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Research

- General interests: analysis, probability, signal processing, and algorithms.
- Specialization: randomized algorithms with applications to massive datasets and signal processing.

Education

- Ph.D., Mathematics, Princeton University, June 1997, *Multiresolution homogenization schemes for differential equations and applications*, Professor Ingrid Daubechies, advisor.
- S.B., Mathematics (with honors), University of Chicago, June 1993.

Positions Held

- John C. Malone Professor, Department of Statistics & Data Science, Yale University, 2026–present.
- John C. Malone Professor, Departments of Electrical Engineering and Statistics & Data Science, Yale University, 2023–2026.
- Director of Graduate Studies, Applied Mathematics Program, Yale University, 2023–2025.
- Chair, Applied Mathematics Program, Yale University, 2020–2023.
- John C. Malone Professor, Departments of Mathematics and Statistics & Data Science, Yale University, 2020–2023.
- Herman H. Goldstine Collegiate Professor. Department of Mathematics, University of Michigan, 2014–2020.
- Full Professor (Courtesy appointment). Division of Electrical and Computer Engineering, University of Michigan, 2010–2020.
- Full Professor. Department of Mathematics, University of Michigan, 2010–2020.
- Associate Professor (Courtesy appointment). Division of Electrical and Computer Engineering, University of Michigan, 2008–2010.
- Associate Professor. Department of Mathematics, University of Michigan, 2007–2010.
- Assistant Professor. Department of Mathematics, University of Michigan, 2004–2007.
- Principal technical staff member. Internet and Network Systems Research Center, AT&T Labs-Research, 2002–2004.
- Senior technical staff member. Information Sciences Research Center, AT&T Labs-Research, 1998–2002.
- Visiting instructor. Department of Mathematics, Stanford University, Winter quarter 2000.
- Postdoctoral research associate. Yale University and AT&T Labs-Research, 1997–1998.
- Intern. Lucent Technologies Bell Laboratories, summer 1996.
- Research assistant. Princeton University, 1994–1995.

- Intern. AT&T Bell Laboratories, summers 1993–1995.

Publications

Preprints

- Asaf Etgar, Anna Gilbert, Quanquan C. Liu, Andrew McGregor, "Parameter-Free Triangle Counting", arXiv:2609.24829, 2026.
- Zijian Wang, Gregory J. Herschlag, Joon-Hyeok Yim, Jonathan C. Mattingly, Anna C. Gilbert, "Towards stratified sampling for redistricting plans", arXiv:2609.18741, 2026.
- Asaf Etgar, Anna Gilbert, Quanquan C. Liu, Andrew McGregor, "Scalable Triangle Counting: The Threshold Algorithm", arXiv:2609.15848, 2026.
- Asaf Etgar and Anna Gilbert, "Metric repair is two problems: Which edges, and what weights", arXiv:2608.07715, 2026.
- Asaf Etgar, Anna C. Gilbert, Jamie Tucker-Foltz, "Structural Tractability Frontiers for Metric Repair", arXiv:2607.29649, 2026.
- Anna C. Gilbert and Joon-Hyeok Yim, "Hyperbolicity, slimness, and minsize, on average", arXiv:2412.05746, 2024.
- Anna C. Gilbert and Kevin O'Neill, "Sketching the Heat Kernel: Using Gaussian Processes to Embed Data", arXiv:2403.07929, 2024.

Refereed Journal Publications

- Yifei He, Isay Katsman, Guannan Liu, Sungwoo Sohn, Mark D. Shattuck, Corey S. O'Hern, Anna Gilbert, Jan Schroers, "Can machine learning predict the liquidus temperature of binary alloys?", *Acta Materialia*, Volume 312, 122220, 2026.
- Isay Katsman, Ethan Lou, Anna Gilbert, "Revisiting Graph Learning Benchmarks: When is the Graph Actually Necessary?", *Neural Processing Letters*, vol. 58, no. 2, 2026.
- Kevin O'Neill and Anna Gilbert, "CA-PCA: Manifold dimension estimation, adapted for curvature", *SIAM Mathematics of Data Science*, vol. 7, no. 1, pages 355–383, 2025.
- Isay Katsman and Anna Gilbert, "Shedding Light on Problems with Hyperbolic Graph Learning", *Transactions on Machine Learning Research*, 2024.
- Guannan Liu, Sungwoo Sohn, Corey S. O'Hern, Anna C. Gilbert, Jan Schroers, "Effective subgrouping enhances machine learning prediction in complex materials science phenomena: Inoue's subgrouping in discovering bulk metallic glasses", *Acta Materialia*, Volume 265, 2024.
- G. Liu, S. Sohn, Sebastian A. Kube, A. Raj, A. Mertz, A. Nawano, A. Gilbert, M. D. Shattuck, C. S. O'Hern, J. Schroers, "Machine learning versus human learning in predicting glass-forming ability of metallic glasses", *Acta Materialia*, Volume 243, 2023.
- Rishi Sonthalia and Anna C. Gilbert, "Project and Forget: Solving Large-Scale Metric Constrained Problems", *Journal of Machine Learning Research*, 23:326, pages 1—54, 2023.
- Rishi Sonthalia, Anna C. Gilbert, Matthew Durham, "CubeRep: Learning Relations Between Different Views of Data", *Proceedings of Topological, Algebraic, and Geometric Learning Workshops 2022*, PMLR 196:298-303, 2022.
- Anna C. Gilbert and Audra McMillan, "Local Differential Privacy for Physical Sensor Data and Sparse Recovery," to appear in *Applied and Computational Harmonic Analysis*, 2021.
- Alexander H. S. Vargo, Anna C. Gilbert: "A rank-based marker selection method for high throughput scRNA-seq data", BMC Bioinformatics 21(1): 477 (2020).

