

MARK A. DAVENPORT

Georgia Institute of Technology
School of Electrical and Computer Engineering
777 Atlantic Drive NW, Atlanta, GA 30332

(404) 894-2881
mdav@gatech.edu
mdav.ece.gatech.edu

RESEARCH INTERESTS

Signal processing, statistical inference, and machine learning with high-dimensional data
Low-dimensional models and the use of optimization for exploiting structure in data
Sparse approximation; low-rank matrix recovery; inverse problems

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

Associate Professor of Electrical and Computer Engineering

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

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

SELECTED HONORS AND RESEARCH AWARDS

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
IEEE Signal Processing Society Best Paper Award, 2015
Information and Inference Best Paper Prize Finalist, 2015
AFOSR Young Investigator Award, 2014
NSF CAREER Award, 2014
Ralph Budd Award for Best Thesis in the School of Engineering at Rice University, 2011
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

TEACHING AWARDS

CETL “Thank a Teacher” Certificate, 2019
Class of 1940 W. Roane Beard Outstanding Teacher Award, 2017
CETL/BP Junior Faculty Teaching Excellence Award, 2016
Richard M. Bass Outstanding Teacher Award, 2015
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

PROFESSIONAL ACTIVITIES

Editorial Activity

Associate Editor for *IEEE Transactions on Information Theory* (2019–present)
Associate Editor for *IEEE Transactions on Signal Processing* (2016–present)

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, College of Engineering Diversity & Inclusion Council, 2018–present (Co-chair, 2019–present)
Member, Institute Graduate Curriculum Committee, 2017–present
Faculty Advisor, Opportunity Research Scholars Program, 2015–present
Member, ECE Graduate Student Recruitment Committee, 2013–2017, 2019–present
Faculty Associate, Georgia Tech Grand Challenges Program, 2013–2016, 2017–present
Member, Center for Signal and Information Processing (CSIP), 2012–present
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), Tau Beta Pi, Eta Kappa Nu

RESEARCH SUPPORT

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 – 2020)

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)

COURSES TAUGHT

Advanced Digital Signal Processing

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

Convex Optimization: Theory, Algorithms, and Applications

ECE 8823c, Georgia Institute of Technology
Spring 2019

Statistical Machine Learning

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

Introduction to Probability and Statistics for ECEs

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

Introduction to Signal Processing

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

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

Yinglun Xu, 2020–present

Topic: Algorithms for adversarial multi-armed bandit problems with strategic arms
Co-advised with Jacob Abernethy

Charles Topliff, 2019–present

Topic: Forecasting and inverse problems in space weather
Co-advised with Morris Cohen

Austin Xu, 2019–present

Topic: Learning metrics and embeddings from paired comparisons

Andrew McRae, 2018–present

Topic: Exploiting low-dimensional structure in learning
ARC-TRIAD Student Fellowship

Namrata Nadagouda, 2018–present

Topic: Active similarity learning

Nauman Ahad, 2017–present
Topic: Robust change point detection

Niranjana Kannabiran, 2016–present
Topic: Mass prediction from observation of object dynamics
Co-advised with Irfan Essa

Matthew R. O’Shaughnessy, 2016–present
Topic: Causal inference using low-dimensional and temporal structure
Co-advised with Christopher Rozell
NDSEG Graduate Fellowship

Santhosh Karnik, 2015–present
Topic: Fast algorithms for sampled multiband signals

Chieh-Feng Cheng, 2015–2019
Thesis: Audio classification and event detection based on small-size weakly labelled data
Co-advised with David Anderson

Liangbei Xu, 2014–2019
Thesis: Dynamic low-rank matrix recovery: Theory and applications
Now at Twitter

Andrew K. Massimino, 2012–2018
Thesis: Learning to adapt under practical sensing constraints
Algorithms and Randomness Center (ARC) Student Fellowship
Now at Goldman Sachs

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 at Infinia ML, Inc (visiting faculty at Duke University)

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)

