

MARK A. DAVENPORT

Georgia Institute of Technology
School of Electrical and Computer Engineering
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EDUCATION

PhD in Electrical and Computer Engineering

Rice University, December 2010

Advisor: Dr. Richard Baraniuk

Thesis: “Random observations on random observations: Sparse signal acquisition and processing”

Winner of Budd Award for Best Thesis in School of Engineering

MS in Electrical and Computer Engineering

Rice University, May 2007

Advisor: Dr. Richard Baraniuk

Thesis: “Error control for support vector machines”

BSEE in Electrical and Computer Engineering, *cum laude*

Rice University, May 2004

BA in Managerial Studies, *cum laude*

Rice University, May 2004

ACADEMIC POSITIONS

Professor of Electrical and Computer Engineering

School of Electrical and Computer Engineering, Georgia Institute of Technology, 2022–present

Associate Professor of Electrical and Computer Engineering

School of Electrical and Computer Engineering, Georgia Institute of Technology, 2017–2022

Assistant Professor of Electrical and Computer Engineering

School of Electrical and Computer Engineering, Georgia Institute of Technology, 2012–2017

NSF Mathematical Sciences Postdoctoral Research Fellow

Statistics Department, Stanford University, 2010–2012

VISITING POSITIONS

Texas Instruments Visiting Professor

Electrical and Computer Engineering, Rice University, 2020

Research Visitor

Laboratoire Jacques-Louis Lions, Université Pierre et Marie Curie, 2011

CONSULTING AND INDUSTRIAL EXPERIENCE

Data Science and Machine Learning Advisor, Mogean, Inc., 2016–present
Technical Consultant, Qualcomm, Inc., 2013–2015
Technical Consultant, HRL, 2013–2015
Technical Consultant, Fulbright and Jaworsky, LLP, 2004–2005
Software Engineer, ViaSat, Inc., 2004

SELECTED HONORS AND RESEARCH AWARDS

Georgia Tech Pi Mile Road Race, Fastest Male Faculty Member, 2022
Outstanding Young Engineering Alumni, George R. Brown School of Engineering, Rice University, 2020
Outstanding Junior Faculty Member, Electrical and Computer Engineering, Georgia Tech, 2020
Presidential Early Career Award for Scientists and Engineers (PECASE), 2019
Sloan Research Fellowship, 2017
AFOSR Young Investigator Award, 2014
NSF CAREER Award, 2014
NSF Mathematical Sciences Postdoctoral Research Fellowship, 2010
Hershel M. Rich Outstanding Invention Award, 2007
NSF Graduate Fellowship Honorable Mention, 2005
Texas Instruments Graduate Fellowship, 2004–2005
Best Senior Project Award, ECE Department, Rice University, 2004
Tau Beta Pi, 2004
Eta Kappa Nu, 2003
L. J. Walsh Scholarship, 2001–2004

BEST PAPER AWARDS

IEEE SPS Signal Processing Magazine Best Paper Award, 2020
For: *“Single-pixel imaging via compressive sampling,”* by M. Duarte, M. Davenport, D. Takhar, J. Laska, T. Sun, K. Kelly, and R. Baraniuk.
Sampling Theory and its Applications (SampTA) Best Student Paper Award, 2019
For: *“Fast multitaper spectral estimation,”* by S. Karnik, J. Romberg, and M. Davenport.
IEEE Signal Processing Society Best Paper Award, 2015
For: *“Signal processing with compressive measurements,”* by M. Davenport, P. Boufounos, M. Wakin, and R. Baraniuk.
Information and Inference Best Paper Prize Finalist, 2015
For: *“1-bit matrix completion,”* by M. Davenport, Y. Plan, E. van den Berg, and M. Wootters.
Ralph Budd Award for Best Thesis in the School of Engineering at Rice University, 2011
For: *“Random observations on random observations: Sparse signal acquisition and processing,”* Ph.D. Thesis, M. Davenport.

TEACHING AWARDS

Richard M. Bass Outstanding Teacher Award, 2015, 2022
CETL “Thank a Teacher” Certificate, 2019, 2020, 2021
Class of 1940 W. Roane Beard Outstanding Teacher Award, 2017
CETL/BP Junior Faculty Teaching Excellence Award, 2016
Lockheed Dean’s Excellence in Teaching Award, 2015
Georgia Institute of Technology Class of 1969 Teaching Fellow, 2014–2015
LexisNexis Dean’s Excellence Award, 2014
Georgia Institute of Technology Class of 1940 Teaching Effectiveness Award, 2013
Teaching Fellowship, ECE Department, Rice University, 2006–2007

COURSES TAUGHT

Introduction to Signal Processing

ECE 2026, Georgia Institute of Technology
Spring 2023, Fall 2014, Fall 2012

Statistical Machine Learning

ECE 6254, Georgia Institute of Technology
Spring 2022, Spring 2017, Spring 2015, Spring 2014

Optimization for Information Systems

ECE 3803, Georgia Institute of Technology
Fall 2021

Convex Optimization: Theory, Algorithms, and Applications

ECE 6270, Georgia Institute of Technology
Spring 2019, 2021

Mathematical Foundations of Data Science

ECE 4803, Georgia Institute of Technology
Fall 2020

Advanced Digital Signal Processing

ECE 6250, Georgia Institute of Technology
Fall 2019, Fall 2018, Fall 2017

Introduction to Probability and Statistics for ECEs

ECE 3077, Georgia Institute of Technology
Summer 2016, Fall 2015, Summer 2013

Harmonic Analysis for Signal Processing

ECE 8823a, Georgia Institute of Technology
Spring 2013

Digital Signal Processing

ELEC 431, Rice University
Spring 2010

STUDENT SUPERVISION AND ADVISING

PhD Students

Peimeng Guan, 2021–present

Topic: Machine learning for inverse problems

Yuqin Yang, 2021–present

Topic: Causal explanations in machine learning

Christopher Hood, 2020–present

Topic: Machine learning for far-field characterization of antenna arrays

Charles Topliff, 2019–present

Topic: Forecasting and inverse problems in space weather

Co-advised with Morris Cohen

NDSEG Graduate Fellowship

Austin Xu, 2019–present

Topic: Learning metrics and embeddings from similarity queries

ML@GT Fellowship

Namrata Nadagouda, 2018–present

Topic: Building data efficient models using active learning and similarity comparisons

Nauman Ahad, 2017–present

Topic: Change detection for time series analysis and machine learning

Niranjana Kannabiran, 2016–present

Thesis: Teaching robots to learn about objects by interaction

Co-advised with Irfan Essa

Andrew McRae, 2018–2022

Topic: Structured statistical estimation via optimization

ARC-TRIAD Student Fellowship

Now at École Polytechnique Fédérale de Lausanne

Matthew R. O’Shaughnessy, 2016–2021

Topic: Structure and causality in understanding complex systems

Co-advised with Christopher Rozell

NDSEG Graduate Fellowship

Now at Carnegie Endowment for International Peace

Santhosh Karnik, 2015–2021

Thesis: Fast algorithms for sampled multiband signals

Now at Michigan State University

Chieh-Feng Cheng, 2015–2019

Thesis: Audio classification and event detection based on small-size weakly labelled data

Co-advised with David Anderson

Now at Advantech

Liangbei Xu, 2014–2019

Thesis: Dynamic low-rank matrix recovery: Theory and applications

Andrew K. Massimino, 2012–2018

Thesis: Learning to adapt under practical sensing constraints

Algorithms and Randomness Center (ARC) Student Fellowship

Now at Amazon Web Services

Michael G. Moore, 2012–2018

Thesis: Maximum likelihood estimation of Poisson and Hawkes processes and extensions to Hawkes process analysis