- Anna C. Gilbert, Howard W. Levinson, John C. Schotland: Nonlinear Iterative Hard Thresholding for Inverse Scattering. SIAM J. Imaging Sci. 13(1): 108-140 (2020).
- Yang Liu, Abdulkadir C. Yucel, Hakan Bagci, Anna C. Gilbert, Eric Michielssen, "A Wavelet-Enhanced PWTD-Accelerated Time-Domain Integral Equation Solver for Analysis of Transient Scattering from Electrically Large Conducting Objects", in *IEEE Transactions on Antennas and Propagation*, 2018.
- F. J. Chung, A. C. Gilbert, J. G. Hoskins, and J. C. Schotland, "Optical tomography on graphs", *Inverse Problems*, Volume 33, Number 5, 2017.
- Anna C. Gilbert, Yi Li, Ely Porat, Martin J. Strauss, "For-All Sparse Recovery in Near-Optimal Time," *ACM Transactions on Algorithms (TALG)*, Volume 13 Issue 3, pp. 1–32, March 2017.
- Anna C. Gilbert, Jeremy G. Hoskins, John C. Schotland, Diffuse Scattering on Graphs, *Linear Algebra and its Applications*, Volume 496, May 2016, pages 1–35.
- Anna C. Gilbert, Mark Iwen, Piotr Indyk, Ludwig Schmidt, Recent Developments in the Sparse Fourier Transform, *Signal Processing Magazine*, 31(5): 91-100, 2014.
- J. Y. Park, M. B. Wakin, and A. C. Gilbert, "Modal Analysis with Compressive Measurements", *IEEE Transactions on Signal Processing*, 62(7): 1655-1670, 2014.
- Petros Boufounos, Volkan Cevher, Anna C. Gilbert, Yi Li, Martin J. Strauss, "What's the Frequency, Kenneth: Sublinear Fourier Sampling Off the Grid", *Algorithmica*, 2014.
- B. S. Kim, J. Y. Park, A. Mohan, A. Gilbert, and S. Savarese, "Hierarchical classification of images by sparse approximation", *Image and Vision Computing*, 31(12): 982-991, 2013.
- Paul Shearer, Anna C. Gilbert, A generalization of variable elimination for separable inverse problems beyond least squares, *Inverse Problems*: 29(4), 2013.
- P. Yenduri, A. Rocca, A. Rao, S. Naraghi, M. Flynn, and A. Gilbert, A low power compressive sampling time-based analog to digital converter, *IEEE Journal on Emerging and Selected Topics in Circuits and Systems* 2(3): 502–515, 2012.
- D. Yoon, J. A. Fessler, A. C. Gilbert, and D. C. Noll, Fast joint design method for parallel excitation RF pulse and gradient waveforms considering off-resonance, *Magnetic Resonance in Medicine*, vol. 68, issue 1, 2012, pp. 278—285.
- Anna C. Gilbert, Yi Li, Ely Porat, Martin Strauss, Approximate Sparse Recovery: Optimizing Time and Measurements, *SIAM J. Comput.*, 41(2): 436-453, 2012.
- Paul Shearer, Richard A. Frazin, Alfred O. Hero, Anna C. Gilbert, The first stray light corrected EUV images of solar coronal holes, *The Astrophysical Journal Letters*, volume 749 (1), 2012.
- Vishal M. Patel, Ray Maleh, Anna C. Gilbert, and Rama Chellappa, Gradient-based image recovery methods from incomplete Fourier measurements, *IEEE Transactions on Image Processing*, vol. 21 (1), 2012, pp.94–105.
- Melina Demertzi, Pedro C Diniz, Mary W Hall, Anna C Gilbert, and Yi Wang, Domain-Specific Optimization of Signal Recognition Targeting FPGAs, *ACM Transactions on Reconfigurable Technology and Systems*, vol. 4 (2), 2011, p. 1–26.
- Raghunandan M. Kainkaryam, Angela Bruex, Anna C. Gilbert, John Schiefelbein, Peter J. Woolf, poolMC: Smart pooling of mRNA samples in microarray experiments, *BMC Bioinformatics* vol. 11, no. 299, 2010.
- A. C. Gilbert, P. Indyk, Sparse recovery using sparse matrices, *Proceedings of the IEEE*, vol. 98, issue 6, 2010, pp. 937–947.
- A. C. Gilbert, M. J. Strauss, J. A. Tropp, A Tutorial on Fast Fourier Sampling, *IEEE Signal Processing Magazine*, vol. 25, no. 2, 2008, pp. 57–66.

- A. C. Gilbert, M. J. Strauss, Analysis of Data Streams: Computational and Algorithmic Challenges, *Technometrics*, vol. 49, no. 3, August 2007, pp. 346–356.
- M. A. Iwen, A. C. Gilbert, M. J. Strauss, Empirical evaluation of a sub-linear time sparse DFT algorithm, *Communications in Mathematical Sciences*, vol. 5, no. 4, 2007, pp. 981–998.
- Joel A. Tropp, Anna C. Gilbert, Signal recovery from random measurements via Orthogonal Matching Pursuit, *IEEE Trans. on Info. Theory*, vol. 53, no. 12, 2007, pp. 4655–4666.
- J. Zou, A. Gilbert, M. Strauss, and I. Daubechies, Theoretical and Experimental Analysis of a Randomized Algorithm for Sparse Fourier Transform Analysis, *Journal of Computational Physics*, vol. 211, No. 2, 2006, pp. 572–595.
- A. C. Gilbert, M. J. Strauss, and J. .A. Tropp, Algorithms for Simultaneous Sparse Approximation, special issue on sparse approximations in signal and image processing of *EURASIP J. Signal Processing*, 2005.
- J. Fong, A. C. Gilbert, S. Kannan, and M. Strauss, Better alternatives to OSPF routing, special issue of *Algorithmica* on network design, vol. 43, Nos.1–2, 2005, pp.113–131.
- A. C. Gilbert, Y. Kotidis, S. Muthukrishnan, and M. Strauss, Domain-driven data synopses for dynamic quantiles, *IEEE Transactions on Knowledge and Data Engineering*, vol. 17, no. 7, 2005, pp. 927–938.
- Don Caldwell, Anna Gilbert, Joel Gottlieb, Albert Greenberg, Gísli Hjálmtýsson, Jennifer Rexford, *The cutting EDGE of IP router configuration*, Computer Communication Review 34(1): 21–26 (2004).
- A. C. Gilbert, Y. Kotidis, S. Muthukrishnan, and M. J. Strauss, One-pass wavelet decompositions of data streams, *IEEE Transactions on Knowledge and Data Engineering*, vol. 15, no. 3, 2003, pp. 541–554.
- S. Resnick, G. Samorodnitsky, A. Gilbert, and W. Willinger, Wavelet analysis of conservative cascades, *Bernoulli*, 9(1):97–135, 2003.
- A. C. Gilbert, Multiscale analysis and data networks, *Applied and Computational Harmonic Analysis*, vol. 10, no. 3, pp. 185–202, May 2001.
- Y. Joo, V. Ribeiro, A. Feldmann, A. C. Gilbert, and W. Willinger, TCP/IP traffic dynamics and network performance: A lesson in workload modeling, flow control, and trace-driven simulations, *ACM SIGCOMM Computer Communication Review*, 2001.
- A. C. Gilbert, W. Willinger, A. Feldmann, Scaling analysis of random cascades, with applications to network traffic, *IEEE Trans. on Information Theory*, Vol. 45, **3**, 1999, pp. 971–991.
- A. Feldmann, A. C. Gilbert, W. Willinger and T. G. Kurtz, The changing nature of network traffic: Scaling phenomena, *ACM SIGCOMM Computer Communication Review*, Vol. 28, **2**, April 1998, pp. 5–29.
- A. C. Gilbert, A comparison of multiresolution and classical one-dimensional homogenization schemes, *Applied and Computational Harmonic Analysis*, vol. 5, no. 1, January 1998, pp. 1–35.
- G. Beylkin, M. E. Brewster and A. C. Gilbert, A multiresolution strategy for numerical reduction and homogenization of nonlinear ODEs, *Applied and Computational Harmonic Analysis*, vol. 5, no. 4, October 1998, pp. 312–331.

Refereed Conference Publications

- Doron Haviv, Russell Zhang Kunes, Thomas Dougherty, Cassandra Burdziak, Tal Nawy, Anna Gilbert, Dana Pe'er: Wasserstein Wormhole: Scalable Optimal Transport Distance with Transformer, *ICML 2024*, 2024.
- Joon-hyeok Yim, Anna Gilbert, Fitting trees to ℓ_1 hyperbolic distances, *NeurIPS 2023*, 2023.

