.10 (Oct. 2019), pp. 6539–6560. DOI: [10.1109/TIT.2019.2916805](https://doi.org/10.1109/TIT.2019.2916805).
- [20] 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”. In: *NeuroImage* 186 (Feb. 2019), pp. 557–569. DOI: [10.1016/j.neuroimage.2018.10.072](https://doi.org/10.1016/j.neuroimage.2018.10.072).
- [21] H. Imtiaz and A. D. Sarwate. “Distributed Differentially-Private Algorithms for Matrix and Tensor Factorization”. In: *IEEE Journal of Selected Topics in Signal Processing* 12.6 (Dec. 2018), pp. 1449–1464. DOI: [10.1109/JSTSP.2018.2877842](https://doi.org/10.1109/JSTSP.2018.2877842).
- [22] K. Kalantari, L. Sankar, and A. D. Sarwate. “Robust Privacy-Utility Tradeoffs under Differential Privacy and Hamming Distortion”. In: *IEEE Transactions on Information Forensics and Security* 13.11 (Nov. 2018), pp. 2816–2830. DOI: [10.1109/TIFS.2018.2831619](https://doi.org/10.1109/TIFS.2018.2831619).
- [23] Z. Shakeri, A. D. Sarwate, and W. U. Bajwa. “Identifiability of Kronecker-Structured Dictionaries for Tensor Data”. In: *IEEE Journal of Selected Topics in Signal Processing* 12.5 (Oct. 2018), pp. 1047–1062. DOI: [10.1109/JSTSP.2018.2838092](https://doi.org/10.1109/JSTSP.2018.2838092).
- [24] A. Lalitha, T. Javidi, and A. D. Sarwate. “Social Learning and Distributed Hypothesis Testing”. In: *IEEE Transactions on Information Theory* 64.9 (Sept. 2018), pp. 6161–6179. DOI: [10.1109/TIT.2018.2837050](https://doi.org/10.1109/TIT.2018.2837050).
- [25] Z. Shakeri, W. U. Bajwa, and A. D. Sarwate. “Minimax Lower Bounds on Dictionary Learning for Tensor Data”. In: *IEEE Transactions on Information Theory* 64.4 (Apr. 2018), pp. 2706–2726. DOI: [10.1109/TIT.2018.2799931](https://doi.org/10.1109/TIT.2018.2799931).
- [26] A. Bijral, A. D. Sarwate, and N. Srebro. “Data Dependent Convergence For Consensus Stochastic Optimization”. In: *IEEE Transactions on Automatic Control* 62.9 (Sept. 2017), pp. 4483–4498. DOI: [10.1109/TAC.2017.2671377](https://doi.org/10.1109/TAC.2017.2671377).

- [27] 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”. In: *F1000Research* 6.1512 (Aug. 2017). DOI: [10.12688/f1000research.12353.1](https://doi.org/10.12688/f1000research.12353.1).
- [28] N. D. Goldstein and A. D. Sarwate. “Privacy, security, and the public health researcher in the era of electronic health record research”. In: *Online Journal of Public Health Informatics* 8.3 (Dec. 2016), e207. DOI: [10.5210/ojphi.v8i3.7251](https://doi.org/10.5210/ojphi.v8i3.7251).
- [29] S. Plis, A. D. Sarwate, D. Wood, C. Dieringer, D. Landis, C. Reed, S. R. Panta, J. A. Turner, J. M. Shoemaker, K. W. Carter, P. Thompson, K. Hutchison, and V. D. Calhoun. “COINSTAC: A Privacy Enabled Model and Prototype for Leveraging and Processing Decentralized Brain Imaging Data”. In: *Frontiers in Neuroscience* 10.365 (Aug. 2016). DOI: [10.3389/fnins.2016.00365](https://doi.org/10.3389/fnins.2016.00365).
- [30] C. Huang, L. Sankar, and A. D. Sarwate. “Designing Incentive Schemes For Privacy-Sensitive Users”. In: *Journal of Privacy and Confidentiality* 7.1 (Mar. 2016), pp. 99–127. URL: <http://repository.cmu.edu/jpc/vol7/iss1/5/>.
- [31] A. D. Sarwate and T. Javidi. “Distributed Learning of Distributions via Social Sampling”. In: *IEEE Transactions on Automatic Control* 60.1 (Jan. 2015), pp. 34–45. DOI: [10.1109/TAC.2014.2329611](https://doi.org/10.1109/TAC.2014.2329611).
- [32] N. P. Santhanam, A. D. Sarwate, and J. O. Woo. “Redundancy of Exchangeable Estimators”. In: *Entropy* 16.10 (Oct. 2014), pp. 5339–5357. DOI: [10.3390/e16105339](https://doi.org/10.3390/e16105339).
- [33] A. D. Sarwate, S. M. Plis, J. A. Turner, M. R. Arbabshirani, and V. D. Calhoun. “Sharing privacy-sensitive access to neuroimaging and genetics data: a review and preliminary validation”. In: *Frontiers in Neuroinformatics* 8.35 (Apr. 2014). DOI: [10.3389/fninf.2014.00035](https://doi.org/10.3389/fninf.2014.00035).
- [34] K. Chaudhuri, A. D. Sarwate, and K. Sinha. “A Near-Optimal Algorithm for Differentially-Private Principal Components”. In: *Journal of Machine Learning Research* 14 (Sept. 2013), pp. 2905–2943. URL: <http://jmlr.org/papers/volume14/chaudhuri13a/chaudhuri13a.pdf>.
- [35] A. D. Sarwate and K. Chaudhuri. “Signal processing and machine learning with differential privacy: theory, algorithms, and challenges”. In: *IEEE Signal Processing Magazine* 30.5 (Sept. 2013), pp. 86–94. DOI: [10.1109/MSP.2013.2259911](https://doi.org/10.1109/MSP.2013.2259911).
- [36] X. Jiang, A. D. Sarwate, and L. Ohno-Machado. “Privacy Technology to Share Data for Comparative Effectiveness Research : a systematic review”. In: *Medical Care* 51.8 Suppl. 3 (Aug. 2013), S58–S65. DOI: [10.1097/MLR.0b013e31829b1d10](https://doi.org/10.1097/MLR.0b013e31829b1d10).
- [37] B. K. Dey, S. Jaggi, M. Langberg, and A. D. Sarwate. “Upper Bounds on the Capacity of Binary Channels with Causal Adversaries”. In: *IEEE Transactions on Information Theory* 59.6 (June 2013), pp. 3753–3763. DOI: [10.1109/TIT.2013.2245721](https://doi.org/10.1109/TIT.2013.2245721).
- [38] A. D. Sarwate, S. Checkoway, and H. Shacham. “Risk-Limiting Audits and the Margin of Victory in Nonplurality Elections”. In: *Statistics, Politics and Policy* 3.3 (Dec. 2012), pp. 29–64. DOI: [10.1515/spp-2012-0003](https://doi.org/10.1515/spp-2012-0003).
- [39] S. A. Vinterbo, A. D. Sarwate, and A. Boxwala. “Protecting Count Queries in Study Design”. In: *Journal of the American Medical Informatics Association* 19.5 (Sept. 2012), pp. 750–757. DOI: [10.1136/amiajnl-2011-000459](https://doi.org/10.1136/amiajnl-2011-000459).
- [40] A. D. Sarwate and A. G. Dimakis. “The Impact of Mobility on Gossip Algorithms”. In: *IEEE Transactions on Information Theory* 58.3 (Mar. 2012), pp. 1731–1742. DOI: [10.1109/TIT.2011.2177753](https://doi.org/10.1109/TIT.2011.2177753).