Now at Numerica Corporation

Hongteng Xu, 2013–2017

Thesis: Point process-based modeling and analysis of asynchronous event sequences

Co-advised with Hongyuan Zha

Now faculty at Renmin University of China

Selected Undergraduate Students

Austin J. Little, 2016–2018

Topic: Real-time activity tracking for wheelchair users

Opportunity Research Scholars (ORS) Best Presentation Award

Matthew R. O’Shaughnessy, 2014–2016

Topic: Algorithms for nonmetric triangulation and multidimensional scaling

President’s Undergraduate Research Award (PURA)

RESEARCH SUPPORT

National Science Foundation

Design principles and theory for data augmentation (2022 – 2025)

Lockheed Martin

Foveating Slepian beamforming with AI/ML control (2022)

National Science Foundation

Bridging statistical hypothesis tests and deep learning for reliability and computational efficiency (2022 – 2024)

Center for Energy and Geo Processing

A machine learning end-to-end framework for robust acquisition and processing of seismic data (2021 – 2024)

National Science Foundation

Learning, refining, and understanding models through relational feedback (2021 – 2023)

Defense Advanced Research Projects Agency

Active similarity learning and manifold graphs for learning with few labels (2019 – 2022)

Coulter Foundation

Wheelchair activity tracker (2018 – 2019)

National Institute of Health

Development of technologies to increase in-seat movement to prevent sitting-acquired injuries in wheelchair users (2017 – 2022)

Alfred P. Sloan Foundation, Sloan Research Fellowship

From measurements to information: Exploiting the structure in data (2017 – 2021)

Lockheed Martin

Compressive beamforming (2017 – 2021)

National Science Foundation, Division of Civil, Mechanical, and Manufacturing Innovation

An audio-based spatiotemporal system for automated monitoring of construction operations (2015 – 2019)

IERUS Technologies

Compressive sensing for radar discrimination (2015 – 2016)

National Science Foundation, Division of Computer and Communication Foundations

Subspace matching on the continuum (2014 – 2018)

Air Force Office of Scientific Research, Young Investigator Program

Solving inference and inverse problems using soft data (2014 – 2017)

National Science Foundation, Division of Computer and Communication Foundations

CAREER: Learning from coarse, nonmetric, and incomplete data (2014 – 2019)

Naval Research Laboratory

Detecting anomalous signals via low-dimensional geometry (2013 – 2017)

National Science Foundation, Division of Mathematical Sciences

Mathematical Sciences Postdoctoral Research Fellowship (2010 – 2012)

BOOKS AND BOOK CHAPTERS

M. A. Davenport, M. F. Duarte, Y. C. Eldar, and G. Kutyniok, “Introduction to compressed sensing,” in *Compressed Sensing: Theory and Applications*, Cambridge University Press, 2012.

[amzn.to/KdvNIW]

R. G. Baraniuk, M. A. Davenport, M. F. Duarte, and C. Hegde. *An Introduction to Compressive Sensing*. Connexions e-textbook, 2011. [cnx.org/content/col11133]

JOURNAL PUBLICATIONS

A. D. McRae, J. Romberg, and M. A. Davenport. “Optimal convex lifted sparse phase retrieval and PCA with an atomic matrix norm regularizer,” to appear in *IEEE Trans. on Information Theory*, 2023.

M. R. O’Shaughnessy, D. S. Schiff, L. R. Varshney, C. J. Rozell, and M. A. Davenport, “What governs attitudes toward artificial intelligence adoption and governance?” to appear in *Science and Public Policy*, 2023.

N. Ahad, M. A. Davenport, and Y. Xie, “Data-adaptive symmetric CUSUM for sequential change detection,” Preprint, October 2022.

C. DeLude, R. S. Sharma, S. Karnik, C. Hood, M. A. Davenport, and J. Romberg, “Iterative broadband source localization,” Preprint, October 2022.

- P. Guan, J. Jin, J. Romberg, and M. A. Davenport, "Loop unrolled shallow equilibrium regularizer (LUSER): A memory-efficient inverse problem solver," *Preprint*, October 2022.
- N. Ahad, S. E. Sonenblum, M. A. Davenport, and S. Sprigle, "Validating a wheelchair in-seat activity tracker," *Assistive Technology*, 34(5), pp. 588–598, October 2022.
- S. Karnik, J. Romberg, and M. A. Davenport, "Thomson's multitaper method revisited," *IEEE Trans. on Information Theory*, 68(7), pp. 4864–4891, July 2022.
- C. DeLude, S. Karnik, M. A. Davenport, and J. Romberg, "Broadband beamforming via linear embedding," *Preprint*, June 2022.
- N. Ahad, E. L. Dyer, K. B. Hengen, Y. Xie, and M. A. Davenport, "Learning Sinkhorn divergences for supervised change point detection," *Preprint*, February 2022.
- N. Nadagouda, A. Xu, and M. A. Davenport, "Active metric learning and classification using similarity queries," *Preprint*, February 2022.
- S. Karnik, J. Romberg, and M. A. Davenport, "Improved bounds for the eigenvalues of discrete prolate spheroidal wave functions and discrete prolate spheroidal sequences," *Applied and Computational Harmonic Analysis*, 55, pp. 97–128, November 2021.
- A. K. Massimino and M. A. Davenport, "As you like it: Localization via paired comparisons," *J. of Machine Learning Research*, 22(186), pp. 1–39, 2021.
- A. D. McRae and M. A. Davenport, "Low-rank matrix completion and denoising under Poisson noise," *Information and Inference*, 10(2), pp. 697–720, June 2021.
- R. S. Srinivasa, M. A. Davenport, and J. Romberg, "Trading beams for bandwidth: Imaging with randomized beamforming," *SIAM J. on Imaging Sciences*, 13(1), pp. 317–350, 2020.
- M. R. O'Shaughnessy, M. A. Davenport, and C. J. Rozell, "Sparse Bayesian learning with dynamic filtering for inference of time-varying sparse signals," *IEEE Trans. on Signal Processing*, 68, pp. 388–403, 2020.
- C. Sabillon, A. Rashidi, B. Samanta, M. A. Davenport, and D. V. Anderson, "Audio-based Bayesian model for productivity estimation of cyclic construction activities," *J. of Computing in Civil Engineering*, 34(1), pp. 04019048, January 2020.
- C.-F. Cheng, A. Rashidi, M. A. Davenport, and D. V. Anderson, "Evaluation of software and hardware settings for audio-based analysis of construction operations," *Int. J. of Civil Engineering*, 17(9), pp. 1469–1480, September 2019.
- M. G. Moore and M. A. Davenport, "Estimation of Poisson arrival processes under linear models," *IEEE Trans. on Information Theory*, 65(6), pp. 3555–3564, June 2019.
- S. Karnik, Z. Zhu, M. B. Wakin, J. Romberg, and M. A. Davenport, "The Fast Slepian Transform," *Applied and Computational Harmonic Analysis*, 46(3), pp. 624–652, May 2019.
- Z. Zhu, S. Karnik, M. B. Wakin, M. A. Davenport, and J. Romberg, "ROAST: Rapid Orthogonal Approximate Slepian Transform," *IEEE Trans. on Signal Processing*, 66(22), pp. 5887–5901, November 2018.
- H. Xu, L. Yu, M. A. Davenport, and H. Zha, "Active manifold learning via a unified framework for manifold landmarking," *IEEE Trans. on Signal Processing*, 66(21), pp. 5563–5576, November 2018.
- Z. Zhu, S. Karnik, M. A. Davenport, J. Romberg, and M. B. Wakin, "The eigenvalue distribution of discrete periodic time-frequency limiting operators," *IEEE Signal Processing Letters*, 25(1), pp. 95–99, January 2018.
- C.-F. Cheng, A. Rashidi, M. A. Davenport, and D. V. Anderson, "Activity analysis of construction equipment using audio signals and support vector machines," *Automation in Construction*, 81, pp. 240–253, September 2017.