- Rishi Sonthalia, Anna Gilbert, Matthew Durham, RelWire: Metric Based Graph Rewiring, *NeurIPS 2023 Workshop on Symmetry and Geometry in Neural Representations*, 2023.
- Y. Zhang, A. C. Gilbert, S. Steinerberger, "May the force be with you", *Allerton Conference on Control and Communication, 2022.*
- Rishi Sonthalia, Gregory Van Buskirk, Benjamin Raichel, Anna C. Gilbert, "How can classical multidimensional scaling go wrong?", *NeurIPS 2021.*
- Anna C. Gilbert, Albert Gu, Christopher Ré, Atri Rudra, Mary Wootters, "Sparse Recovery for Orthogonal Polynomial Transforms", *ICALP* 2020: 58:1-58:16.
- Rishi Sonthalia, Anna C. Gilbert, "Tree! I am no Tree! I am a low dimensional Hyperbolic Embedding", *NeurIPS 2020*, 2020.
- Chenglin Fan, Anna C. Gilbert, Benjamin Raichel, Rishi Sonthalia, Gregory Van Buskirk, "Generalized Metric Repair on Graphs," *SWAT 2020*: 25:1-25:22.
- Lalit Jain, Anna C. Gilbert, Umang Varma, "Spectral Methods for Ranking with Scarce Data," *UAI 2020:* 609-618.
- Anna C. Gilbert, Audra McMillan, "Property Testing For Differential Privacy," in the proceedings of *Allerton Conf. on Communication, Control, and ComputingAllerton 2018*: 249-258.
- Anna C. Gilbert, Rishi Sonthalia, "Unsupervised Metric Learning in Presence of Missing Data," in the proceedings of *Allerton Conf. on Communication, Control, and ComputingAllerton 2018*: 313-321.
- Yitong Sun, Anna C. Gilbert, Ambuj Tewari, "But How Does It Work in Theory? Linear SVM with Random Features," *NeurIPS 2018*: 3383-3392.
- Anna C. Gilbert and Audra McMillan, "Local Differential Privacy for Physical Sensor Data and Sparse Recovery", in the proceedings of *IEEE Annual Conference on Information Sciences and Systems (CISS)*, 2018.
- Anna C. Gilbert, Lalit Jain, "If it ain't broke, don't fix it: Sparse metric repair," in the proceedings of *Allerton Conf. on Communication, Control, and Computing 2017*, 2017.
- Anna C. Gilbert, Yi Zhang, Kibok Lee, Yuting Zhang, Honglak Lee, "Towards Understanding the Invertibility of Convolutional Neural Networks," in the proceedings of *International Joint Conference on Artificial Intelligence 2017*, 2017.
- Anna Gilbert and Audra McMillan, "Recovery of sparse heat source signals from locally differentially private sensor data via constrained ℓ_1 minimisation," in the proceedings of *SPARS 2017*, 2017.
- Wenling Shang, Kihyuk Sohn, Honglak Lee, Anna Gilbert, "Discriminative Training of Structured Dictionaries via Block Orthogonal Matching Pursuit," *2016 SIAM International Conference on Data Mining*, 2016.
- Y. Liu, A. C. Yücel, A. C. Gilbert, H. Bağcı and E. Michielssen, "A wavelet-based PWTD algorithm-accelerated time domain surface integral equation solver," *Radio Science Meeting (Joint with AP-S Symposium), 2015 USNC-URSI*, Vancouver, BC, Canada, 2015.
- J. Y. Park, A. C. Gilbert, and M. B. Wakin, "Compressive Measurement Bounds for Wireless Sensor Networks in Structural Health Monitoring," *World Conference on Structural Control and Monitoring (WCSCM)*, Barcelona, Spain, July 2014.
- J. Y. Park, M. B. Wakin, and A. C. Gilbert, "Sampling Considerations for Modal Analysis with Damping," *Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems at SPIE Smart Structures/NDE*, San Diego, California, March 2015.
- Anna C. Gilbert, Yi Li, Ely Porat, Martin J. Strauss, "For-All Sparse Recovery in Near-Optimal Time", *ICALP*, 538-550, 2014.

- Sean M O'Connor, Jerome P Lynch, Anna C Gilbert, Implementation of a compressive sampling scheme for wireless sensors to achieve energy efficiency in a structural health monitoring system, *Proc. SPIE 8694 Nondestructive Characterization for Composite Materials, Aerospace Engineering, Civil Infrastructure, and Homeland Security 2013*, 2013.

- A. C. Gilbert, J. Y. Park, and M. B. Wakin, Sketched SVD: Recovering Spectral Features from Compressive Measurements, *Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, 2013 **(Best Student Paper Award)**.

- Paul Shearer, Anna C. Gilbert, Alfred O. Hero III, Correcting Camera Shake by Incremental Sparse Approximation, *International Conference on Image Processing (ICIP)*, 2013 **(Best Paper Award)**.

- Denisa Duma, Mary Wootters, Anna C. Gilbert, Hung Q. Ngo, Atri Rudra, Matthew Alpert, Timothy J. Close, Gianfranco Ciardo, Stefano Lonardi, *Accurate Decoding of Pooled Sequenced Data Using Compressed Sensing*, WABI 2013: 70–84.

- Anna C. Gilbert, Hung Q. Ngo, Ely Porat, Atri Rudra, Martin J. Strauss, ℓ_2/ℓ_2-foreach sparse recovery with low risk, *ICALP*, 2013: 461–472.

- Chun Lo, Mingyan Liu, Jerome P. Lynch, Anna C. Gilbert, Efficient Sensor Fault Detection Using Combinatorial Group Testing,*IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS 2013)*, 2013: 199–206.

- Praveen Yenduri and Anna C. Gilbert, Compressive, Collaborative Spectrum Sensing for Wideband Cognitive Radios, *The Ninth International Symposium on Wireless Communication Systems*, 2012.

- Petros Boufounos, Volkan Cevher, Anna C. Gilbert,Yi Li, and Martin J. Strauss, What's the frequency, Kenneth?: Sublinear Fourier Sampling Off the Grid, *Proceedings of RANDOM/APPROX 2012*, 2012.

- Praveen K. Yenduri, Anna C. Gilbert, and Jun Zhang, Integrate-and-Fire Neuron Modeled as a Low-Rate Sparse Time-Encoding Device, *Proceedings of Third International Conference on Intelligent Control and Information Processing*, 2012.

- Anna C. Gilbert, Brett Hemenway, Atri Rudra, Martin J. Strauss, and Mary Wootters, Recovering simple signals, *Proceedings of Information Theory and Applications*, 2012, pp. 382—391.

- B. S. Kim, J. Y. Park, A. Mohan, A. Gilbert, and S. Savarese, Hierarchical classification of images by sparse approximation, in J. Hoey, S. McKenna, and E. Trucco, editors, *Proceedings of the British Machine Vision Conference*, BMVC Press, September 2011.

- S. M. O'Connor, J. P. Lynch, and A. C. Gilbert, Compressive sensing approach for structural health monitoring of ship hulls, in F.-K. Chang, editor, *Proceedings of the Eighth International Workshop on Structural Health Monitoring*, pages 1675–1683. DESTech Publications, Inc., 2011.

- P. Yenduri, A. Gilbert, M. Flynn, and S. Naraghi, Rand PPM: A low-power compressive sampling analog to digital converter, *2011 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pages 5980–5983, 2011.