- [41] A. D. Sarwate and M. Gastpar. “List-Decoding for the Arbitrarily Varying Channel Under State Constraints”. In: *IEEE Transactions on Information Theory* 58.3 (Mar. 2012), pp. 1372–1384. DOI: [10.1109/TIT.2011.2178153](https://doi.org/10.1109/TIT.2011.2178153).
- [42] K. Chaudhuri, C. Monteleoni, and A. D. Sarwate. “Differentially private empirical risk minimization”. In: *Journal of Machine Learning Research* 12 (Mar. 2011), pp. 1069–1109. URL: <http://jmlr.csail.mit.edu/papers/v12/chaudhuri11a.html>.
- [43] A. D. Sarwate and M. Gastpar. “A little feedback can simplify sensor network cooperation”. In: *IEEE Journal of Selected Areas in Communication* 28.7 (Sept. 2010), pp. 1159–1168. DOI: [10.1109/JSAC.2010.100920](https://doi.org/10.1109/JSAC.2010.100920).
- [44] A. D. Sarwate and M. Gastpar. “Rateless codes for AVC models”. In: *IEEE Transactions on Information Theory* 56.7 (July 2010), pp. 3105–3114. DOI: [10.1109/TIT.2010.2048497](https://doi.org/10.1109/TIT.2010.2048497).
- [45] K. Eswaran, A. D. Sarwate, A. Sahai, and M. Gastpar. “Zero-rate feedback can achieve the empirical capacity”. In: *IEEE Transactions on Information Theory* 56.1 (Jan. 2010), pp. 25–39. DOI: [10.1109/TIT.2009.2034779](https://doi.org/10.1109/TIT.2009.2034779).
- [46] T. C. Aysal, M. E. Yildiz, A. D. Sarwate, and A. Scaglione. “Broadcast Gossip Algorithms for Consensus”. In: *IEEE Transactions on Signal Processing* 57.7 (July 2009), pp. 2748–2761. DOI: [10.1109/TSP.2009.2016247](https://doi.org/10.1109/TSP.2009.2016247).
- [47] A. G. Dimakis, A. D. Sarwate, and M. J. Wainwright. “Geographic Gossip: Efficient Averaging for Sensor Networks”. In: *IEEE Transactions on Signal Processing* 56.3 (Mar. 2008), pp. 1205–1215. DOI: [10.1109/TSP.2007.908946](https://doi.org/10.1109/TSP.2007.908946).
- [48] A. D. Sarwate and V. Anantharam. “Exact emulation of a priority queue with a switch and delay lines”. In: *Queueing Systems : Theory and Applications* 53.3 (July 2006), pp. 115–125. DOI: [10.1007/s11134-006-6669-x](https://doi.org/10.1007/s11134-006-6669-x).

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*. Ed. by M. Rodrigues and Y. C. Eldar. Cambridge, UK: Cambridge University Press, 2021, pp. 134–162. DOI: [10.1017/9781108616799.006](https://doi.org/10.1017/9781108616799.006).

CONFERENCE PAPERS

- [1] Z. Wang, A. Engel, A. Sarwate, I. Dumitriu, and T. Chiang. “Spectral Evolution and Invariance in Linear-width Neural Networks”. In: *Advances in Neural Information Processing Systems 36 (NeurIPS 2023)*. Curran Associates, Inc., Dec. 2023. URL: <https://openreview.net/forum?id=gpqBGyKeKH>.
- [2] D. K. Saha, V. Calhoun, S. M. Kwon, A. Sarwate, R. Saha, and S. Plis. “Federated, Fast, and Private Visualization of Decentralized Data”. In: *Federated Learning and Analytics in Practice: Algorithms, Systems, Applications, and Opportunities (FL-ICML 2023)*. July 2023. URL: <https://openreview.net/forum?id=XkfbFUqvek>.
- [3] Z. Wang, A. Engel, A. Sarwate, I. Dumitriu, and T. Chiang. “Spectral Evolution and Invariance in Linear-width Neural Networks”. In: *Workshop on High-dimensional Learning Dynamics (HiLD-ICML 2023)*. July 2023. URL: <https://drive.google.com/file/d/1dzzXlayANDzFOFSC6j0gwwOZ-Iweo44C/view>.