- M. A. Davenport, A. K. Massimino, D. Needell, and T. Woolf, "Constrained adaptive sensing," *IEEE Trans. on Signal Processing*, 64(20), pp. 5437–5449, October 2016.
- M. A. Davenport and J. Romberg, "An overview of low-rank matrix recovery from incomplete observations," *IEEE J. of Selected Topics in Signal Processing*, 10(4), pp. 608–622, June 2016.
- M. A. Davenport, Y. Plan, E. van den Berg, and M. Wootters, "1-bit matrix completion," *Information and Inference*, 3(3), pp. 189–223, September 2014.
- Finalist for Information and Inference Best Paper Prize**
- R. Willett, M. F. Duarte, M. A. Davenport, and R. G. Baraniuk, "Sparsity and structure in hyperspectral imaging: Sensing, reconstruction, and target detection," *IEEE Signal Processing Magazine*, 31(1), pp. 116–126, January 2014.
- A. Cohen, M. A. Davenport, and D. Leviatan, "On the stability and accuracy of least squares approximations," *Foundations of Computational Mathematics*, 13(5), pp. 819–834, October 2013.
- M. A. Davenport, D. Needell, and M. B. Wakin, "Signal space CoSaMP for sparse recovery with redundant dictionaries," *IEEE Trans. on Information Theory*, 59(10), pp. 6820–6829, October 2013.
- E. J. Candès and M. A. Davenport, "How well can we estimate a sparse vector?" *Applied and Computational Harmonic Analysis*, 34(2), pp. 317–323, March 2013.
- E. Arias-Castro, E. J. Candès, and M. A. Davenport, "On the fundamental limits of adaptive sensing," *IEEE Trans. on Information Theory*, 59(1), pp. 472–481, January 2013.
- M. A. Davenport and M. B. Wakin, "Compressive sensing of analog signals using discrete prolate spheroidal sequences," *Applied and Computational Harmonic Analysis*, 33(3), pp. 438–472, November 2012.
- M. A. Davenport, J. N. Laska, J. R. Treichler, and R. G. Baraniuk, "The pros and cons of compressive sensing for wideband signal acquisition: Noise folding vs. dynamic range," *IEEE Trans. on Signal Processing*, 60(9) pp. 4628–4642, September 2012.
- J. N. Laska, P. T. Boufounos, M. A. Davenport, and R. G. Baraniuk, "Democracy in action: Quantization, saturation, and compressive sensing," *Applied and Computational Harmonic Analysis*, 31(3) pp. 429–443, November 2011.
- M. A. Davenport, C. Hegde, M. F. Duarte, and R. G. Baraniuk, "Joint manifolds for data fusion," *IEEE Trans. on Image Processing*, 19(10) pp. 2580–2594, October 2010.
- M. A. Davenport, R. G. Baraniuk, and C. D. Scott, "Tuning support vector machines for minimax and Neyman-Pearson classification," *IEEE Trans. on Pattern Analysis and Machine Intelligence*, 32(10) pp. 1888–1898, October 2010.
- M. A. Davenport and M. B. Wakin, "Analysis of orthogonal matching pursuit using the restricted isometry property," *IEEE Trans. on Information Theory*, 56(9) pp. 4395–4401, September 2010.
- M. A. Davenport, P. T. Boufounos, M. B. Wakin, and R. G. Baraniuk, "Signal processing with compressive measurements," *IEEE J. of Selected Topics in Signal Processing*, 4(2) pp. 445–460, April 2010.
- Winner of IEEE Signal Processing Society Best Paper Award**
- R. G. Baraniuk, M. A. Davenport, R. A. DeVore, and M. B. Wakin, "A simple proof of the restricted isometry property for random matrices," *Constructive Approximation*, 28(3) pp. 253–263, December 2008.
- M. F. Duarte, M. A. Davenport, D. Takhar, J. N. Laska, T. Sun, K. F. Kelly, and R. G. Baraniuk, "Single-pixel imaging via compressive sampling," *IEEE Signal Processing Magazine*, 25(2) pp. 83–91, March 2008.
- Winner of IEEE SPS Signal Processing Magazine Best Paper Award**
- C. D. Scott and M. A. Davenport, "Regression level set estimation via cost-sensitive classification," *IEEE Trans. on Signal Processing*, 55(6) pp. 2752–2757, June 2007.

CONFERENCE PUBLICATIONS

- A. D. McRae, A. Xu, J. Jin, N. Nadagouda, N. Ahad, P. Guan, S. Karnik, and M. A. Davenport, "Delta distancing: A lifting approach to localizing items from user comparisons," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Singapore, May 2022.
- A. D. McRae, S. Karnik, M. A. Davenport, and V. Muthukumar, "Harmless interpolation in regression and classification with structured features," in *Proc. Int. Conf. on Artificial Intelligence and Statistics (AISTATS)*, Online, March 2022.
- F. Zhu, A. R. Sedler, H. A. Grier, N. Ahad, M. A. Davenport, M. T. Kaufman, A. Giovannucci, and C. Pandarinath, "Deep inference of latent dynamics with spatio-temporal super-resolution using selective backpropagation through time," in *Proc. Conf. on Neural Information Processing Systems (NeurIPS)*, Online, December 2021.
- N. Nadagouda and M. A. Davenport, "Switched Hawkes processes," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Online, June 2021.
- N. Ahad and M. A. Davenport, "Semi-supervised sequence classification through change point detection," in *Proc. AAAI Conf. on Artificial Intelligence (AAAI-21)*, Online, January 2021.
- A. Xu and M. A. Davenport, "Simultaneous preference and metric learning from paired comparisons," in *Proc. Conf. on Neural Information Processing Systems (NeurIPS)*, Online, December 2020.
- Spotlight Presentation**
- A. D. McRae, J. Romberg, and M. A. Davenport, "Sample complexity and effective dimension for regression on manifolds," in *Proc. Conf. on Neural Information Processing Systems (NeurIPS)*, Online, December 2020.
- M. O'Shaughnessy, G. Canal, M. Connor, M. A. Davenport, and C. J. Rozell, "Generative casual explanations of black-box classifiers," in *Proc. Conf. on Neural Information Processing Systems (NeurIPS)*, Online, December 2020.
- R. S. Srinivasa, M. A. Davenport, and J. Romberg, "Sample complexity bounds for localized sketching," in *Proc. Int. Conf. on Artificial Intelligence and Statistics (AISTATS)*, Online, August 2020.
- G. Canal, M. Connor, J. Jin, N. Nadagouda, M. O'Shaughnessy, C. J. Rozell, and M. A. Davenport, "The PICASSO algorithm for Bayesian localization via paired comparisons in a union of subspaces model," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Online, May 2020.
- G. H. Canal, M. R. O'Shaughnessy, C. J. Rozell, and M. A. Davenport, "Joint estimation of trajectory and dynamics from paired comparisons," in *Proc. IEEE Int. Work. on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Le Gosier, Guadeloupe, December 2019.
- M. R. O'Shaughnessy, M. A. Davenport, and C. J. Rozell, "Dynamical system implementations of Sparse Bayesian Learning," in *Proc. IEEE Int. Work. on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Le Gosier, Guadeloupe, December 2019.
- S. Karnik, J. Romberg, and M. A. Davenport, "Fast multitaper spectral estimation," in *Proc. Sampling Theory and its Applications (SampTA)*, Bordeaux, France, July 2019.
- Winner of Best Student Paper Award**
- G. H. Canal, A. K. Massimino, M. A. Davenport, and C. J. Rozell, "Active embedding search via noisy paired comparisons," in *Proc. Int. Conf. on Machine Learning (ICML)*, Long Beach, California, June 2019.
- R. S. Srinivasa, M. A. Davenport, and J. Romberg, "Localized random projections with applications to coherent array imaging," in *Proc. Allerton Conf. on Communication, Control, and Computing*, Allerton, Illinois, October 2018.

