

RICHARD G. BARANIUK

Rice University
Department of Electrical and Computer Engineering
Houston, TX 77005, USA
Email: richb@rice.edu, Web: richb.rice.edu, Tel: 713-348-5132
August 22, 2019

RESEARCH INTERESTS

Machine learning; signal and image processing theory and applications, sparsity and compressive sensing; open-source learning; learning analytics, personalized learning

EDUCATION

1993	Ecole Normale Supérieure de Lyon	Postdoctoral Fellow in Signal Processing
1992	University of Illinois–Urbana	Ph.D. in Electrical and Computer Engineering
1988	University of Wisconsin–Madison	M.Sc. in Electrical and Computer Engineering
1987	University of Manitoba	B.Sc. in Electrical Engineering (with distinction)

POSITIONS

2012–present	OpenStax	Director/Founder
2004–present	Rice University	Victor E. Cameron Professor
2000–2004	Rice University	Professor
1999–2012	Connexions	Director/Founder
1998	Isaac Newton Institute, Cambridge University	Rosenbaum Fellow
1996–2000	Rice University	Associate Professor
1993–1996	Rice University	Assistant Professor
1992–1993	Ecole Normale Supérieure de Lyon (France)	Postdoctoral Fellow
1988–1992	University of Illinois–Urbana	Research Assistant
1987–1988	University of Wisconsin–Madison	Graduate Fellow
1987	National Research Council of Canada	Research Assistant
1986	Omron Tateishi Electronics (Kyoto, Japan)	R&D Engineer

Sabbatical 2001–2002 Ecole Nationale Supérieure de Télécommunications (Paris, France)
Ecole Polytechnique Fédérale de Lausanne (Switzerland)

AWARDS and HONORS

2018 Faculty Award for Excellence in Research, Teaching, and Service (Rice)
2018 Clarivate Analytics Highly Cited Researcher (previously Thomson Reuters)
2017 Vannevar Bush Faculty Fellow (National Security Science and Engineering Faculty Fellow)
2017 Fellow of the American Academy of Arts and Sciences
2017 Hershel M. Rich Invention Award (Rice)
2016 Fellow of the National Academy of Inventors
2016 Thomson Reuters’ Highly Cited Researcher
2016 Person of Impact, University of Wisconsin-Madison

- 2016 Hershel M. Rich Invention Award (Rice)
- 2015 IEEE James H. Mulligan, Jr. Education Medal
- 2015 IEEE Signal Processing Society Best Paper Award
- 2015 Thomson Reuters' Highly Cited Researcher
- 2015 $(T + R)^2$: Excellence in Teaching and Research Award (Rice)
- 2014 IEEE Signal Processing Society Technical Achievement Award
- 2014 Thomson Reuters' Highly Cited Researcher
- 2014 Presidential Mentoring Award (Rice)
- 2012 SPIE Compressive Sampling Pioneer Award
- 2011 WISE Education Award for Connexions (Qatar Foundation)
- 2011 Padovani Lecture, IEEE Information Theory Society
- 2010 IEEE Signal Processing Society Education Award
- 2009 Fellow of the American Association for the Advancement of Science (AAAS)
- 2009 IEEE Signal Processing Society Magazine Column Award
- 2009 World Technology Award for Education
- 2008 Internet Pioneer Award, Berkman Center for Internet and Society at Harvard Law School
- 2008 SPIE Wavelet Pioneer Award
- 2007 Edutopia Magazine's "Daring Dozen" Education Innovators
- 2007 MIT Technology Review TR10 Top 10 Emerging Technology for the Rice Single-Pixel Camera
- 2007 Hershel M. Rich Invention Award (Rice)
- 2006 Tech Museum of Innovation Laureate for Connexions
- 2006 George R. Brown Award for Superior Teaching (Rice)
- 2003 Co-Author on Passive and Active Measurement Workshop Student Paper Award
(with V. Ribeiro, R. Riedi, J. Navratil, and L. Cottrell)
- 2003 George R. Brown Award for Superior Teaching (Rice)
- 2002 Fellow of the Institute of Electrical and Electronic Engineers (IEEE)
- 2001 Co-Author on IEEE Signal Processing Society Junior Paper Award (with M. Crouse and R. Nowak)
- 2001 IEEE NORSIG Best Paper Award (with E. Monsen, J. Odegard, H. Choi, J. Romberg)
- 2001 George R. Brown Award for Superior Teaching (Rice)
- 2000 University of Illinois ECE Young Alumni Achievement Award
- 2000 Charles Duncan Junior Faculty Achievement Award (Rice)
- 1999 C. Holmes MacDonald National Outstanding Teaching Award (Eta Kappa Nu)
- 1998 Rosenbaum Fellowship, Isaac Newton Institute, Cambridge University
- 1995 ONR Young Investigator Award
- 1994 NSF National Young Investigator Award
- 1992 National Sciences and Engineering Research Council of Canada NATO Postdoctoral
Fellowship
- 1987 Wisconsin Alumni Research Foundation Fellowship
Bacon Scholarship (U. Wisconsin)
Eta Kappa Nu Award for Second-Ranked Graduating Electrical Engineer (U. Manitoba)
IEEE Award for Best Undergraduate Thesis Defense (U. Manitoba)
- 1986 E. P. Fetherstonhaugh Scholarship (U. Manitoba)
- 1977 Top Project at the University of Winnipeg Science Symposium (Provincial Science Fair)