- Daehyun Yoon, Jeffrey A. Fessler, Jon-Frederik Nielsen, Anna C. Gilbert, and Douglas C. Noll, Nonconvex greedy compressed sensing for phase contrast MRI, in *Proceedings of ISMRM*, Stockholm SWEDEN, 2010.

- Daehyun Yoon, Jeffrey A. Fessler, Anna C. Gilbert, and Douglas C. Noll A fast parallel excitation pulse design for efficient selection and ordering of PE locations with B0 field inhomogeneity, in *Proceedings of ISMRM*, Montreal, CANADA, 2011.

- Xiangming Kong, Peter Petre, Roy Matic, Anna Gilbert, Martin Strauss, An analog-to-information converter for wideband signals using a time encoding machine, in *Proceedings of Digital Signal Processing Workshop and IEEE Signal Processing Education Workshop (DSP/SPE)*, 2011, pages 414–419.

- Anna C. Gilbert, Yi Li, Ely Porat, Martin J. Strauss, Approximate sparse recovery: optimizing time and measurements, in *Proc. of ACM Symposium on Theory of Computing 2010*, STOC 2010, pp. 475–484.

- Daehyun Yoon, Ray Maleh, Anna C. Gilbert, J. A. Fessler, Douglas C. Noll, Fast selection of phase encoding locations in parallel excitation, in *Proc. Intl. Soc. Mag. Res. Med.*, 2009, p. 2595.
- R. Maleh, D. Yoon, A. C. Gilbert, Fast Algorithm for Sparse Signal Approximation using Multiple Additive Dictionaries, in *Proc. of Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, 2009.
- Melina Demertzi, Pedro C. Diniz, Mary W. Hall, Anna C. Gilbert, Yi Wang, Computation reuse in domain-specific optimization of signal recognition, in *Proc. of FPGA*, 2009, p. 281.
- V. Cevher, P. Boufounos, R. G. Baraniuk, A. C. Gilbert, M. J. Strauss, Near-optimal Bayesian localization via incoherence and sparsity, in *Proc. of International Conference on Information Processing in Sensor Networks*, 2009, pp. 205–216.
- Daehyun Yoon, Ray Maleh, Anna C. Gilbert, J. A. Fessler, Douglas C. Noll, Sparsity in MRI parallel excitation, in *Proc. of Houston Society for Engineering in Medicine and Biology Conf.*, p. 55, 2009. Invited presentation for "Sparsity-driven medical imaging" symposium.
- M. Demertzi, P. C. Diniz, M. W. Hall, A. C. Gilbert, Yi Wang, The potential of computation reuse in high-level optimization of a signal recognition system, in *Proc. of IEEE International Symposium on Parallel and Distributed Processing (IPDPS)*, 2008, pp. 1–5.
- R. Berinde, A. C. Gilbert, P. Indyk, H. Karloff, M. J. Strauss, Combining geometry and combinatorics: A unified approach to sparse signal recovery, in *Proc. of 46th Annual Allerton Conference on Communication, Control, and Computing*, 2008, pp. 798–805.
- A. C. Gilbert, M. A. Iwen, M. J. Strauss, Group testing and sparse signal recovery, in *Proc. of the 42nd Asilomar Conference on Signals, Systems and Computers*, 2008, pp. 1059–1063.
- R. Maleh, A. C. Gilbert, Sublinear recovery of sparse wavelet signals, proceedings of *Data Compression Conference (DCC) 2008*, 2008.
- Y. Massound, S. Pfetsch, T. Ragheb, J. Laska, H. Nejati, A. Gilbert, M. Strauss, R. Baraniuk, On the feasibility of hardware implementation of sub-Nyquist random-sampling based analog-to-information conversion, proceedings of *IEEE Interational Symposium on Circuits and Systems (ISCAS) 2008*, 2008.
- A. C. Gilbert, M. J. Strauss, Fundamental performance bounds for a compressive sampling system, proceedings of *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2008*, 2008.
- X. Shi, M. Bonner, L. Adamic, A. C. Gilbert, The very small world of the well-connected, proceedings of *ACM Conference on Hypertext and Hypermedia 2008*, 2008. **(Awarded ACM Douglas Engelbart Award)**
- Anna C. Gilbert, Martin J. Strauss, Joel A. Tropp, Roman Vershynin, One sketch for all: fast algorithms for compressed sensing, in *Proc. of ACM Symposium on Theory of Computing 2007*, STOC 2007, pp. 237–246.
- M. Demertzi, P. C. Diniz, M. W. Hall, A. C. Gilbert, Y. Wang, A Combined Hardware/Software Optimization Framework for Signal Representation and Recognition, proceedings of *International Conference on Computational Science*, vol. 1, 2007, pp. 1230–1237.
- R. Maleh, A. C. Gilbert, M. J. Strauss, Sparse Gradient Image Reconstruction Done Faster, proceedings of *IEEE International Conference on Image Processing (ICIP) 2007*, vol. 2, 2007, pp. 77–80.
- K. Herrity, A. C. Gilbert, and J. Tropp, Sparse Approximation via Iterative Thresholding, in *Proceedings of the 2006 IEEE International Conference on Acoustics, Speech, and Signal Processing ICASSP*, Toulouse, France, 2006.
- W. Aiello, A. C. Gilbert, B. Rexroad, and V. Sekar, Sparse Approximations for High Fidelity Compression of Network Traffic Data, in *Proceedings of ACM Internet Measurement Conference IMC 2005*, New Orleans, LA, October 2005.