- T. J. LaGrow, M. G. Moore, J. A. Prasad, M. A. Davenport, and E. L. Dyer, "Approximating cellular densities from high-resolution neuroanatomical imaging data," in *Proc. IEEE Int. Engineering in Medicine and Biology Conf. (EMBC)*, Honolulu, Hawaii, July 2018.
- C.-F. Cheng, D. V. Anderson, M. A. Davenport, and A. Rashidi, "Audio classification on weakly labeled data," in *Proc. IEEE Work. on Statistical Signal Processing*, Freiburg, Germany, June 2018.
- C. A. Sabillon, A. Rashidi, B. Samanta, C. F. Cheng, M. A. Davenport, and D. V. Anderson, "A productivity forecasting system for construction cyclic operations using audio signals and a Bayesian approach," in *Proc. Construction Research Congress (CRC)*, New Orleans, Louisiana, April 2018.
- L. Xu and M. A. Davenport, "Simultaneous recovery of a series of low-rank matrices by locally weighted matrix smoothing," in *IEEE Int. Work. on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Curaçao, Dutch Antilles, December 2017.
- C. F. Cheng, A. Rashidi, M. A. Davenport, D. V. Anderson, and C. A. Sabillon, "Hardware and software requirements for acoustical monitoring of construction jobsites," in *Proc. Int. Work. On Computing in Civil Engineering (IWCCE)*, Seattle, Washington, June 2017.
- A. K. Massimino and M. A. Davenport, "The geometry of random paired comparisons," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, New Orleans, Louisiana, March 2017.
- Z. Zhu, S. Karnik, M. B. Wakin, M. A. Davenport, and J. Romberg, "Fast orthogonal approximations of sampled sinusoids and bandlimited signals," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, New Orleans, Louisiana, March 2017.
- S. Karnik, Z. Zhu, M. B. Wakin, J. K. Romberg, and M. A. Davenport, "Fast computations for approximation and compression in Slepian spaces," in *Proc. IEEE. Global Conf. on Signal and Information Processing (GlobalSIP)*, Washington D. C., December 2016.
- L. Xu and M. A. Davenport, "Dynamic matrix recovery from incomplete observations under an exact low-rank constraint," in *Proc. Advances in Neural Information Processing Systems (NeurIPS)*, Barcelona, Spain, December 2016.
- M. R. O'Shaughnessy and M. A. Davenport, "Localizing users and items from paired comparisons," in *Proc. IEEE Int. Work. on Machine Learning for Signal Processing (MLSP)*, Vietri sul Mare, Salerno, Italy, September 2016.
- M. G. Moore and M. A. Davenport, "Analysis of wireless networks using Hawkes processes," in *Proc. IEEE Int. Work. on Signal Processing Advances in Wireless Communications (SPAWC)*, Edinburgh, Scotland, July 2016.
- C-F. Cheng, A. Rashidi, M. A. Davenport, and D. Anderson, "Audio signal processing for activity recognition of construction heavy equipment," in *Proc. Int. Symp. on Automation and Robotics in Construction (ISARC)*, Auburn, Alabama, July 2016.
- A. K. Massimino and M. A. Davenport, "Binary stable embedding via paired comparisons," in *Proc. IEEE Work. on Statistical Signal Processing (SSP)*, Palma de Mallorca, Spain, June 2016.
- M. G. Moore and M. A. Davenport, "A Hawkes' eye view of network information flow," in *Proc. IEEE Work. on Statistical Signal Processing (SSP)*, Palma de Mallorca, Spain, June 2016.
- M. G. Moore, A. K. Massimino, and M. A. Davenport, "Randomized multi-pulse time-of-flight mass spectrometry," in *Proc. IEEE Int. Work. on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Cancun, Mexico, December 2015.
- H. Xu, H. Zha, and M. A. Davenport, "Active manifold learning via Gershgorin circle guided sample selection," in *Proc. AAAI Conf. on Artificial Intelligence (AAAI-15)*, Austin, Texas, January 2015.
- H. Xu, H. Zha, and M. A. Davenport, "Manifold based dynamic texture synthesis from extremely few samples," in *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, Columbus, Ohio, June 2014.

- M. A. Davenport, "Lost without a compass: Nonmetric triangulation and landmark multidimensional scaling," in *Proc. IEEE Int. Work. on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Saint Martin, December 2013.
- M. Wootters, Y. Plan, M. A. Davenport, and E. van den Berg, "Lower bounds for quantized matrix completion," in *Proc. IEEE Int. Symp. on Information Theory (ISIT)*, Istanbul, Turkey, July 2013.
- A. Charles, A. Ahmed, A. Joshi, S. Conover, C. Turnes, and M. A. Davenport, "Cleaning up toxic waste: Removing nefarious contributions to recommendation systems," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Vancouver, Canada, May 2013.
- M. A. Davenport, D. Needell, and M. B. Wakin, "CoSaMP with redundant dictionaries," in *Proc. 46th Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 2012.
- M. A. Davenport and E. Arias-Castro, "Compressive binary search," in *Proc. IEEE Int. Symp. on Information Theory (ISIT)*, Cambridge, Massachusetts, July 2012.
- S. R. Schnelle, J. P. Slavinsky, P. T. Boufounos, M. A. Davenport, and R. G. Baraniuk, "A compressive phase-locked loop," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Kyoto, Japan, March 2012.
- L. Xu, M. A. Davenport, M. A. Turner, T. Sun, and K. F. Kelly, "Compressive Echelle spectroscopy," in *Proc. Unconventional Imaging and Wavefront Sensing VII at SPIE Optics & Photonics*, San Diego, California, August 2011.
- J. R. Treichler, M. A. Davenport, J. N. Laska, and R. G. Baraniuk, "Dynamic range and compressive sensing acquisition receivers," in *Proc. 7th U.S. / Australia Joint Work. on Defense Applications of Signal Processing (DASP)*, Coolum, Australia, July 2011.
- J. P. Slavinsky, J. N. Laska, M. A. Davenport, and R. G. Baraniuk, "The compressive multiplexer for multi-channel compressive sensing," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Prague, Czech Republic, May 2011.
- M. A. Davenport, C. Hegde, M. F. Duarte, and R. G. Baraniuk, "High-dimensional data fusion via joint manifold learning," in *Proc. AAAI Fall 2010 Symp. on Manifold Learning*, Arlington, Virginia, November 2010.
- M. A. Davenport, S. R. Schnelle, J. P. Slavinsky, R. G. Baraniuk, M. B. Wakin, and P. T. Boufounos, "A wideband compressive radio receiver," in *Proc. Military Communications Conf. (MILCOM)*, San Jose, California, October 2010.
- S. R. Schnelle, J. N. Laska, C. Hegde, M. F. Duarte, M. A. Davenport, and R. G. Baraniuk, "Texas Hold 'Em algorithms for distributed compressive sensing," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Dallas, Texas, March 2010.
- M. A. Davenport and R. G. Baraniuk, "Sparse geodesic paths," in *Proc. AAAI Fall 2009 Symp. on Manifold Learning*, Arlington, Virginia, November 2009.
- J. N. Laska, M. A. Davenport, and R. G. Baraniuk, "Exact signal recovery from sparsely corrupted measurements through the pursuit of justice," in *Proc. 43rd Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 2009.
- J. R. Treichler, M. A. Davenport, and R. G. Baraniuk, "Application of compressive sensing to the design of wideband signal acquisition receivers," in *Proc. 6th U.S. / Australia Joint Work. on Defense Applications of Signal Processing (DASP)*, Lihue, Hawaii, September 2009.
- M. A. Davenport, P. T. Boufounos, and R. G. Baraniuk, "Compressive domain interference cancellation," in *Proc. Workshop on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Saint-Malo, France, April 2009.