- [4] S. Li, P. Krishan, S. Jaggi, M. Langberg, and A. D. Sarwate. “Computationally Efficient Codes for Adversarial Binary-Erasure Channels”. In: *Proceedings of the 2023 IEEE International Symposium on Information Theory (ISIT)*. June 2023, pp. 228–233. DOI: [10.1109/ISIT54713.2023.10206731](https://doi.org/10.1109/ISIT54713.2023.10206731).
- [5] N. Sathyavageeswaran, R. D. Yates, A. D. Sarwate, and N. Mandayam. “Privacy Leakage in Discrete Time Updating Systems”. In: *Proceedings of the 2022 IEEE International Symposium on Information Theory (ISIT)*. June 2022. DOI: [10.1109/ISIT50566.2022.9834673](https://doi.org/10.1109/ISIT50566.2022.9834673).
- [6] Y. Zhang, S. Jaggi, M. Langberg, and A. D. Sarwate. “The Capacity of Causal Adversarial Channels”. In: *Proceedings of the 2022 IEEE International Symposium on Information Theory (ISIT)*. June 2022. DOI: [10.1109/ISIT50566.2022.9834709](https://doi.org/10.1109/ISIT50566.2022.9834709).
- [7] S. M. Kwon, X. Li, and A. D. Sarwate. “Low-Rank Phase Retrieval with Structured Tensor Models”. In: *Proceedings of the 47th IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2022)*. May 2022, pp. 3643–3647. DOI: [10.1109/ICASSP43922.2022.9746452](https://doi.org/10.1109/ICASSP43922.2022.9746452).
- [8] F. Cangialosi, N. Agarwal, V. Arun, J. Jiang, S. Narayana, A. Sarwate, and R. Netravali. “Privid: Practical, Privacy-Preserving Video Analytics Queries”. In: *Proceedings of the 19th USENIX Symposium on Networked Systems Design and Implementation (NSDI ’22)*. Apr. 2022. URL: <https://www.usenix.org/conference/nsdi22/presentation/cangialosi>.
- [9] Y. Tao, A. Chihoub, A. D. Sarwate, S. Panta, and V. Calhoun. “Privacy-Preserving Visualization of Functional Network Connectivity”. In: *International Conference of the IEEE Engineering in Medicine and Biology Society*. Glasgow, Scotland, UK, 2022.
- [10] B. Taki, M. Ghassemi, A. D. Sarwate, and W. U. Bajwa. “A Minimax Lower Bound for Low-Rank Matrix-Variate Logistic Regression”. In: *2021 Asilomar Conference on Signals, Systems, and Computers*. Nov. 2021, pp. 477–484. DOI: [10.1109/IEEECONF53345.2021.9723149](https://doi.org/10.1109/IEEECONF53345.2021.9723149).
- [11] A. Rezaie, J. Gao, and A. D. Sarwate. “Influencers and the Giant Component: the Fundamental Hardness in Privacy Protection for Socially Contagious Attributes”. In: *SIAM International Conference on Data Mining*. Ed. by C. Demeniconi and I. Davidson. Apr. 2021, pp. 217–225. DOI: [10.1137/1.9781611976700.25](https://doi.org/10.1137/1.9781611976700.25).
- [12] A. J. Budkuley, B. K. Dey, S. Jaggi, M. Langberg, A. D. Sarwate, and C. Wang. “Symmetrizability for Myopic AVCs”. In: *Proceedings of the 2020 IEEE International Symposium on Information Theory (ISIT)*. June 2020. DOI: [10.1109/ISIT44484.2020.9174487](https://doi.org/10.1109/ISIT44484.2020.9174487).
- [13] 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, July 2019. DOI: [10.1109/ISIT.2019.8849568](https://doi.org/10.1109/ISIT.2019.8849568).
- [14] 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, July 2019. DOI: [10.1109/ISIT.2019.8849698](https://doi.org/10.1109/ISIT.2019.8849698).
- [15] 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, May 2019, pp. 3112–3116. DOI: [10.1109/ICASSP.2019.8683252](https://doi.org/10.1109/ICASSP.2019.8683252).

- [16] K. Nikolakakis, D. Kalogierias, and A. D. Sarwate. “Learning Tree Structures from Noisy Data”. In: *Proceedings of the Twenty-Second International Conference on Artificial Intelligence and Statistics (AISTATS)*. Ed. by K. Chaudhuri and R. Salakhutdinov. Vol. 89. Proceedings of Machine Learning Research. Naha, Okinawa, Japan: PMLR, Apr. 2019, pp. 1771–1782. URL: <http://proceedings.mlr.press/v89/nikolakakis19a.html>.
- [17] 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)*. Ed. by I. Dinur, S. Dolev, and S. Lodha. Vol. 10879. Lecture Notes in Computer Science. Springer, June 2018, pp. 20–37. DOI: [10.1007/978-3-319-94147-9_3](https://doi.org/10.1007/978-3-319-94147-9_3).
- [18] 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, June 2018, pp. 2550–2554. DOI: [10.1109/ISIT.2018.8437316](https://doi.org/10.1109/ISIT.2018.8437316).
- [19] 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, June 2018, pp. 621–625. DOI: [10.1109/ISIT.2018.8437839](https://doi.org/10.1109/ISIT.2018.8437839).
- [20] 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, June 2018, pp. 611–615. DOI: [10.1109/ISIT.2018.8437457](https://doi.org/10.1109/ISIT.2018.8437457).
- [21] 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, Apr. 2018, pp. 2226–2230. DOI: [10.1109/ICASSP.2018.8462250](https://doi.org/10.1109/ICASSP.2018.8462250).
- [22] 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, Apr. 2018, pp. 2201–2205. DOI: [10.1109/ICASSP.2018.8461303](https://doi.org/10.1109/ICASSP.2018.8461303).
- [23] 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, Apr. 2018, pp. 2206–2210. DOI: [10.1109/ICASSP.2018.8462519](https://doi.org/10.1109/ICASSP.2018.8462519).
- [24] 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, Apr. 2018, pp. 2027–2031. DOI: [10.1109/ICASSP.2018.8461330](https://doi.org/10.1109/ICASSP.2018.8461330).
- [25] 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, Dec. 2017, pp. 1–5. DOI: [10.1109/CAMSAP.2017.8313164](https://doi.org/10.1109/CAMSAP.2017.8313164).
- [26] 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, Dec. 2017, pp. 1–5. DOI: [10.1109/CAMSAP.2017.8313163](https://doi.org/10.1109/CAMSAP.2017.8313163).