- A. C. Gilbert and J. A. Tropp, Applications of Sparse Approximations in Communications, in *Proceedings of IEEE International Symposium on Information Theory ISIT 2005*, September 2005.
- A. C. Gilbert, S. Muthukrishnan, and M. J. Strauss, Improved time bounds for near-optimal sparse Fourier representation via sampling, in *Proceedings of SPIE Wavelets XI*, San Diego, CA, 2005.
- J. Tropp, A. C. Gilbert, and M. J. Strauss, Simultaneous sparse approximation via greedy pursuit, invited paper, special session on "Sparse representations in signal processing", in *Proceedings of the 2005 IEEE International Conference on Acoustics, Speech, and Signal Processing ICASSP*, Philadelphia, PA, March 2005.
- A. R. Calderbank, A. C. Gilbert, K. Levchenko, S. Muthukrishnan, and M. Strauss, Improved range-summable random variable construction algorithms, in *Proceedings of the 2005 SIAM Symposium on Discrete Algorithms SODA*, Vancouver, BC, January 2005.
- J. A. Tropp, A. .C. Gilbert, S. Muthukrishnan, and M. J. Strauss, Improved sparse approximation over quasi-incoherent dictionaries, *IEEE International conference on image processing ICIP*, pp. 37–40, 2003.
- A. C. Gilbert, S. Muthukrishnan, and M. J. Strauss, Approximation of Functions over Redundant Dictionaries Using Coherence, in *Proceedings of 2003 SIAM Symposium on Discrete Algorithms SODA*, pp. 243–252, 2003.
- A. C. Gilbert and H. Karloff, On the Fractal Behavior of TCP, *Proc. of the 2003 ACM Symposium on Theory of Computing STOC*, pp. 297–306, 2003.
- A. C. Gilbert, Y. Kotidis, S. Muthukrishnan, M. J. Strauss, How to summarize the universe: Dynamic maintenance of quantiles, in *Proc. of the 2002 Conference on Very Large Databases VLDB*, pp. 454–465, 2002.
- A. C. Gilbert, S. Guha, P. Indyk, Y. Kotidis, S. Muthukrishnan, M. J. Strauss, Fast, Small-Space Algorithms for Approximate Histogram Maintenance, in *Proc. of the 2002 ACM Symposium on Theory of Computing STOC*, pp. 389–398, 2002.
- A. C. Gilbert, S. Guha, P. Indyk, S. Muthukrishnan, M. J. Strauss, Near-Optimal Sparse Fourier Representations via Sampling, *Proc. of the 2002 ACM Symposium on Theory of Computing STOC*, pp. 152–161, 2002.
- A. C. Gilbert, Y. Kotidis, S. Muthukrishnan, M. Strauss, Surfing wavelets on streams: one-pass summaries for approximate aggregate queries, in *Proc. of the 2001 Conference on Very Large Databases VLDB*, pp. 79–88, 2001.
- A. C. Gilbert, Y. Kotidis, S. Muthukrishnan, M. Strauss, Optimal and Approximate Computation of Summary Statistics for Range Aggregates, in *Proc. of the 2001 ACM Principles of Database Systems PODS*, pp. 227–236, Santa Barbara, 2001.
- M. Gupta and A. Gilbert, Nonlinear vector multiresolution analysis, *Proc. of the 34th Asilomar Conference on Signals, Systems, and Computers*, 2000.
- A. Feldmann, A. C. Gilbert, P. Huang, and W. Willinger, Dynamics of IP Traffic: A Study of the Role of Variability and the Impact of Control, in *Proc. of the ACM SIGCOMM'99*, pp. 301–313, Boston, MA, 1999.
- Y. Joo, V. Ribeiro, A. Feldmann, A. C. Gilbert, and W. Willinger, On the impact of variability on the buffer dynamics in IP networks, in *Proc. of the 37th Annual Allerton Conference on Communication, Control, and Computing*, Allerton, IL, 1999.
- A. Feldmann, A. C. Gilbert, and W. Willinger, Data networks as cascades: Investigating the multifractal nature of Internet WAN traffic, in *Proc. of the ACM SIGCOMM'98*, pp. 42–55, Vancouver, B.C., 1998.
- A. C. Gilbert, A. Feldmann, W. Willinger, Visualizing multifractal scaling behavior: A simple scaling heuristic, in *Proc. of the 32nd Asilomar Conference on Signals, Systems, and Computers*, 1998.

- A. Feldmann, A. C. Gilbert, W. Willinger and T. G. Kurtz, Looking behind and beyond self-similarity: Scaling phenomena in measured WAN traffic, in *Proc. of the 35th Annual Allerton Conference on Communication, Control and Computing*, pp. 269–280, 1997.

Refereed Workshop Publications

- Isay Katsman and Anna C. Gilbert, "Harmonic Sampling: Zero-Parameter Flows on Compact Manifolds", *ICML 2026 Workshop on AI for Physics (AI4Physics)*, 2026.

- Sean M. O'Connor, Jerome P. Lynch, and Anna C. Gilbert, Implementation of a compressive sampling scheme for wireless sensors to achieve energy efficiency in a structural health monitoring system, in *Proc. SPIE 8694, Nondestructive Characterization for Composite Materials, Aerospace Engineering, Civil Infrastructure, and Homeland Security*, April 2013

- A. C. Gilbert, B. Hemenway, M. J. Strauss, D. P. Woodruff, and M. Wootters, Reusable low-error compressive sampling schemes through privacy, *Proceedings of IEEE Statistical Signal Processing Workshop*, 2012.

- X. Kong, P. Petre, R. Matic, A. Gilbert, and M. Strauss, An analog-to-information converter for wideband signals using a time encoding machine, in *2011 IEEE Digital Signal Processing Workshop and IEEE Signal Processing Education Workshop (DSP/SPE)*, pages 414–419, Jan. 2011.

- Daehyun Yoon, J. A. Fessler, Anna C. Gilbert, Douglas C. Noll, Simultaneous signal loss correction from B1 and B0 field inhomogeneity in BOLD fMRI with parallel excitation, in *ISMRM Workshop on Parallel MRI*, 2009.

- Praveen K. Yenduri and Anna C. Gilbert, Continuous Fast Fourier Sampling, in *Proc. of Sampling Theory and Applications (SampTA)*, 2009.

- R. Maleh, A. C Gilbert, Multichannel image estimation via simultaneous orthogonal matching pursuit, in *Proc. of Statistical Signal Processing Workshop 2007*, 2007.

- J. Laska, S. Kirolos, Y. Massoud, R. Baraniuk, A. Gilbert, M. Iwen, and M. Strauss, Random sampling for analog-to-information conversion of wideband signals, in *Fifth IEEE Dallas Circuits and Systems Workshop*, October 2006.

- A. C. Gilbert, M. J. Strauss, J. A. Tropp, and R. Vershynin, Sublinear approximation of compressible signals, Invited paper, special session on "Compressive Sensing," in *Proceedings of SPIE Intelligent Integrated Microsystems*, Orlando, April 2006.

- A. C. Gilbert and K. Levchenko, Compressing network graphs, in *Proceedings of the LinkKDD workshop at the 10th ACM Conference on KDD*, August 2004.

- J. Fong, A. Gilbert, S. Kannan, and M. Strauss, Better alternatives to OSPF routing, in *Proc. of Workshop on Approximation and Randomized Algorithms in Communication Networks (ARACNE)*, 2001.

- M. Gupta and A. Gilbert, Robust speech recognition using wavelet coefficient features, *Proc. of IEEE Automatic Speech Recognition and Understanding Workshop*, Italy, 2001.

- S. Seuret and A. Gilbert, Pointwise Hölder exponent estimation in data network traffic, *International Teletraffic Congress Workshop*, Monterey, CA, 2000.

- A. C. Gilbert, Y. Joo, and N. McKeown, Congestion control and periodic behavior, *Proc. of IEEE LANMAN Workshop*, Boulder, CO, 2001.

Book Chapters

- Anna C. Gilbert, "Dynamics of congestion control," in *Complex Dynamics in Communication Networks*, G. Vattay and L. Kocarev, eds., Springer-Verlag, 2005.

- A. C. Gilbert, "Multiresolution homogenization schemes for differential equations and applications," in *Topics in analysis and its applications: Selected theses*, Ronald Coifman, ed., World Scientific, 2000.
- I. C. Daubechies and A. C. Gilbert, "Harmonic analysis, wavelets, and applications," in *Hyperbolic Equations and Frequency Interactions*, Luis Cafarelli and Weinan E, eds., IAS/Park City Mathematics Series, Vol. 5, 1998.