- M. F. Duarte, M. A. Davenport, M. B. Wakin, J. N. Laska, D. Takhar, K. F. Kelly, and R. G. Baraniuk, "Multiscale random projections for compressive classification," in *Proc. IEEE Int. Conf. on Image Processing (ICIP)*, San Antonio, Texas, September 2007.
- M. A. Davenport, R. G. Baraniuk, and C. D. Scott, "Minimax support vector machines," in *Proc. IEEE Work. on Statistical Signal Processing (SSP)*, Madison, Wisconsin, August 2007.
- M. A. Davenport, M. F. Duarte, M. B. Wakin, J. N. Laska, D. Takhar, K. F. Kelly, and R. G. Baraniuk, "The smashed filter for compressive classification and target recognition," in *Proc. Computational Imaging V at SPIE Electronic Imaging*, San Jose, California, January 2007.
- M. A. Davenport, R. G. Baraniuk, and C. D. Scott, "Learning minimum volume sets with support vector machines," in *Proc. IEEE Int. Work. on Machine Learning for Signal Processing (MLSP)*, Maynooth, Ireland, September 2006.
- M. A. Davenport, R. G. Baraniuk, and C. D. Scott, "Controlling false alarms with support vector machines," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Toulouse, France, May 2006.
- M. F. Duarte, M. A. Davenport, M. B. Wakin, and R. G. Baraniuk, "Sparse signal detection from incoherent projections," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Toulouse, France, May 2006.

CONFERENCE ABSTRACTS

- N. Nadagouda, A. Xu, and M. A. Davenport, "Active metric learning and classification using similarity queries," *NeurIPS Work. on Human in the Loop Learning (HILL)*, New Orleans, Louisiana, December 2022.
- P. Guan, J. Jin, J. Romberg, and M. A. Davenport, "Loop unrolled shallow equilibrium regularizer (LUSER): A memory-efficient inverse problem solver," *NeurIPS Work. on AI for Science*, December New Orleans, Louisiana, 2022.
- A. McRae and M. A. Davenport, "Low-rank matrix completion and denoising under Poisson noise," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Toulouse, France, July 2019.
- Finalist for Best Student Paper Award**
- M. R. O'Shaughnessy, M. A. Davenport, and C. J. Rozell, "Robust incorporation of signal predictions into the Sparse Bayesian Learning framework," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Toulouse, France, July 2019.
- G. H. Canal, A. K. Massimino, M. A. Davenport, and C. J. Rozell, "Active embedding search via noisy paired comparisons," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Toulouse, France, July 2019.
- S. Karnik, J. Romberg, and M. A. Davenport, "Bandlimited signal reconstruction from nonuniform samples," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Toulouse, France, July 2019.
- A. J. Little, N. Ahad, M. A. Davenport, and S. Sonenblum, "Towards a real-time in-seat activity tracker," *Black in AI Workshop (co-located with NeurIPS)*, Long Beach, California, December 2017.
- A. Rashidi, M. A. Davenport, D. V. Anderson, C. F. Cheng, and C. A. Sabillon, "Achievements and challenges in audio-based modeling of construction operations," *173rd Meet. of the Acoustical Society of America*, Boston, Massachusetts, June 2017.
- M. G. Moore and M. A. Davenport, "Sparse parametric estimation of Poisson processes," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Lisbon, Portugal, June 2017.

- L. Xu and M. A. Davenport, "Dynamic one-bit matrix completion," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Lisbon, Portugal, June 2017.
- R. S. Srinivasa, M. A. Davenport, and J. Romberg, "Sketching with structured matrices for array imaging," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Lisbon, Portugal, June 2017.
- M. A. Davenport, A. K. Massimino, D. Needell, and T. Woolf, "Constrained adaptive sensing," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Cambridge, United Kingdom, July 2015.
- M. G. Moore and M. A. Davenport, "Learning network structure via Hawkes processes," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Cambridge, United Kingdom, July 2015.
- A. K. Massimino and M. A. Davenport, "One-bit matrix completion for pairwise comparison matrices," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Lausanne, Switzerland, July 2013.
- M. G. Moore and M. A. Davenport, "Orthogonal matching pursuit with dictionary refinement for multitone signal recovery," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Lausanne, Switzerland, July 2013.
- M. A. Davenport, Y. Plan, E. van den Berg, M. Wootters, "1-bit matrix completion," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Lausanne, Switzerland, July 2013.
- M. A. Davenport and M. B. Wakin, "Reconstruction and cancellation of sampled multiband signals using discrete prolate spheroidal sequences," *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Edinburgh, Scotland, June 2011.
- M. A. Davenport, C. Hegde, M. B. Wakin, and R. G. Baraniuk, "Manifold-based approaches for improved classification," *NeurIPS Work. on Topology Learning*, Whistler, Canada, December 2007.
- C. Hegde, M. A. Davenport, M. B. Wakin, and R. G. Baraniuk, "Efficient machine learning using random projections," *NeurIPS Work. on Efficient Machine Learning*, Whistler, Canada, December 2007.
- M. A. Davenport, R. G. Baraniuk, and M. B. Wakin, "Scalable inference and recovery from compressive measurements," *NeurIPS Workshop on Novel Applications of Dimensionality Reduction*, Whistler, Canada, December 2006.

SELECTED REPORTS

- T. J. LaGrow, M. G. Moore, J. A. Prasad, A. Webber, M. A. Davenport, and E. L. Dyer, "Sparse recovery methods for cell detection and layer estimation," Technical Report, bioRxiv 445742, December 2018.
- M. A. Davenport, J. N. Laska, P. T. Boufounos, and R. G. Baraniuk, "A simple proof that random matrices are democratic," Rice University ECE Technical Report TREE 0906, November 2009.
- M. A. Davenport, C. Hegde, M. F. Duarte, and R. G. Baraniuk, "A theoretical analysis of joint manifolds," Rice University ECE Technical Report TREE 0901, January 2009.
- M. A. Davenport, M. B. Wakin, and R. G. Baraniuk, "Detection and estimation with compressive measurements," Rice University ECE Technical Report TREE 0610, November 2006.
- M. A. Davenport, "The 2nu-SVM: A cost-sensitive extension of the nu-SVM," Rice University ECE Technical Report TREE 0504, October 2005.