- [27] 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, Nov. 2017, pp. 283–287. DOI: [10.1109/GlobalSIP.2017.8308649](https://doi.org/10.1109/GlobalSIP.2017.8308649).
- [28] 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, Sept. 2017, pp. 47–57. DOI: [10.1109/CLUSTER.2017.75](https://doi.org/10.1109/CLUSTER.2017.75).
- [29] Z. Shakeri, W. U. Bajwa, and A. D. Sarwate. “Sample Complexity Bounds for Dictionary Learning of Tensor Data”. In: *Proceedings of the 42nd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. New Orleans, LA, USA, Mar. 2017, pp. 4501–4505. DOI: [10.1109/ICASSP.2017.7953008](https://doi.org/10.1109/ICASSP.2017.7953008).
- [30] N. Wojtalewicz, R. Silva, V. Calhoun, A. Sarwate, and S. Plis. “Decentralized Independent Vector Analysis”. In: *Proceedings of the 42nd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. New Orleans, LA, USA, Mar. 2017, pp. 826–830. DOI: [10.1109/ICASSP.2017.7952271](https://doi.org/10.1109/ICASSP.2017.7952271).
- [31] L. Wei, A. D. Sarwate, J. Corander, A. Hero, and V. Tarokh. “Analysis of a Privacy-preserving PCA Algorithm using Random Matrix Theory”. In: *Proceedings of the 2016 IEEE Global Conference on Signal and Information Processing (GlobalSIP)*. Washington, DC, USA, Dec. 2016, pp. 1335–1339. DOI: [10.1109/GlobalSIP.2016.7906058](https://doi.org/10.1109/GlobalSIP.2016.7906058).
- [32] M. Ghassemi, A. D. Sarwate, and R. Wright. “Differentially Private Online Active Learning with Applications to Anomaly Detection”. In: *Proceedings of the 9th ACM Workshop on Artificial Intelligence and Security (AISec)*. Vienna, Austria, Oct. 2016, pp. 117–128. DOI: [10.1145/2996758.2996766](https://doi.org/10.1145/2996758.2996766).
- [33] A. Bijral, A. D. Sarwate, and N. Srebro. “Data-Dependent Bounds on Network Gradient Descent”. In: *Proceedings of the 54th Annual Allerton Conference on Communication, Control, and Computing*. Monticello, IL, USA, Sept. 2016, pp. 869–874. DOI: [10.1109/ALLERTON.2016.7852325](https://doi.org/10.1109/ALLERTON.2016.7852325).
- [34] B. K. Dey, S. Jaggi, M. Langberg, and A. D. Sarwate. “A bit of delay is sufficient and stochastic encoding is necessary to overcome online adversarial erasures”. In: *Proceedings of the 2016 IEEE International Symposium on Information Theory (ISIT)*. Barcelona, Spain, July 2016, pp. 880–884. DOI: [10.1109/ISIT.2016.7541425](https://doi.org/10.1109/ISIT.2016.7541425).
- [35] K. Kalantari, L. Sankar, and A. D. Sarwate. “Optimal Differential Privacy Mechanisms under Hamming Distortion for Structured Source Classes”. In: *Proceedings of the 2016 IEEE International Symposium on Information Theory (ISIT)*. Barcelona, Spain, July 2016, pp. 2069–2073. DOI: [10.1109/ISIT.2016.7541663](https://doi.org/10.1109/ISIT.2016.7541663).
- [36] Z. Shakeri, W. U. Bajwa, and A. D. Sarwate. “Minimax Lower Bounds for Kronecker-Structured Dictionary Learning”. In: *Proceedings of the 2016 IEEE International Symposium on Information Theory (ISIT)*. Barcelona, Spain, July 2016, pp. 1148–1152. DOI: [10.1109/ISIT.2016.7541479](https://doi.org/10.1109/ISIT.2016.7541479).
- [37] H. Imtiaz and A. D. Sarwate. “Symmetric Matrix Perturbation for Differentially-Private Principal Component Analysis”. Shanghai, China, Mar. 2016. DOI: [10.1109/ICASSP.2016.7472095](https://doi.org/10.1109/ICASSP.2016.7472095).
- [38] H. Imtiaz, R. Silva, B. Baker, S. M. Plis, A. D. Sarwate, and V. D. Calhoun. “Privacy-preserving source separation for distributed data using independent component analysis”. In: *Proceedings of the 2016 Annual Conference on Information Science and Systems (CISS)*. Princeton, NJ, USA, Mar. 2016, pp. 123–127. DOI: [10.1109/CISS.2016.7460488](https://doi.org/10.1109/CISS.2016.7460488).