Grants

- NSF Science and Technology Center: TEMPEST (Transformative Explorations in Multi-Physics and Engineering of Scientific Turbulence), co-PI (Michael S. Murillo, Michigan State University, PI), September 2026–August 2031, $30 million (center total).
- MIDAS Challenge grant, co-PI and co-director of Michigan Institute for Single Cell Data Analysis, March 2017–February 2020, $1.2 million.
- Simons Foundation Fellowship, 2017–2018.
- Samsung research funds, "Neural Network Inspired Compressive Sensing and Image Processing," Prof. Michael Flynn (ECE) PI, $60,000, 2013–2020.
- NSF AF (Medium, Collaborative Research): Sparse Approximation: Theory and Extensions, PI, July 2012–June 2017, $603,000
- ARO 61819-MA: Semi-inner-products in Banach Spaces with Applications to Regularized Learning, Sampling, and Sparse Approximation, co-PI, July 2012–June 2013, $65,000.
- NSF SCREMS: Scientific Computing and Mathematics at the University of Michigan, co-PI, NSF DMS 1026317, September 2010—August 2013, $175,000.
- Sensing Sensors: Compressed Sampling with Co-design of Hardware and Algorithms across Multiple Layers in Wireless Sensor Networks, co-PI, NSF CIF 0910765, September 2009–August 2014, $2,900,000.
- DARPA: Theory and Practice of Analog-to-Information Conversion (Phase II), co-PI, ONR/DARPA N66001-06-1-2011, September 2008–August 2010, $750,000.
- NSF CAREER: Modeling and Analysis of Data from Massive Graphs, sole PI, NSF DMS 0547744, May 2006–April 2011, $400,000.
- DARPA: Theory and Practice of Analog-to-Information Conversion, co-PI, ONR/DARPA N66001-06-1-2011, January 2006–December 2006, $150,000.
- NSF DDDAS-SMRP: Optimizing Signal and Image Processing in a Dynamic, Data-Driven Application System, co-PI, NSF CNS 0540154, January 2006–November 2008, $90,000.
- Elizabeth C. Crosby Research Award, sole PI, University of Michigan, 2005–2006, $20,000.
- FRG: Collaborative research in algorithms for sparse data representation, co-PI, NSF DMS 0354600, September 2004–August 2007, $317,808.

Ph.D. Students

- Zijian Wang, Applied Mathematics PhD Program, Yale University, 2026. (now at Optiver)
- Joon-Hyeok Yim, Department of Mathematics, Yale University, 2025.
- Asaf Etgar, Applied Mathematics PhD Program, Yale University, expected graduation 2027.
- Isay Katsman, Applied Mathematics PhD Program, Yale University, 2026. (now at Two Sigma)
- Rishi Sonthalia, Department of Mathematics, University of Michigan, April 2021. (jointly advised with Raj Rao, University of Michigan.) (now at Boston College)

- Claire Lin, Department of Mathematics, University of Michigan, April 2021. (jointly advised with Jeff Fessler, University of Michigan.)
- Umang Varma, Department of Mathematics, University of Michigan, April 2019. (now at Google)
- Alexander Vargo, Department of Mathematics, University of Michigan, April 2020.
- Audra McMillan, Department of Mathematics, University of Michigan, April 2018. (now at Apple Research)
- Yan-shuo Tan, Department of Mathematics, University of Michigan, April 2018. (jointly advised with Roman Vershynin, University of California-Irvine.)
- Yitong Sun, Department of Mathematics, University of Michigan, August 2019 (expected graduation). (jointly advised with Ambuj Tewari, University of Michigan.) (now at Huawei)
- Jeremy Hoskins, Department of Mathematics, University of Michigan, April 2017. (jointly advised with John Schotland, University of Michigan.) (now at the University of Chicago)
- Paul Shearer, Department of Mathematics, University of Michigan, May 2013.
- Jae Young Park, Department of Electrical Engineering and Computer Science, University of Michigan, May 2013. (now at Apple Research, jointly advised with Michael Wakin, Colorado School of Mines.)
- Praveen Yenduri, Department of Electrical Engineering and Computer Science, University of Michigan, December 2012. (now at MathWorks.)
- Ray Maleh, Department of Mathematics, University of Michigan, August 2009. (now at L3 Communications.)
- Joel Tropp, *Topics in Sparse Approximation*, University of Texas at Austin (joint with Inderjit S. Dhillon, Dept. of Computer Science, UT-Austin), 2004. (now at California Institute of Technology.)

Postdoctoral Fellows

- Kevin O'Neill, Yale University, 2021–2024.
- Howard Levinson, University of Michigan, 2018–2020.
- Lalit Jain, University of Michigan, 2016–2017.
- Brett Hemenway, University of Michigan, 2009–2012.
- Joel Tropp, University of Michigan, 2004–2007.

Undergraduate/REU/UROP/Summer Students Supervised

- Mihai Esanu (Yale University, summer research project), 2025.
- David Gold (Yale University, senior thesis), 2022.
- Stephen Newman (Yale University, senior thesis), 2021.
- Yulan Zhang (Yale University, senior thesis), 2021.
- Justin Shetty and James Wich (Univ. of Michigan, UROP), 2016–2017.
- Yi Wang (Univ. of Michigan, EECS), University of Michigan, 2006.
- Kyle Herrity (Univ. of Michigan, REU), University of Michigan, 2005.
- Daniel Sikora (Univ. of Michigan REU), University of Michigan, 2005.
- Kirill Levchenko (Univ. of California San Diego), AT&T Labs-Research, 2003.
- Joel Tropp (Univ. of Texas), AT&T Labs-Research, 2002.

- Jing Zou (Princeton University), AT&T Labs-Research, 2002.
- Maya Gupta (Stanford University), AT&T Labs-Research, 2000.
- Stephane Seuret (ENST), AT&T Labs-Research, 1999.
- Youngmi Joo (Stanford University), AT&T Labs-Research, 1999.
- Jennifer Steichen (Univ. Illinois), AT&T Labs-Research, 1998.

Courses Taught

- Spring 2026, CPSC 3660, Intensive Algorithms, Department of Computer Science, Yale University.
- Fall 2025, E&CE 2020, Introduction to Communications and Control, Department of Electrical & Computer Engineering, Yale University.
- Spring 2025, CPSC 366, Intensive Algorithms, Department of Computer Science, Yale University.
- Fall 2024, E&CE 202, Introduction to Communications and Control, Department of Electrical & Computer Engineering, Yale University.
- Spring 2024, CPSC 366, Intensive Algorithms, Department of Computer Science, Yale University.
- Spring 2023, Math 752, Topics in Sparse Analysis, Department of Mathematics, Yale University.
- Fall 2022, S&DS 569, Numerical Linear Algebra, Department of Statistics & Data Science, Yale University.
- Spring 2022, Math 421, The Mathematics of Data Science, Department of Mathematics, Yale University.
- Fall 2021, S&DS 431/631, Computation and Optimization, Department of Statistics & Data Science, Yale University.
- Spring 2021, S&DS 431/631, Computation and Optimization, Department of Statistics & Data Science, Yale University.
- Fall 2020, Math 863, Topics in Sparse Analysis, Department of Mathematics, Yale University.
- Winter 2020, Math 651, Mathematical Analysis and Algorithms of Machine Learning, Department of Mathematics, University of Michigan.
- Winter 2019, Math 650, Fourier Analysis, Department of Mathematics, University of Michigan.
- Fall 2018, Math 556, Applied Functional Analysis, Department of Mathematics, University of Michigan.
- Fall 2016, M571, Numerical Linear Algebra, Department of Mathematics, University of Michigan.
- Fall 2016, Math 556, Applied Functional Analysis, Department of Mathematics, University of Michigan.
- Fall 2015, Fall 2015, Math 556, Applied Functional Analysis, Department of Mathematics, University of Michigan.
- Winter 2015, Math 416, Randomized Algorithms, Department of Mathematics, University of Michigan.
- Fall 2014, Math 571, Numerical Linear Algebra, Department of Mathematics, University of Michigan.
- Winter 2014, Math 416, Randomized Algorithms, Department of Mathematics, University of Michigan.
- Fall 2013, Math 556, Applied Functional Analysis, Department of Mathematics, University of Michigan.
- Fall 2012, Math 471, Instroduction to Numerical Methods, Department of Mathematics, University of Michigan.
- Fall 2012, Math 571, Numerical Methods for Scientific Computing I, Department of Mathematics, University of Michigan.