PATENTS

- C. DeLude, J. Romberg, M. A. Davenport, S. Karnik, and R. S. Srinivasa, “Low dimensional encoding broadband beamformer with reduced hardware arrays.” International Patent Application No. PCT/US22/11063. Filed January 2022.
- M. O’Shaughnessy, G. Canal, M. Connor, M. A. Davenport, and C. J. Rozell, “Generative Causal Explanations of Black-Box Classifiers.” International Patent Application No. PCT/US2021/03884. Filed June 2021.
- G. Canal, C. J. Rozell, S. Fenu, M. A. Davenport, and A. Massimino “Systems and methods for preference and similarity learning.” International Patent Application No. PCT/US2020/016379. Filed March, 2020.
- R. G. Baraniuk, P. T. Boufounos, and M. A. Davenport, “Method and Apparatus for Compressive Domain Filtering and Interference Cancellation.” US Patent No. 8,725,784. Issued May 13, 2014.
- R. G. Baraniuk, D. Z. Baron, M. F. Duarte, M. Elnozahi, M. B. Wakin, M. A. Davenport, J. N. Laska, J. A. Tropp, Y. Massoud, S. Kirolos, T. Ragheb, “Method and Apparatus for On-Line Compressed Sensing.” US Patent No. 8,687,689. Issued April 1, 2014
- R. G. Baraniuk, P. T. Boufounos, S. R. Schnelle, M. A. Davenport, and J. N. Laska, “Method and Apparatus for Compressive Parameter Estimation and Tracking.” US Patent No. 8,566,053. Issued October 22, 2013.
- R. G. Baraniuk, J. N. Laska, P. T. Boufounos, and M. A. Davenport, “A Method and Apparatus for Automatic Gain Control for Nonzero Saturation Rates.” US Patent No. 8,487,796. Issued July 16, 2013.
- R. G. Baraniuk, M. F. Duarte, M. A. Davenport, and M. B. Wakin, “Method and Apparatus for Signal Detection, Classification and Estimation from Compressive Measurements.” US Patent No. 8,483,492. Issued July 9, 2013.
- R. G. Baraniuk, J. N. Laska, P. T. Boufounos, and M. A. Davenport, “A Method and Apparatus for Signal Reconstruction from Saturated Measurements.” US Patent No. 8,456,345. Issued June 4, 2013.
- R. G. Baraniuk, D. Z. Baron, M. F. Duarte, S. Sarvotham, M. B. Wakin, and M. A. Davenport, “Method and Apparatus for Distributed Compressed Sensing.” US Patent No. 7,511,643. Issued March 31, 2009.
- R. G. Baraniuk, D. Z. Baron, M. F. Duarte, S. Sarvotham, M. B. Wakin, and M. A. Davenport, “Method and Apparatus for Distributed Compressed Sensing.” US Patent No. 7,271,747. Issued September 18, 2007.

OPINION PIECES

- M. A. Davenport, J. N. Laska, C. J. Rozell, and M. B. Wakin, “The Way I See It: The Lessons of Rejection Shouldn’t be Overlooked.” Rice University News, July 15, 2009.

INVITED PRESENTATIONS

- “Low-rank matrix recovery from quantized or count observations,” *Virtual Workshop on Missing Data Challenges in Computation, Statistics, and Applications*, Institute for Advanced Studies, Online, September 2020.
- “Learning from paired comparisons: Geometry, adaptivity, and dynamics,” *Department of Electrical and Computer Engineering, Rice University*, Houston, Texas, February 2020.

“Subspaces and sparsity on the continuum,” *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Toulouse, France, July 2019.

“Learning from noisy paired comparisons,” *Work. On Machine Learning for Science and Engineering (MLSE)*, Atlanta, Georgia, June 2019.

“Learning from paired comparisons,” *Spring Central and Western Joint Sectional Meeting of the American Mathematical Society*, Honolulu, Hawaii, March 2019.

“Sparse approximation for continuous-time signals,” *Cirrus Logic*, Austin, Texas, July 2018.

“Estimation of inhomogeneous point processes: Theory and applications,” *Institute for Mathematics and its Applications (IMA) Workshop on Forecasting from Complexity*, Minneapolis, Minnesota, April 2018.

“The Fast Slepian Transform,” *Mathematical Institute*, Oxford, United Kingdom, June 2017.

“Low-rank matrix recovery from incomplete observations: An overview and some recent advances,” *Alan Turing Institute*, London, United Kingdom, June 2017.

“The Fast Slepian Transform,” *ITG Workshop on Smart Antennas*, Berlin, Germany, March 2017.

“Localization via paired comparisons and nonmetric multidimensional scaling,” *Department of Electrical and Computer Engineering, University of Washington*, Seattle, Washington, August 2016.

“Localization and nonmetric multidimensional scaling via paired comparisons,” *Simons Institute Workshop on Real-Time Decision Making*, Berkeley, California, June 2016.

“Localization from paired comparisons,” *Conference on Information Sciences and Systems (CISS)*, Princeton, New Jersey, March 2016.

“1-bit matrix completion,” *Information and Inference Best Paper Prize Meeting*, Oxford, United Kingdom, August 2015.

“Constrained adaptive sensing,” *ISI World Statistics Congress*, Rio de Janeiro, Brazil, July 2015.

“Localization via paired comparisons,” *ShanghaiTech Symposium on Data Science*, Shanghai, China, June 2015.

“Adaptive sensing for sparse images,” *Lorentz Center Workshop on Transformations in Optics*, Leiden, The Netherlands, May 2015.

“Compressive sensing,” *Lorentz Center Workshop on Transformations in Optics*, Leiden, The Netherlands, May 2015.

“Localization via paired comparisons,” *Department of Mathematics, University of Georgia*, Athens, Georgia, March 2015.

“Localization via paired comparisons,” *Department of Statistics, University of Wisconsin*, Madison, Wisconsin, February 2015.

“Recovery of low-rank matrices from incomplete observations,” *Qualcomm Advanced Modem Technology Forum*, San Diego, California, October 2014.

“Tracking a low-dimensional vector via quantized measurements or pairwise comparisons,” *International Conference on Signal Processing and Communications (SPCOM)*, Bangalore, India, July 2014.

“Tracking a low-dimensional vector via quantized measurements or pairwise comparisons,” *Society for Industrial and Applied Mathematics Annual Meeting*, Chicago, Illinois, July 2014.

“Adaptive sensing of sparse signals in noise,” *Bertinoro Workshop on Sublinear Algorithms*, Bertinoro, Italy, May 2014.

“Adaptive sensing for compressive imaging,” *Imaging and Modeling in Electron Microscopy – Recent Advances*, Banff International Research Station, Canada, May 2014.

“1-bit matrix completion,” *SINE Lab, Colorado School of Mines*, Golden, Colorado, October 2013.

“Sparsity and structure in imaging,” *Chester F. Carlson Center for Imaging Science, Rochester Institute of Technology*, Rochester, New York, October 2013.