- [39] L. Xie, S. M. Plis, and A. Sarwate. “Data Weighted Ensemble Learning for Privacy-Preserving Distributed Learning”. In: *Proceedings of the 2006 International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. Shanghai, China, Mar. 2016, pp. 2309–2313. DOI: [10.1109/ICASSP.2016.7472089](https://doi.org/10.1109/ICASSP.2016.7472089).
- [40] S. Xiong, A. D. Sarwate, and N. B. Mandayam. “Randomized Requantization with Local Differential Privacy”. In: *Proceedings of the 2016 International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. Shanghai, China, Mar. 2016, pp. 2189–2193. DOI: [10.1109/ICASSP.2016.7472065](https://doi.org/10.1109/ICASSP.2016.7472065).
- [41] A. Chatterjee, A. D. Sarwate, and S. Vishwanath. “Generalized Opinion Dynamics from Local Optimization Rules”. In: *Proceedings of the 49th Asilomar Conference on Signals, Systems, and Computers*. Pacific Grove, CA, USA, Nov. 2015, pp. 1075–1079. DOI: [10.1109/ACSSC.2015.7421304](https://doi.org/10.1109/ACSSC.2015.7421304).
- [42] C. Huang, L. Sankar, and A. D. Sarwate. “Incentive Schemes For Privacy-Sensitive Consumers”. In: *Decision and Game Theory for Security*. Ed. by M. Khouzani, E. Panaousis, and G. Theodorakopoulos. Lecture Notes in Computer Science 9406. Cham, Switzerland: Springer, Nov. 2015, pp. 358–369. DOI: [10.1007/978-3-319-25594-1_21](https://doi.org/10.1007/978-3-319-25594-1_21).
- [43] B. Baker, R. Silva, V. D. Calhoun, A. D. Sarwate, and S. Plis. “Large scale collaboration with autonomy: decentralized data ICA”. In: *Proceedings of the IEEE International Workshop on Machine Learning For Signal Processing (MLSP)*. Boston, MA, USA, Sept. 2015, pp. 1–6. DOI: [10.1109/MLSP.2015.7324344](https://doi.org/10.1109/MLSP.2015.7324344).
- [44] M. Ghassemi and A. D. Sarwate. “Distributed Proportional Stochastic Coordinate Descent with Social Sampling”. In: *Proceedings of the 53rd Annual Allerton Conference on Communication, Control, and Computing*. Monticello, IL, USA, Sept. 2015, pp. 17–24. DOI: [10.1109/ALLERTON.2015.7446981](https://doi.org/10.1109/ALLERTON.2015.7446981).
- [45] S. Song, K. Chaudhuri, and A. D. Sarwate. “Learning from Data with Heterogeneous Noise using SGD”. In: *Proceedings of the Eighteenth International Conference on Artificial Intelligence and Statistics (AISTATS)*. Ed. by G. Lebanon and S. V. N. Vishwanathan. Vol. 38. Proceedings of Machine Learning Research. San Diego, California, USA: PMLR, May 2015, pp. 894–902. URL: <http://jmlr.org/proceedings/papers/v38/song15.html>.
- [46] T. Wu, A. D. Sarwate, and W. U. Bajwa. “Active dictionary learning for image representation”. In: *Unmanned Systems Technology XVII*. Ed. by R. E. Karlsen, D. W. Gage, C. M. Shoemaker, and G. R. Gerhart. Vol. 9468. Proceedings of SPIE 946809. SPIE, May 2015, pp. 1–10. DOI: [10.1117/12.2180018](https://doi.org/10.1117/12.2180018).
- [47] V. K. Potluru, J. Diaz-Montes, A. D. Sarwate, S. M. Plis, V. D. Calhoun, B. A. Pearlmutter, and M. Parashar. “CometCloudCare (C^3): Distributed Machine Learning Platform-as-a-Service with Privacy Preservation”. In: *NIPS 2014 Workshop on Distributed Machine Learning and Matrix Computations*. Montreal, Canada, Dec. 2014, pp. 1–9. URL: <http://stanford.edu/~rezab/nips2014workshop/submits/privacynmf.pdf>.
- [48] A. D. Sarwate and L. Sankar. “A Rate-Distortion [sic] Perspective on Local Differential Privacy”. In: *Proceedings of the 52nd Annual Allerton Conference on Communication, Control and Computation*. Monticello, IL, USA, Sept. 2014. DOI: [10.1109/ALLERTON.2014.7028550](https://doi.org/10.1109/ALLERTON.2014.7028550).
- [49] K. I. Tsianos, A. D. Sarwate, and M. G. Rabbat. “Tradeoffs For Task Parallelization In Distributed Optimization”. In: *Proceedings of the IEEE International Workshop on Machine Learning For Signal Processing (MLSP)*. Reims, France, Sept. 2014, pp. 1–6. DOI: [10.1109/MLSP.2014.6958904](https://doi.org/10.1109/MLSP.2014.6958904).
- [50] A. Lalitha, A. D. Sarwate, and T. Javidi. “Social Learning and Distributed Hypothesis Testing”. In: *Proceedings of the 2014 IEEE International Symposium on Information Theory (ISIT)*. Honolulu, HI, USA, June 2014, pp. 551–555. DOI: [10.1109/ISIT.2014.6874893](https://doi.org/10.1109/ISIT.2014.6874893).

- [51] F. Orabona, T. Hazan, A. D. Sarwate, and T. Jaakkola. “On Measure Concentration of Random Maximum A-Posteriori Perturbations”. In: *Proceedings of the 31st International Conference on Machine Learning (ICML)*. Ed. by E. P. Xing and T. Jebara. Vol. 32. JMLR Workshop and Conference Proceedings. Beijing, China: PLMR, June 2014, pp. 432–440. URL: <http://jmlr.org/proceedings/papers/v32/orabona14.html>.
- [52] S. Plis, A. Sarwate, J. Turner, M. Arbabshirani, and V. Calhoun. “From Private Sites to Big Data Without Compromising Privacy: A Case of Neuroimaging Data Classification”. In: *International Society For Pharmacoeconomics and Outcomes Research (ISPOR) 19th Annual International Meeting*. Vol. 17. May 2014, p. 3. DOI: [10.1016/j.jval.2014.03.1108](https://doi.org/10.1016/j.jval.2014.03.1108).
- [53] S. Sabato, A. D. Sarwate, and N. Srebro. “Auditing: Active Learning with Outcome-Dependent Query Costs”. In: *Advances in Neural Information Processing Systems (NIPS) 26*. Ed. by C. Burges, L. Bottou, M. Welling, Z. Ghahramani, and K. Weinberger. Curran Associates, Inc., Dec. 2013, pp. 512–520. URL: <http://papers.nips.cc/paper/4956-auditing-active-learning-with-outcome-dependent-query-costs>.
- [54] S. Song, K. Chaudhuri, and A. D. Sarwate. “Stochastic Gradient Descent with Differentially Private Updates”. In: *Proceedings of the 2013 Global Conference on Signal and Information Processing (GlobalSIP)*. Austin, TX, USA, Dec. 2013, pp. 245–248. DOI: [10.1109/GlobalSIP.2013.6736861](https://doi.org/10.1109/GlobalSIP.2013.6736861).
- [55] V. M. Prabhakaran and A. D. Sarwate. “Assisted Sampling of Correlated Sources”. In: *Proceedings of the 2013 IEEE International Symposium on Information Theory (ISIT)*. Istanbul, Turkey, July 2013, pp. 3155–3159. DOI: [10.1109/ISIT.2013.6620807](https://doi.org/10.1109/ISIT.2013.6620807).
- [56] K. Chaudhuri, A. D. Sarwate, and K. Sinha. “Near-optimal Differentially Private Principal Components”. In: *Advances in Neural Information Processing Systems (NIPS) 25*. Ed. by P. Bartlett, F. C. N. Pereira, C. J. C. Burges, L. Bottou, and K. Q. Weinberger. Curran Associates, Inc., Dec. 2012, pp. 989–997. URL: http://books.nips.cc/papers/files/nips25/NIPS2012_0482.pdf.
- [57] A. D. Sarwate. “Merging Opinions by Social Sampling of Posteriors”. In: *Proceedings of the 50th Annual Allerton Conference on Communication, Control and Computation*. Monticello, IL, USA, Oct. 2012, pp. 379–385. DOI: [10.1109/Allerton.2012.6483243](https://doi.org/10.1109/Allerton.2012.6483243).
- [58] B. K. Dey, S. Jaggi, M. Langberg, and A. D. Sarwate. “Improved Upper Bounds on the Capacity of Binary Channels with Causal Adversaries”. In: *Proceedings of the 2012 IEEE International Symposium on Information Theory (ISIT)*. Cambridge, MA, USA, July 2012, pp. 681–685. DOI: [10.1109/ISIT.2012.6284300](https://doi.org/10.1109/ISIT.2012.6284300).
- [59] A. D. Sarwate. “An AVC perspective on correlated jamming”. In: *Proceedings of the International Conference on Signal Processing and Communications (SPCOM)*. Bangalore, India, July 2012, pp. 1–5. DOI: [10.1109/SPCOM.2012.6290241](https://doi.org/10.1109/SPCOM.2012.6290241).
- [60] A. D. Sarwate and T. Javidi. “Distributed learning from social sampling”. In: *Proceedings of the 46th Annual Conference on Information Sciences and Systems (CISS)*. Princeton, NJ, USA, Mar. 2012. DOI: [10.1109/CISS.2012.6310767](https://doi.org/10.1109/CISS.2012.6310767).
- [61] A. D. Sarwate and T. Javidi. “Opinion Dynamics and Distributed Learning of Distributions”. In: *Proceedings of the 49th Annual Allerton Conference on Communication, Control and Computation*. Monticello, IL, USA, Sept. 2011, pp. 1151–1158. DOI: [10.1109/Allerton.2011.6120297](https://doi.org/10.1109/Allerton.2011.6120297).