- Winter 2012, Math 651, Sparse Analysis, Department of Mathematics, University of Michigan.
- Fall 2011, Math 571, Numerical Methods for Scientific Computing I, Department of Mathematics, University of Michigan.
- Summer 2011, Short course on Sparse Approximation, Women in Mathematics Program, Institute for Advanced Study.
- Winter 2010, Math 471, Introduction to Numerical Methods, Department of Mathematics, University of Michigan.
- Summer 2010, Short course on Sparse Approximation, Park City Mathematics Institute.
- Fall 2009, Math 571, Numerical Methods for Scientific Computing I, Department of Mathematics, University of Michigan.
- Fall 2008, EECS 598, Compressive Sensing, Division of Electrical and Computer Engineering, University of Michigan.
- Winter 2008, Math 571, Numerical Methods for Scientific Computing I, Department of Mathematics, University of Michigan.
- Fall 2007, Math 471, Introduction to Numerical Methods, Department of Mathematics, University of Michigan.
- Winter 2007, Math 650, Fourier Analysis, Department of Mathematics, University of Michigan.
- Winter 2006, Math 650, Fourier Analysis, Department of Mathematics, University of Michigian.
- Fall 2005, Math 425, Introduction to Probability, Department of Mathematics, University of Michigan.
- Fall 2005, Math 454, Boundary value problems for partial differential equations, Department of Mathematics, University of Michigan.
- Fall 2004, Math 454, Boundary value problems for partial differential equations, Department of Mathematics, University of Michigan.
- Fall 2004, Math 450, Advanced mathematics for engineers, Department of Mathematics, University of Michigan.
- Winter 2000, Time/Frequency analysis, Department of Mathematics, Stanford University.

Patents

- A. Gilbert, Y. Kotidis, S. Muthukrishnan, and M. Strauss, Method and apparatus for using wavelets to produce data summaries, 7,296,014,
  November 13, 2007. Assignee: AT&T Corp.
- A. Gilbert, Y. Kotidis, S. Muthukrishnan, and M. Strauss, Method and apparatus for using wavelets to produce data summaries, 7,272,599,
  September 18, 2007. Assignee: AT&T Corp.
- A. Gilbert, S. Guha, P. Indyk, Y. Kotidis, S. Muthukrishnan, and M. Strauss, Method and apparatus for using histograms to produce data summaries, 7,177,282,
  February 13, 2007. Assignee: AT&T Corp.
- J. Fong, A. Gilbert, S. Kannan, and M. Strauss, Method for Routing Data Using a Fractional Open Shortest Path First Protocol. (Filed.)

Awards

- Awarded SIAM Ralph E. Kleinman Prize, 2013.

- Awarded EURASIP Signal Processing Best Paper award for *Algorithms for simultaneous sparse approximation. Part I: Greedy pursuit*, joint with Joel Tropp and Martin J. Strauss, 2010.
- Awarded Association of Computing Machinery (ACM) Douglas Engelbart Award, 2008.
- Awarded National Academy of Sciences Award for Initiatives in Research, 2008.
- Awarded Alfred P. Sloan Fellowship, 2006–2008.
- Awarded NSF University-Industry Postdoctoral Research Fellowship, 1997-1999.
- Awarded AT&T Foundation Ph.D. Fellowship, 1995-1997.
- Awarded AT&T Foundation Graduate Research Program for Women grant, 1993–1997.
- Awarded National Physical Science Consortium Graduate Fellowship (1993)—declined to attend Princeton University.
- Phi Beta Kappa, May, 1993.

Invited Talks

- Plenary speaker, SIAM New York–New Jersey–Pennsylvania Section meeting, Rutgers University, *Proofs, Errors, and the Future of Mathematical Practice*, October 2026.
- Theory Seminar, University of Michigan, *Metric Repair: Where the problem is tractable, and whether solving it helps*, October 2026.
- Colloquium speaker, IYSE Department, Georgia Tech, November 2025.
- Distinguished Lecture Series, UCLA, Department of Mathematics, June 2025.
- Plenary speaker, Strobl24: More on Harmonic Analysis, Strobl, Austria, June 2024.
- Mathematics Colloquium, University of Washington and PIMS, *Seeing the forest for the trees*, April 2024.
- Joint Colloquium, Computational and Applied Mathematics, Statistics, and the Data Science Institute, University of Chicago, *Project and Forget: Solving Large-Scale Metric Constrained Problems*, November 2023.
- Inaugural AMS von Neumann speaker at the Joint Mathematics Meetings of the AMS, 2022.
- Invited talk at the Mathematics of Complex Data conference, KTH, Sweden, 2022.
- Seminar speaker, NYU Center for Data Science, 2022.
- Applied Mathematics Seminar speaker, Department of Mathematics, UCLA, 2022.
- Alan Goldman Lecture, Department of Applied Mathematics, Johns Hopkins University, 2022.
- Colloquium, Department of Electrical Engineering, Princeton University, 2019.
- Keynote speaker, Workshop on Foundations of Data Science and Applications, Purdue University, 2019.
- Colloquium, Departments of Mathematics and Statistics/Data Science, Yale University, 2018.
- Colloquium, Department of Mathematics, University of Chicago, 2018.
- CBMS Conference on Sparse Approximation and Signal Recovery Algorithms May 22-26, 2017
- IMA Public Lecture, *Group Testing*, March, 2017.
- University of Minnesota Applied Math Colloquium, March, 2017.

- IMA Workshop on Statistical Learning Theory, May, 2016.
- Algebraic and Spectral Graph Theory, BIRS, August, 2016.
- Plenary speaker, Mathematics and Image Analysis, Paris, January, 2016.
- Plenary speaker, Canadian Mathematical Society, Montreal, December, 2015.
- Lectures at summer school on Computational Harmonic Analysis, Univ. of Maryland, July, 2015.
- Plenary speaker, International Biomedical and Astronomical Signal processing (BASP) Frontiers Workshop, Switzerland, December, 2015.
- Speaker, AIM Workshop on implications of the Kadison-Singer proof, California, 2014.
- Invited speaker, Strata+Hadoop industry conference on massive data, New York, 2014.
- Invited speaker, International Congress of Mathematicians, Seoul, Korea, 2014.
- University of Texas at Austin, Distinguished Speaker, Winter 2014.
- Program in Applied and Computational Mathematics Colloquium, Princeton University, 2013.
- Symposium Speaker, National Academies of Science Kavli Frontiers of Science Symposium, Irvine, CA, 2013.
- Boeing Applied Mathematics Seminar, University of Washington, 2013.
- Applied Mathematics Colloquium, University of Colorado-Boulder, 2012.
- AAAS Symposium speaker, Applications of Compressed Sensing, 2013.
- Statistics and Computation Colloquium, University of Chicago, 2012.
- Invited speaker, ICALP 2012 Workshop on Group Testing, 2012.
- Invited speaker, Sensing and Analysis of High Dimensional Data (SAHD), Duke University, 2011.
- Plenary Speaker, Neural Information Processing Systems (NIPS), Granada Spain, December 2011.
- Plenary Speaker, Signal Processing with Adaptive Sparse Structured Representations (SPARS), St. Malo, FRANCE, 2009.
- Applied Mathematics Seminar speaker, Department of Mathematics, Stanford University, October 2008.
- Speaker, Workshop on Sublinear Algorithms, Dagstuhl Germany, August 2008.
- Tutorial Presentation, SIAM Imaging Conference, San Diego, July 2008.
- Speaker, Mining Massive Data Sets, Stanford University, June 2008.
- Michigan Section of the MAA, Plenary talk, May 2008.
- Applied Mathematics Colloquium, Brown University, May 2008.
- Applied Mathematics Seminar, Vanderbilt University, April 2008.
- Applied Mathematics Colloquium, University of Pennsylvania, February 2008.
- Invited Speaker, Information Theory and its Applications (ITA), UC-San Diego, January 2008.
- Applied Mathematics Colloquium, Cornell University, September 2007.
- Speaker, Workshop on Multiscale Methods, Oberwolfach Germany, July 2007.
- Invited speaker, von Neumann Symposium, Park City, Utah, 2007.