- “1-bit matrix completion,” *Rice University Departments of Computational and Applied Mathematics / Electrical and Computer Engineering*, Houston, Texas, October 2013.
- “1-bit matrix completion,” *Center for Control Science and Technology, University of Texas at Dallas*, Dallas, Texas, September 2013.
- “1-bit matrix completion,” *European Conference on Numerical Mathematics and Advanced Applications (ENUMATH)*, Lausanne, Switzerland, August 2013.
- “1-bit matrix completion,” *Claremont McKenna College Department of Mathematical Sciences*, Claremont, California, May 2013.
- “Adaptive envelope estimation of sparse signals,” *Qualcomm Advanced Modem Technology Forum*, San Diego, California, May 2013.
- “A compressive introduction to compressive sensing,” *2013 Annual Meeting of the AAAS*, Boston, Massachusetts, February 2013.
- “To adapt or not to adapt: The power and limits of adaptive sensing,” *Colorado School of Mines Department of Electrical Engineering and Computer Science*, Golden, Colorado, May 2012.
- “To adapt or not to adapt: The power and limits of adaptive sensing,” *Carnegie Mellon University Department of Electrical and Computer Engineering*, Pittsburg, Pennsylvania, February 2012.
- “To adapt or not to adapt: The power and limits of adaptivity for sparse estimation,” *Carnegie Mellon University Department of Statistics*, Pittsburg, Pennsylvania, February 2012.
- “To adapt or not to adapt: The power and limits of adaptive sensing,” *Johns Hopkins University Department of Electrical and Computer Engineering*, Baltimore, Maryland, February 2012.
- “To adapt or not to adapt: The power and limits of adaptive sensing,” *Georgia Institute of Technology School of Electrical and Computer Engineering*, Atlanta, Georgia, February 2012.
- “To adapt or not to adapt: The power and limits of adaptive sensing,” *Arizona State University School of Electrical, Computer, and Energy Engineering*, Tempe, Arizona, January 2012.
- “To adapt or not to adapt: The power and limits of adaptivity for sparse estimation,” *University of North Carolina Department of Statistics and Operations Research*, Chapel Hill, North Carolina, January 2012.
- “How well can we estimate a sparse vector?” *Georgia Institute of Technology School of Electrical and Computer Engineering*, Atlanta, Georgia, November 2011.
- “How well can we estimate a sparse vector?” *University of Michigan Department of Mathematics*, Ann Arbor, Michigan, October 2011.
- “The pros and cons of compressive sensing,” *University of Wisconsin-Madison Department of Electrical and Computer Engineering*, Madison, Wisconsin, October 2011.
- “The pros and cons of compressive sensing,” *University of Minnesota Department of Electrical and Computer Engineering*, Minneapolis, Minnesota, October 2011.
- “Compressive sensing in practice: Noise, quantization, and real-world signals,” *Foundations of Computational Mathematics (FoCM): Workshop on Computational Harmonic Analysis, Image, and Signal Processing*, Budapest, Hungary, July 2011.
- “Compressive sensing: Theory and practice,” *IBM Watson Workshop: Emerging Leaders in Multimedia and Signal Processing*, Hawthorne, New York, October 2010.
- “Compressive measurements for signal acquisition and processing,” *University of Texas at Austin Department of Electrical and Computer Engineering*, Austin, Texas, June 2010.
- “Compressive measurements for signal acquisition and processing,” *Princeton University Department of Electrical Engineering*, Princeton, New Jersey, May 2010.
- “Corruption, justice, and democracy in compressive sensing,” *University of Michigan Department of Electrical Engineering and Computer Science*, Ann Arbor, Michigan, March 2010.

- “Corruption, justice, and democracy in compressive sensing,” *Colorado School of Mines Department of Electrical and Computer Engineering*, Golden, Colorado, March 2010.
- “Compressive imaging: Theory and practice,” *Workshop on Imaging in Electron Microscopy II*, Columbia, South Carolina, February 2010.
- “Starting and running an open access journal,” *Scholarly Communications Workshop, Rice University*, Houston, Texas, October 2009.

SHORT COURSES AND TUTORIALS

- “Sparse recovery and compressive sensing,” *Foundations of Data Science Summer School*, Atlanta, Georgia, August 2019. (Part of a series of lectures co-organized with Arkadi Nemirovski, Vladimir Koltchinskii, Polo Chau, Yao Xie, and Xiaoming Huo)
- “Low-rank matrix completion: An overview and some recent advances,” *Minitutorial on Compressed Sensing/Dimensionality Reduction, SIAM Annual Meeting*, Pittsburgh, Pennsylvania, July 2017. (Part of a series of lectures co-organized with Deanna Needell and Jeff Blanchard)
- “The fundamentals of compressive sensing,” *Department of Electronics and Communication Engineering, National Institute of Technology Karnataka*, Mangalore, India, July 2014.
- “The fundamentals of compressive sensing.” Three part tutorial on compressive sensing produced for IEEE Signal Processing Society Online Video Library, 2013. [<http://bit.ly/1XkIRjD>]
- “The fundamentals of compressive sensing,” *IEEE Signal Processing Society Summer School on Compressive Sensing and MIMO Signal Processing Systems*, National Tsing-Hua University, Hsinchu, Taiwan, July 2012.
- “Compressive sensing in noise and the role of adaptivity,” *JASON Compressed Sensing Study*, La Jolla, California, June 2012.
- “The fundamentals of compressive sensing,” *JASON Compressed Sensing Study*, La Jolla, California, June 2012.
- “Compressive sensing,” *Course on Sparse Representations, Compressed Sensing, and Machine Learning at US Naval Research Laboratory*, Washington, DC, September 2011. (Part of a 4 day course co-taught with Michael Elad and Yann LeCun)

OTHER PRESENTATIONS

- “A historical tour of your (and almost everyone else’s) academic genealogy,” *Department of Electrical and Computer Engineering, Rice University*, Houston, Texas, February 2020.
- “Learning from adaptive paired comparisons,” *Georgia Institute of Technology Quantitative Psychology Brown Bag Series*, Atlanta, Georgia, January 2019.
- “The Fast Slepian Transform,” *Information Theory and Applications Workshop (ITA)*, San Diego, California, February 2017.
- “Learning from pairwise comparisons,” *Information Theory and Applications Workshop (ITA)*, San Diego, California, February 2015.
- “Matrix recovery from coarse observations,” *Foundations of Computational Mathematics (FoCM): Workshop on Computational Harmonic Analysis, Image, and Signal Processing*, Montevideo, Uruguay, December 2014.
- “On the power and limits of adaptivity for sparse signal acquisition,” *Georgia Institute of Technology School of Industrial and Systems Engineering Statistics Seminar*, Atlanta, Georgia, October 2014.
- “Matrix completion: How to deal with massively undersampled datasets,” *Georgia Institute of Technology Quantitative Psychology Brown Bag Series*, Atlanta, Georgia, September 2013.