- [62] S. A. Vinterbo, A. D. Sarwate, and A. Boxwala. “Protecting Count Queries in Cohort Identification”. In: *Proceedings of the 2011 AMIA Summit on Clinical Research Informatics*. San Francisco, CA, USA, Mar. 2011, pp. 1–1. URL: <https://knowledge.amia.org/amia-55142-cri2011a-1.644380/t-002-1.644745/f-001-1.644746/a-043-1.644772/an-043-1.644773>.
- [63] N. P. Santhanam, M. Madiman, and A. D. Sarwate. “Redundancy of exchangeable estimators”. In: *Proceedings of the 48th Annual Allerton Conference on Communication, Control, and Computing*. Monticello, IL, USA, Sept. 2010, pp. 1153–1157. DOI: [10.1109/ALLERTON.2010.5707041](https://doi.org/10.1109/ALLERTON.2010.5707041).
- [64] M. Wigger and A. D. Sarwate. “Linear Strategies for the Gaussian MAC With User Cooperation”. In: *Proceedings of the 48th Annual Allerton Conference on Communication, Control and Computation*. Monticello, IL, USA, Sept. 2010, pp. 1046–1053. DOI: [10.1109/ALLERTON.2010.5707025](https://doi.org/10.1109/ALLERTON.2010.5707025).
- [65] S. Checkoway, A. Sarwate, and H. Shacham. “Single-Ballot Risk-Limiting Audits Using Convex Optimization”. In: *Proceedings of the 2010 Electronic Voting Technology Workshop/Workshop on Trustworthy Elections (EVT/WOTE)*. Washington, DC, USA, Aug. 2010, pp. 1–15. URL: http://static.usenix.org/events/evt/tech/full_papers/Checkoway.pdf.
- [66] A. D. Sarwate. “Coding against myopic adversaries”. In: *Proceedings of the 2010 Information Theory Workshop (ITW)*. Dublin, Ireland, Aug. 2010, pp. 1–5. DOI: [10.1109/CIG.2010.5592896](https://doi.org/10.1109/CIG.2010.5592896).
- [67] B. K. Dey, M. Langberg, S. Jaggi, and A. D. Sarwate. “Coding against delayed adversaries”. In: *Proceedings of the 2010 IEEE International Symposium on Information Theory (ISIT)*. Austin, Texas, USA, June 2010, pp. 285–289. DOI: [10.1109/ISIT.2010.5513325](https://doi.org/10.1109/ISIT.2010.5513325).
- [68] A. D. Sarwate and A. G. Dimakis. “Gossip and consensus in mobile networks”. In: *Proceedings of the Third International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*. Aruba, Dutch Antilles, Dec. 2009, pp. 57–60. DOI: [10.1109/CAMSAP.2009.5413238](https://doi.org/10.1109/CAMSAP.2009.5413238).
- [69] T. C. Aysal, A. D. Sarwate, and A. G. Dimakis. “Reaching consensus in wireless networks with probabilistic broadcast”. In: *Proceedings of the 47th Annual Allerton Conference on Communication, Control, and Computation*. Monticello, IL, USA, Sept. 2009, pp. 732–739. DOI: [10.1109/ALLERTON.2009.5394935](https://doi.org/10.1109/ALLERTON.2009.5394935).
- [70] A. D. Sarwate and M. Gastpar. “Some observations on limited feedback for multiaccess channels”. In: *Proceedings of the 2009 IEEE International Symposium on Information Theory (ISIT)*. Seoul, South Korea, June 2009. DOI: [10.1109/ISIT.2009.5205742](https://doi.org/10.1109/ISIT.2009.5205742).
- [71] A. D. Sarwate and A. G. Dimakis. “The Impact of Mobility on Gossip Algorithms”. In: *Proceedings of the 28th Annual International Conference on Computer Communications (INFOCOM)*. Rio de Janeiro, Brazil, Apr. 2009, pp. 2088–2096. DOI: [10.1109/INFCOM.2009.5062132](https://doi.org/10.1109/INFCOM.2009.5062132).
- [72] T. C. Aysal, M. E. Yildiz, A. D. Sarwate, and A. Scaglione. “Broadcast Gossip Algorithms: Design and Analysis for Consensus”. In: *Proceedings of the 47th IEEE Conference on Decision and Control (CDC)*. Cancún, Mexico, Dec. 2008, pp. 4843–4848. DOI: [10.1109/CDC.2008.4739315](https://doi.org/10.1109/CDC.2008.4739315).
- [73] A. D. Sarwate and M. Gastpar. “Arbitrarily dirty paper coding and applications”. In: *Proceedings of the 2008 IEEE International Symposium on Information Theory (ISIT)*. Toronto, Canada, July 2008, pp. 925–929. DOI: [10.1109/ISIT.2008.4595122](https://doi.org/10.1109/ISIT.2008.4595122).
- [74] A. D. Sarwate and M. Gastpar. “Adversarial interference models for multiantenna cooperative systems”. In: *Proceedings of the 42nd Annual Conference on Information Sciences and Systems (CISS)*. Princeton, NJ, USA, Mar. 2008, pp. 785–790. DOI: [10.1109/CISS.2008.4558627](https://doi.org/10.1109/CISS.2008.4558627).