- Colloquium speaker, Program in Applied and Computational Mathematics, Princeton University, Princeton, NJ, 2006.
- Invited speaker, Sequences and Codes, IRMACS Centre, Simon Fraser University, Vancouver, BC, 2006.
- Invited speaker, Abel Symposium, Ålesund, Norway, 2006.
- Colloquium speaker, Department of Applied Mathematics, Columbia University, New York, NY, 2006.
- Colloquium speaker, Department of Mathematics, Wayne State University, Detroit, MI, 2006.
- Colloquium speaker, Department of Computer Science, Harvard University, Boston, MA, 2005.
- Colloquium speaker, Departments of Mathematics and Statistics, Boston University, Boston, MA, 2005.
- Invited speaker, Sparse Representation in Redundant Systems Conference, Univ. of Maryland, College Park, MD 2005.
- Invited address, AMS Sectional Meeting, Newark, DE 2005.
- Invited speaker, Multiscale Geometry and Analysis in High Dimensions Conference, IPAM, Los Angeles, CA 2004.
- Plenary speaker, SIAM Annual Conference, San Diego, CA 2001.
- Invited speaker, Session on Internet Research As an Experimental Science, AAAS Annual Meeting, Anaheim, CA, January 1999.
- Invited speaker, SIAM Regional Meeting on Mathematics in Industry, Worcester, MA, May 1998.

Professional Service

- Co-organizer, ICML 2026 Workshop on AI for Physics (AI4Physics), Seoul, South Korea, July 2026; moderator of the panel "AI4Physics and the Future AI Revolution."
- Executive committee member for the Miller Institute for Basic Research in Science at UC-Berkeley, 2022–present.
- Board of Trustees member at the Institute for Computational and Experimental Mathematics (ICERM) at Brown University, 2022–present.
- Graduate admissions, Department of Statistics & Data Science, Yale University, 2022–2023.
- Member of Wu Tsai Institute for Neuroscience steering committee, Yale University, 2021–2023.
- Member of SEAS Strategic Planning Committee, Yale University, 2020–2021.
- Hiring Committee, Department of Statistics & Data Science, Yale University, 2020–2021.
- Graduate Admissions, Department of Mathematics and Program in Applied Mathematics, Yale University, 2021–present.
- Graduate Admissions, Department of Mathematics, University of Michigan, 2017–2020.
- Program Committee Member, Random/Approx Conference, 2017.
- Member of Alfred P. Sloan Fellowship Selection Committee 2016—2022.
- Co-organizer of Park City Mathematics Institue Summer 2016 program on the Mathematics of Information.
- Chair of Personnel Committee, Department of Mathematics, University of Michigan, 2015–2017.
- Core Member of Michigan Institute for Data Science and Chair of Faculty Recruiting Committee, 2015–2017.

- Co-organizer of workshop at Foundations of Computer Science (FOCS) 2014 on Sparse Fourier Transform.
- IMA Prize Committee member, 2014-2019.
- AWM Sadosky Prize Committee member, 2015–2017.
- Co-organized Midwest Theory Day (held at University of Michigan), 2014.
- Member of the Scientific Advisory Board of ICERM at Brown University 2014–2017, Chair (2015–2017).
- NSF DMS Panel Member, 2013.
- Organizing Committee on Training Students to Extract Value from Big Data, National Research Council, 2013-2014.
- Personnel Committee, Department of Mathematics, University of Michigan, 2012–2019.
- Natural Sciences Divisional Evaluation Committee, University of Michigan, 2012–2015.
- ACM Symposium on Theory of Computing (STOC) 2013 technical program committee member, 2012.
- Member of external review committee for MSRI, March 2013.
- Vienna Science and Technology Fund Reviewer for "Mathematics and..." Young Investigator Award, 2012.
- NSF CCF Panel Member, 2011.
- Committee on the Analysis of Massive Data, National Research Council, 2010-2011.
- Program Committee, Symposium on Discrete Algorithms (SODA) 2011.
- Program Committee, Foundations of Computer Science (FOCS) 2009.
- Fellow in the (Center for Research in Learning and Teaching) CRLT Colloquium on the Science of Learning for 2009-2010.
- Personnel Committee, Department of Mathematics, University of Michigan, 2008–2010.
- Graduate Admissions, Department of Mathematics, University of Michigan, 2007–2009, 2011–2012.
- Board of Governors, Institute of Mathematics and its Applications (IMA), University of Minnesota, 2006-2011, chair 2011.
- Steering Committee, Informatics Undergraduate Degree Program, University of Michigan, 2006–2009.
- Executive Committee, Department of Mathematics, University of Michigan, 2005–2006.
- Computing Committee, Department of Mathematics, University of Michigan, 2004–2005.
- Applied and Interdisciplinary Mathematics (AIM) Graduate Committee University of Michigan, 2004–2005.
- Served on AT&T Labs Fellowship Program committee, 2002–2004.
- Initiated AT&T Shannon Postdoctoral Fellowship and chaired search committee, 2000-2001.

Editorial Service

- Associate editor for *Pure and Applied Analysis, 2018–present.*
- Associate editor for *Theory of Computing Systems*, 2010–present.
- Associate editor for *Applied and Computational Harmonic Analysis*, 2010–2013.

- Associate editor for *SIAM Multiscale Modeling*, 2008–2011.
- Associate editor for *Communications in Mathematical Sciences*, 2006–2009.
- Program committee for mini-symposia at ICIAM, Syndey, Australia, 2003.
- Referee for *IEEE Trans. on Information Theory*, *IEEE Trans. on Networking*, *IEEE Trans. on Signal Processing*, *SIAM Journal on Applied Mathematics*, *EURASIP Journal of Signal Processing*.

Popular press

- Barry Cipra, Oh, What a Tangled Web We've Woven..., *SIAM News*, vol. 33, no. 2, 2000.
- Barry Cipra, Sublinear Computing: When Ignorance is Bliss, *SIAM News*, vol. 37, no. 3, 2004.