- “1-bit matrix completion,” *Georgia Institute of Technology School of Industrial and Systems Engineering Statistics Seminar*, Atlanta, Georgia, April 2013.
- “1-bit matrix completion,” *Information Theory and Applications Workshop (ITA)*, San Diego, California, February 2013.
- “1-bit matrix completion,” *Georgia Institute of Technology School of Mathematics Stochastics Seminar*, Atlanta, Georgia, February 2013.
- “Compressive sensing and signal processing,” *Georgia Institute of Technology, ECE 8010*, Atlanta, Georgia, September 2012.
- “A simple framework for analog compressive sensing,” *International Symposium on Mathematical Programming (ISMP)*, Berlin, Germany, August 2012.
- “On the fundamental limits of adaptive sensing,” *Information Theory and Applications Workshop (ITA)*, San Diego, California, February 2012.
- “The limits of adaptive sensing,” *University of California, Berkeley Networking, Communications, and DSP Seminar*, Berkeley, California, December 2011.
- “Corruption, justice, and democracy in compressive sensing,” *Information Theory and Applications Workshop (ITA)*, San Diego, California, January 2010.
- “Sparse geodesic paths,” *NeurIPS Workshop on Manifolds, Sparsity, and Structured Models: When Can Low-Dimensional Geometry Really Help?* Whistler, Canada, December 2009.
- “Compressive radio receivers,” *Communication Theory Workshop (CTW)*, Napa, California, May 2009.
- “Joint manifold models for collaborative inference,” *Institute for Mathematics and Its Applications Hot Topics Workshop: Multi-Manifold Data Modeling and Applications*, Minneapolis, Minnesota, October 2008.
- “Sparse spectral unmixing,” *Computational Imaging VI at SPIE Electronic Imaging*, San Jose, California, January 2008.
- “Compressive signal processing,” *MADALGO Summer School on Data Stream Algorithms*, Aarhus, Denmark, August 2007.
- “Compressive sensing: A new approach to data acquisition,” *Mitsubishi Electronic Research Labs (MERL)*, Boston, Massachusetts, July 2007.
- “The Johnson-Lindenstrauss lemma meets compressed sensing,” *Sparse Approximation Workshop*, Princeton, New Jersey, November 2006.

PROFESSIONAL ACTIVITIES

Editorial Activity

Senior Associate Editor for *IEEE Transactions on Signal Processing* (2020–present)

Associate Editor for *IEEE Transactions on Information Theory* (2019–2023)

Associate Editor for *IEEE Transactions on Signal Processing* (2016–2020)

Meetings Organized

Symposium on “Principles of dynamics and control in machine learning,” at *IEEE Int. Work. On Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, 2019

Symposium on “Low-dimensional dynamical systems in signal processing and data analysis,” at *IEEE Int. Work. on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, 2017

Special session on “Signal processing and adaptive systems,” at *Asilomar Conf. on Signals, Systems, and Computers*, 2017

Symposium on “Randomness and efficient computation in signal processing,” at *IEEE Int. Work. on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, 2015
Mini-symposium on “Finding and exploiting structure in data,” at *SIAM Conf. on Applied Linear Algebra*, 2015
Symposium on “Low-dimensional models and optimization in signal processing,” at *IEEE Global Conf. on Signal and Information Processing (GlobalSIP)*, 2013
Symposium on “Compressive sensing: Sensing sparse phenomena in theory and practice,” at *Annual Meeting of the AAAS*, 2013
Workshop on “Manifolds, Sparsity, and Structured Models: When Can Low-Dimensional Geometry Really Help?” at *Advances in Neural Information Processing Systems (NeurIPS)*, 2009

Technical Program Committees

IEEE Work. on Statistical Signal Processing (SSP), 2012, 2020
AAAI Conf. on Artificial Intelligence, 2020
European Conf. on Signal Processing (EUSIPCO), 2017
Int. Conf. on Artificial Intelligence and Statistics (AISTATS), 2017
IEEE Int. Work. on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), 2015
IEEE Signal Processing and Signal Processing Education Work. (SPW), 2015
Symposium on “Information Processing for Big Data” at *IEEE Global Conf. on Signal and Information Processing (GlobalSIP)*, 2014

University Service

Associate Director, Center for Machine Learning (ML@GT), 2019–present
ECE Graduate Recruiting Coordinator, 2018–present
Member, Institute Graduate Curriculum Committee, 2017–present
Member, ECE Graduate Student Recruitment Committee, 2013–2017, 2019–present
Member, Center for Signal and Information Processing (CSIP), 2012–present
Faculty Advisor, Opportunity Research Scholars Program, 2015–2021
Member, College of Engineering Diversity & Inclusion Council, 2018–2020 (Co-chair, 2019–2020)
Faculty Associate, Georgia Tech Grand Challenges Program, 2013–2016, 2017–2020
Instructor, ECE HOT Days @ GT Summer Camp, 2019
Member, ECE Faculty Recruitment Committee, 2017–2019
Panelist, Young Investigator Award Proposal Workshop (ECE, ME), 2016
Admissions Panel, Georgia Tech President’s Scholarship Program, 2015
Panelist, NSF CAREER Award Proposal Workshop (GT OSP), 2014 & 2015
Member, ECE Student/Faculty Committee, 2012–2013
Guest Lecturer, ECE 8010 Graduate Research Seminar, 2012
Member, Stating Committee on Student Health Insurance (Rice University), 2006–2010
Graduate Student Mentor (Rice University), 2008–2009
Graduate Student Council (ECE Department, Rice University), 2005–2007

Reviewer for the Following Journals

Annals of Statistics
Applied Computational and Harmonic Analysis
Applied Mathematics and Computation
Biometrika

Electronic Journal of Statistics
Foundations of Computational Mathematics
IEEE Journal of Selected Topics in Signal Processing
IEEE Signal Processing Letters
IEEE Signal Processing Magazine
IEEE Transactions on Aerospace and Electronic Systems
IEEE Transactions on Circuits and Systems I
IEEE Transactions on Communications
IEEE Transactions on Computational Imaging
IEEE Transactions on Image Processing
IEEE Transactions on Instrumentation and Measurement
IEEE Transactions on Information Theory
IEEE Transactions on Knowledge and Data Engineering
IEEE Transactions on Neural Networks
IEEE Transactions on Signal Processing
Information and Inference
Inverse Problems
Journal of Complexity
Journal of the European Mathematical Society
Journal of Machine Learning Research
Journal of the Royal Statistical Society: Series B
Machine Learning
Neurocomputing
Pattern Recognition
Pattern Recognition Letters
Physical Communication
Signal Processing
SIAM Journal on Imaging Sciences
SIAM Journal on Numerical Analysis

Reviewer for the Following Conferences

AAAI Conf. on Artificial Intelligence
Conference on Computational Complexity (CCC)
Conference on Learning Theory (COLT)
European Conference on Signal Processing (EUSIPCO)
IEEE Global Conference on Signal Processing (GlobalSIP)
IEEE Information Theory Workshop (ITW)
IEEE Int. Conference on Communications (ICC)
IEEE Int. Conference on Computer Communications (INFOCOM)
IEEE Int. Symposium on Information Theory (ISIT)
IEEE Int. Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)
IEEE Signal Processing and Signal Processing Education Workshop (SPW)
IEEE Symposium on Foundations of Computer Science (FOCS)
IEEE Workshop on Statistical Signal Processing (SSP)
Int. Conference on Machine Learning (ICML)
Int. Conference on Sampling Theory and Applications (SAMPTA)

Military Communications Conference (MILCOM)

Neural Information Processing Systems (NeurIPS)

Workshop on Signal Processing with Adaptive Sparse Structured Representations (SPARS)

Reviewer for the Following Funding Agencies

Air Force Office of Scientific Research (AFOSR)

National Science Foundation (NSF)

Professional Societies

IEEE (Senior Member), SIAM, Tau Beta Pi, Eta Kappa Nu

P R E S S

***Rejecta Mathematica*, 2009**

Science, The Economist, Nature.com, USA Today, Chronicle of Higher Education, AMS Math in the Media, Ars Technica, MathDL, Rice News, Seed Magazine, Slashdot

***Single-Pixel Camera and Compressive Sensing*, 2006–2008**

Scientific American, SIAM Review, MIT Technology Review, Nature Photonics, New Scientist, The Economist, BBC News, BBC Digital Planet, The Guardian, The Times Online, USA Today, Business Week, Houston Chronicle, NAE Radio Series on Engineering, NPR (KUHF Houston Public Radio), Slashdot Technology Review TR10 Emerging Technologies for 2007