- [75] A. D. Sarwate and M. Gastpar. “Rateless coding with partial CSI at the decoder”. In: *Proceedings of the 2007 Information Theory Workshop (ITW)*. Lake Tahoe, CA, USA, Sept. 2007, pp. 378–383. DOI: [10.1109/ITW.2007.4313104](https://doi.org/10.1109/ITW.2007.4313104).
- [76] A. D. Sarwate, B. Nazer, and M. Gastpar. “Spatial filtering in sensor networks using computation codes”. In: *Proceedings of the 2007 IEEE Statistical Signal Processing Workshop (SSP)*. Madison, WI, USA, Aug. 2007, pp. 635–639. DOI: [10.1109/SSP.2007.4301336](https://doi.org/10.1109/SSP.2007.4301336).
- [77] K. Eswaran, A. D. Sarwate, A. Sahai, and M. Gastpar. “Using zero-rate feedback on binary additive channels with individual noise sequences”. In: *Proceedings of the 2007 IEEE International Symposium on Information Theory (ISIT)*. Nice, France, June 2007, pp. 1431–1435. DOI: [10.1109/ISIT.2007.4557423](https://doi.org/10.1109/ISIT.2007.4557423).
- [78] A. D. Sarwate and M. Gastpar. “Channels with nosy “noise””. In: *Proceedings of the 2007 IEEE International Symposium on Information Theory (ISIT)*. Nice, France, June 2007, pp. 996–1000. DOI: [10.1109/ISIT.2007.4557354](https://doi.org/10.1109/ISIT.2007.4557354).
- [79] A. D. Sarwate and M. Gastpar. “Randomization for robust communication in networks, or “Brother, can you spare a bit?””. In: *Proceedings of the 44th Annual Allerton Conference on Communication, Control and Computation*. Monticello, IL, USA: Curran Associates, Inc., Sept. 2006, pp. 978–976.
- [80] A. D. Sarwate and M. Gastpar. “Randomization bounds on Gaussian arbitrarily varying channels”. In: *Proceedings of the 2006 IEEE International Symposium on Information Theory (ISIT)*. Seattle, WA, USA, July 2006, pp. 2161–2165. DOI: [10.1109/ISIT.2006.261933](https://doi.org/10.1109/ISIT.2006.261933).
- [81] A. D. Dimakis, A. D. Sarwate, and M. J. Wainwright. “Geographic Gossip : Efficient Aggregation for Sensor Networks”. In: *5th International Symposium on Information Processing in Sensor Networks (IPSN)*. Nashville, TN, USA, Apr. 2006, pp. 69–76. DOI: [10.1145/1127777.1127791](https://doi.org/10.1145/1127777.1127791).
- [82] A. D. Sarwate and M. Gastpar. “Fading observation alignment via feedback”. In: *Proceedings of the Fourth International Symposium on Information Processing in Sensor Networks (IPSN)*. Los Angeles, CA, USA, Apr. 2005, pp. 317–323. DOI: [10.1109/IPSN.2005.1440941](https://doi.org/10.1109/IPSN.2005.1440941).
- [83] A. D. Sarwate and M. Gastpar. “Estimation from Misaligned Observations with Limited Feedback”. In: *Proceedings of the 39th Conference on Information Sciences and Systems (CISS)*. Baltimore, MD, USA, Mar. 2005, pp. 1–6.

UNDER REVIEW

- [1] Y. Tao, A. D. Sarwate, S. Panta, S. M. Plis, and V. D. Calhoun. “Privacy-Preserving Visualization of Brain Functional Network Connectivity”. Under review for the IEEE International Symposium on Biomedical Imaging (ISBI 2024). Oct. 2023.
- [2] S. Banerjee, R. Cannon, T. Marrinan, T. Chiang, and A. D. Sarwate. “Robust Nonparametric Hypthesis Testing to Understand Variability in Training Neural Networks”. Under review for ICASSP 2024. Sept. 2023.
- [3] K. Nikolakakis, D. Kalogerias, and A. D. Sarwate. “Optimal Rates for Learning Hidden Tree Structures”. Under review for the IEEE Journal on Selected Areas in Information Theory (JSait). Sept. 2023.
- [4] J. H. Sanchez, B. Taki, W. Bajwa, and A. Sarwate. “Federated Learning of Tensor Generalized Linear Models with Low Separation Rank”. Under review for ICASSP 2024. Sept. 2023.
- [5] E. Silk, S. Chakraborty, N. Dasgupta, A. Sarwate, A. Lumsdaine, and T. Chiang. “Minibatching Offers Improved Generalization Performance for Second Order Optimizers”. Under review for ICASSP 2024. Sept. 2023.

- [6] A. W. Engel, Z. Wang, N. Frank, I. Dumitriu, S. Choudhury, A. Sarwate, and T. Chiang. “Faithful and Efficient Explanations for Neural Networks via Neural Tangent Kernel Surrogate Models”. Under review for the Twelfth International Conference on Learning Representations (ICLR 2024). Aug. 2023.

THESES

- [1] A. D. Sarwate. “Robust and adaptive communication under uncertain interference”. PhD thesis. University of California, Berkeley, July 2008. URL: <http://www.eecs.berkeley.edu/Pubs/TechRpts/2008/EECS-2008-86.pdf>.
- [2] A. D. Sarwate. “Observation Uncertainty in Gaussian Sensor Networks”. MA thesis. Berkeley, CA, USA: University of California, Berkeley, Dec. 2005. URL: <https://www.eecs.berkeley.edu/Pubs/TechRpts/2008/EECS-2008-86.pdf>.
- [3] A. Sarwate. “Longest Increasing Subsequences and Random Matrices”. In: *MIT Undergraduate Journal of Mathematics* 4 (2002), pp. 157–166. URL: <papers/SarwatePhaseII.pdf>.