Doctoral Committees

Shu-Han Hsu, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2020

Advisor: Linda Milor

Thesis: Reliability and data analysis of wearout mechanisms for ring oscillator circuits

Griffin Lee, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2020

Advisor: Nazanin Bassiri-Gharb

Thesis: Physical and chemical insights into complex ferroelectric oxides through machine learning approaches

Jonathan Zia, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2020

Advisor: Omer Inan

Thesis: On the assessment of cardiomechanical function via wearable sensing systems: Harnessing population-level patterns and dynamics for robust physiological monitoring

Charles Hayes, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2020

Advisor: James McClelland and Waymond Scott

Thesis: Low-rank model exploitation of electromagnetic induction sensors

Ali Payani, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2020

Advisor: Faramarz Fekri

Thesis: Differentiable neural logic networks and their application onto induction logic programming

Shaojie Xu, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2020

Advisor: Justin Romberg

Thesis: Machine learning algorithm design for hardware performance optimization

Nicholas Bertrand, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2019

Advisor: Christopher Rozell

Thesis: Exploiting structure in dynamical systems for tracking and dimensionality reduction

John Lee, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2019

Advisor: Christopher Rozell

Thesis: Exploiting low-dimensional structure and optimal transport for tracking and alignment

Yazeed Alaudah, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2019

Advisor: Ghassan AlRegib

Thesis: Weakly supervised semantic labeling of migrated seismic data

Keerthi Arumugam, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2019

Advisor: Matthieu Bloch

Thesis: Covert communication over multi-user channels

Seyyed Hamed Fouladi, PhD, Norwegian University of Science and Technology, 2018

Advisors: Ilangko Balasingham and Kimmo Kansanen

Thesis: On signal recovery: Independent component analysis for multiple measurement vectors and source separation

Nathan Parrish, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2018

Advisor: David Anderson

Thesis: System configuration for proportional control of an assistive technology for patients with cervical spinal-cord injuries

Jason Zutty, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2018

Advisor: Aaron Lanterman

Thesis: Automated machine learning: A biologically inspired approach

Nicholas Gross, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2018

Advisor: Morris Cohen

Thesis: An ionospheric remote sensing method using an array of narrowband VLF transmitters and receivers

Brandon Carroll, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2018

Advisor: David Anderson

Thesis: Characterizing acoustic environments with OLAF and ELSA

Fan Zhou, PhD, Mathematics, Georgia Institute of Technology, 2018

Advisor: Vladimir Koltchinskii

Thesis: Statistical inference of high dimensional data with low rank structure

Yichen Wang, PhD, Computational Science and Engineering, Georgia Institute of Technology, 2018

Advisor: Le Song

Thesis: Modeling, learning, predicting, and guiding dynamics processes over networks

Yang Cao, PhD, Industrial and Systems Engineering, Georgia Institute of Technology, 2018

Advisor: Yao Xie

Thesis: Poisson matrix completion and sequential change-point detection

Mehrdad Farajtabar, PhD, Computational Science and Engineering, Georgia Institute of Technology, 2018

Advisors: Hongyuan Zha and Le Song

Thesis: Point process modeling and optimization of social networks

Ning Tian, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2018

Advisor: Justin Romberg

Thesis: Multichannel blind deconvolution in underwater acoustic channels

Zhihui Zhu, PhD, Colorado School of Mines, 2017

Advisor: Michael Wakin

Thesis: Subspace approximation on the continuum

Muhammad Rizwan, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2017

Advisor: David Anderson

Thesis: Adaptation of hybrid deep neural network-hidden Markov model speech recognition system using a sub-space approach

Peter Tuuk, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2017

Advisor: James McClellan

Thesis: Compressed sensing in radar with structured interference

Stephanie Gillespie, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2017

Advisor: Elliot Moore

Thesis: Analysis of affective states from vocal acoustics in adults with aphasia

Scott Spencer, PhD, Mathematics, Georgia Institute of Technology, 2017

Advisor: Michael Lacey

Thesis: Weighted inequalities via dyadic operators and a learning theory approach to compressed sensing