RESEARCH SUPPORT

PNNL	<p>PNNL-642052 : \$70,000, 9/1/2022–1/31/2024</p> <p><i>Statistical Interference Generates Knowledge for Artificial Learners (SIGNAL)</i></p> <p>PI: Anand D. Sarwate</p> <p>This project uses statistical techniques to understand the variability of training ML/AI models.</p>
NSF	<p>CNS-2148104 : \$1,000,000, 5/1/2022–4/30/2025</p> <p>RINGS: REALTIME: Resilient Edge-cloud Autonomous Learning with Timely Inferences</p> <p>PI: Anand D. Sarwate, Co-PIs: Dipankar Raychaudhuri, Waheed Bajwa, Roy D. Yates</p> <p>This project studies how to design real-time operation, online decision-making, and offline training of real-time ML-based applications that are resilient to data, application, user, and system changes.</p>
NIH	<p>2R01DA040487 : \$623,113, 9/30/2020–6/30/2025</p> <p>COINSTAC 2.0: Decentralized, Scalable Analysis of Loosely Coupled Data</p> <p>PI: Vince Calhoun (Georgia State), subcontract to Rutgers (PI: Anand D. Sarwate)</p> <p>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.</p>
NSF	<p>CCF-1910110 : \$499,976, 10/1/2019–9/30/2022</p> <p>CIF: Small: ESTRELLA: Exploiting Structure in Tensors for Representation, Estimation, and Limits of Learning Algorithms</p> <p>PI: Anand D. Sarwate, Co-PI: Waheed Bajwa</p> <p>This project pursues a comprehensive theory to simplify the measurement, storage, and statistical modeling of tensor-structured data.</p>
NSF	<p>CCF-1909468: \$250,000, 10/1/2019–9/30/2022</p> <p>CIF: Small: Collaborative Research: Between Shannon and Hamming</p>

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	<p>CTA on Robotics: \$125,526, 4/16/2014–4/15/2015</p> <p>Subaward from General Dynamics to Rutgers (PI: Waheed Bajwa, Co-PIs: Athina Petropulu, Anand Sarwate)</p> <p>Active Feature Learning and Classifier Training for Object Recognition</p> <p>This work was to develop active learning approaches for feature learning for object recognition in rich data such as video. Subaward from General Dynamics.</p>
NSF	<p>CCF-1218331: \$208,426, 9/1/2012–4/30/2014</p> <p>CIF: Small: Collaborative Research: Inference by social sampling</p> <p>PI: Tara Javidi (UCSD), Co-PI: Anand D. Sarwate</p> <p>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.</p>
AcademyHealth	<p>EDM Forum: \$5,000, 11/2011</p> <p>PI: Xiaoqian Jiang (UCSD), co-PIs: Anand D. Sarwate (TTI-Chicago), Lucila Ohno-Machado (UCSD)</p> <p>Review of Technologies to Protect Patient Privacy When Sharing Data for Comparative Effectiveness Research</p> <p>Commissioned paper for a systematic review of privacy-preserving methods for sharing data for medical research.</p>
EDITORSHIPS	
10/21–ongoing	Associate Editor, IEEE Transactions on Information Theory
1/20–ongoing	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	
2021–2026	Member, Board of Governors, IEEE Information Theory Society
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	
2024	Tutorials Co-Chair, 2024 IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2024), London, UK

2023	Finance Chair, 2023 North American School of Information Theory (NASIT 2023), Philadelphia, PA
2022	Online Platform Co-Chair, 2022 IEEE International Symposium on Information Theory (ISIT 2022)
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 Poincaré, Paris, France

PROGRAM COMMITTEES (LAST 5 YEARS)

2024	Technical Program Committee, 2024 IEEE International Symposium on Information Theory (ISIT 2024)
2023	Technical Program Committee, 2023 IEEE International Symposium on Information Theory (ISIT 2023)
2022	Technical Program Committee, Workshop on the Theory and Practice of Differential Privacy (TPDP 2022)
2022	Technical Program Committee, 2022 IEEE International Symposium on Information Theory (ISIT 2022)
2022	Technical Program Committee, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2022)
2021	Technical Program Committee, 2021 IEEE International Symposium on Information Theory (ISIT 2021)
2021	Technical Program Committee, 2021 IEEE International Symposium on Information Theory (ISIT 2021)
2021	Technical Program Committee, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2021)
2020	Technical Program Committee, Workshop on the Theory and Practice of Differential Privacy (TPDP 2020)
2020	Technical Program Committee, IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2020)
2020	Technical Program Committee, NeurIPS 2020 Workshop on Privacy Preserving Machine Learning - PriML and PPML Joint Edition
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)
2020	Technical Program Committee, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 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	Technical Program Committee, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 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)

PEER REVIEWING

IEEE Transactions : Information Theory, Signal Processing, Automatic Control, Information Forensics and Security, 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 Information Theory, IEEE Journal of Selected Areas in Communication, IEEE Journal of Selected Topics in Signal Processing, IEEE Open Journal of 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, Mathematical Statistics and Learning

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, IEEE Open Journal of Signal Processing

SIAM Journal on Matrix Analysis and Applications (SIMAX)

AMS Mathematical Reviews

Conferences : ISIT (2007–2024), ITW (2008,2010,2013–2022), ICASSP (2024), MLSP (2023), EUSIPCO (2018), SPAWC (2018), GlobalSIP (2015–2017), CAMSAP (2017), DSLW (2022), COLT (2011, 2012, 2020), STOC (2010), SODA (2015), NIPS (2012–2016), ICML (2012–2016), AISTATS (2012, 2013, 2017–2019), ICC (2012), Infocom (2012), Globecom (2007, 2009), WiOpt (2015), DCOSS (2015), PIMRC (2007) CDC (2009,2012), ACC (2013, 2024), ACM Richard Tapia Celebration of Diversity in Computing Poster Track (2019),

November 26, 2023