Matthew Hale, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2017

Advisors: Magnus Egerstedt and Yorai Wardi

Thesis: Mixed centralized/decentralized coordination protocols for multi-agent systems

Kaitlin Fair, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2017

Advisor: David Anderson

Thesis: A biologically plausible sparse approximation solver on neuromorphic hardware

Jun Zou, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2016

Advisor: Faramarz Fekri

Thesis: Social computing for personalization and credible information mining using probabilistic graphical models

Adam Charles, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2015

Advisor: Christopher Rozell

Thesis: Dynamics and correlations in sparse signal acquisition

Sigma Xi Best Dissertation Award

Aurèle Balavoine, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2014

Advisors: Justin Romberg and Christopher Rozell

Thesis: Mathematical analysis of a dynamical system for sparse recovery

Nicholas Tzou, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2014

Advisor: Abhijit Chatterjee

Thesis: Low-cost sub-Nyquist sampling hardware and algorithm codesign for wideband and high-speed signal characterization and measurement

Hassan Kingravi, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2014

Advisor: Patricio Vela

Thesis: Reduced-set methods for improving the training and execution speed of kernel methods

Ali Ahmed, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2013

Advisor: Justin Romberg

Thesis: Low-rank matrix recovery: Blind deconvolution and efficient sampling of correlated signals

Salman Asif, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2013

Advisor: Justin Romberg

Thesis: Dynamic compressive sensing: Sparse recovery algorithms for streaming signals and video

William Mantzel, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2013

Advisor: Justin Romberg

Thesis: Parametric estimation of randomly compressed functions

Han Lun Yap, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2012

Advisor: Christopher Rozell

Thesis: Constrained measurement systems of low-dimensional signals

Chenchi Luo, PhD, Electrical and Computer Engineering, Georgia Institute of Technology, 2012
Advisor: James McClellan
Thesis: Non-uniform sampling: Algorithms and architectures

PRESS

***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

CONSULTING AND INDUSTRIAL EXPERIENCE

Data Science and Machine Learning Advisor, Mogeon, 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

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, “Sample complexity and effective dimension for regression on manifolds,” *Preprint*, 2020.
- M. O’Shaughnessy, G. Canal, M. Connor, M. A. Davenport, and C. J. Rozell, “Generative casual explanations of black-box classifiers.” *Preprint*, 2020.
- S. Karnik, J. Romberg, and M. A. Davenport, “Improved characterization of the eigenvalue behavior of discrete prolate spheroidal sequences,” *Preprint*, 2020.
- N. Ahad, S. E. Sonenblum, M. A. Davenport, and S. Sprigle, “Validating a wheelchair in-seat activity tracker,” *Preprint*, 2020.
- A. K. Massimino and M. A. Davenport, “As you like it: Localization via paired comparisons,” *Preprint*, 2018.
- T. J. LaGrow, M. G. Moore, J. A. Prasad, A. Weber, M. A. Davenport, and E. L. Dyer, “Sparse recovery methods for cell detection and layer estimation,” *Preprint*, 2018.

- A. D. McRae and M. A. Davenport, “Low-rank matrix completion and denoising under Poisson noise,” to appear in *Information and Inference*, 2020.
- 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.
- 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

- R. S. Srinivasa, M. A. Davenport, and J. Romberg, "Sample complexity bounds for localized sketching," to appear 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

- 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. Wooters, "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

- 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 2 ν -SVM: A cost-sensitive extension of the ν -SVM," Rice University ECE Technical Report TREE 0504, October 2005.

PATENTS

- M. O’Shaughnessy, G. Canal, M. Connor, M. A. Davenport, and C. J. Rozell, “Generative Causal Explanations of Black-Box Classifiers.” US Provisional Patent Application No. 63/043,331. Filed June 2020.
- 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 February 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

- “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*, Pittsburgh, Pennsylvania, February 2012.
- “To adapt or not to adapt: The power and limits of adaptivity for sparse estimation,” *Carnegie Mellon University Department of Statistics*, Pittsburgh, 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.