RESEARCH SUPPORT

2019–2022 NSF *Accelerating STEM Learning Through Large-Scale Data Science*

2019–2020	NSF	<i>A Scalable Knowledge Network to Enable Intelligent Textbooks</i>	
2019–2022	NSF	<i>A Probabilistic Theory of Deep Learning via Spline Operators</i>	
2019–2022	DOE	<i>Deep Learning for Forecasting Fracture and Fault Evolution</i>	(co-PI)
2019	ONR	<i>C3 Lensless: Computation and Communication Enabled on-Chip Lensless Imager</i>	(co-PI)
2019	DARPA	<i>ENIGMA: A Visual Sensor for Privacy Preserving Machine Learning</i>	(co-PI)
2018–2022	ONR	<i>Randomized Numerical Linear Algebra for Large-Scale Learning and Inference (Basic Research Challenge)</i>	
2018–2022	NSF	<i>Theory and Practice of Randomized Algorithms for Ultra-Large-Scale Signal Processing (BIGDATA)</i>	(co-PI)
2018–2021	AFOSR	<i>A Spline Theory of Deep Learning</i>	
2018	Amazon	<i>Scaling-up Machine Learning via Probabilistic Hashing</i>	(co-PI)
2017–2022	DOD	<i>Vannevar Bush Faculty Fellow (National Security Science and Engineering Faculty Fellow)</i>	
2017–2020	DARPA	<i>IBIS: Implantable Bioluminescence Imaging System</i>	(co-PI)
2017–2020	ONR	<i>Human-In-The-Loop Machine Learning</i>	
2017–2018	Bill and Melinda Gates Foundation	<i>An Open Assessment Network (AN) to Catalyze Improvement of Digital Courseware</i>	
2017–2018	Open Society Foundations	<i>AP US History Courseware</i>	
2016–2019	NSF	<i>Operationalizing Students’ Textbook Annotations to Improve Comprehension and Long-Term Retention</i>	(co-PI)
2016–2020	DARPA	<i>OMNISCIENT (REVEAL Program)</i>	(co-PI)
2016–2017	IBM	<i>Open Collaborative Research Award</i>	
2016–2017	IARPA	<i>MICrONS: Reverse Engineering Neocortical Intelligence</i>	(co-PI)
2016–2017	Texas Education Agency	<i>Advanced Placement OpenStax Textbook Development</i>	
2016–2017	Beneficus Foundation	<i>OpenStax Tutor V2</i>	
2016–2017	Maxfield Foundation	<i>OpenStax Tutor V2</i>	
2016–2017	Sick Foundation	<i>OpenStax Tutor V2</i>	
2016–2017	Katalyst Foundation	<i>OpenStax Internationalization</i>	
2016	Hewlett Foundation	<i>OpenStax Community Outreach</i>	
2015–2018	ARO	<i>Information Processing and Fusion via Sparse Factorization</i>	
2015–2018	NSF	<i>Lens-Free Imaging: Can Signal Processing Replace Lenses?</i>	
2015–2018	AFOSR	<i>Sparse Factor Analysis for Information Extraction and Fusion</i>	
2015–2017	ONR	<i>(NCoM) Nanophotonic Compressive iMaging: On-chip Compressive Lensless, Light-field and Hyper-spectral Sensors</i>	
2015–2016	NSF	<i>EAGER: Fabrication of Thin, Lens-Free Cameras for Visible and SWIR</i>	

		<i>Imaging</i>	(co-PI)
2015–2016	NGA	<i>Fast Algorithms for Sparsity, Dictionary Learning and Detection from Compressed Data</i>	(co-PI)
2014–2017	Bill and Melinda Gates Foundation	<i>OpenStax Courseware</i>	
2014–2016	Laura and John Arnold Foundation	<i>OpenStax Tutor Prototype</i>	
2014–2016	AFOSR	<i>Millimeter-Wave Hyper-Spectral Three-Dimensional Imaging using Coherent Sub-Picosecond Pulses</i>	(co-PI)
2013–2016	ONR	<i>Image Optimization for Small Focal Plane Arrays</i>	(co-PI)
2013–2015	Beneficus Foundation	<i>OpenStax College Phase 3</i>	
2013–2015	Laura and John Arnold Foundation	<i>OpenStax College Phase 3</i>	
2013–2014	Hewlett Foundation	<i>OpenStax College Phase 3</i>	
2013–2014	Laura and John Arnold Foundation	<i>OpenStax College Phase 2</i>	
2012–2013	Hewlett Foundation	<i>OpenStax College Phase 2</i>	
2012–2013	Hewlett Foundation	<i>Connexions Platform Redesign</i>	
2012–2013	Open Society Foundations	<i>Connexions Platform Redesign</i>	
2012–2013	Google	<i>Connexions Platform Redesign</i>	
2012–2014	ONR	<i>Image Feature Articulation Manifolds for Advanced Situational Awareness</i>	
2012–2013	ONR	<i>DURIP: Semiconductor Implementation of Compressive Data Acquisition Systems</i>	(co-PI)
2011–2015	NSF	<i>A Personalized Cyberlearning System Based on Cognitive Science</i>	
2011–2014	ONR	<i>Compressive Sensing for Image Understanding: Human Activity Analysis</i>	(co-PI)
2011–2014	TI	<i>Texas Instruments Leadership University Program</i>	(co-PI)
2011–2014	ONR	<i>Mathematics of Low-Dimensional Representations for Design (Basic Research Challenge)</i>	(co-PI)
2011–2014	NSF	<i>Computational Tools for Visual Inference of Complex Materials</i>	(co-PI)
2011–2014	ONR	<i>Compressive Sensing for Image Understanding</i>	
2011–2013	Hewlett Foundation	<i>OpenStax College Phase 1</i>	
2011–2013	Gates Foundation	<i>OpenStax College Phase 1</i>	
2011–2013	20MM Foundation	<i>OpenStax College Phase 1</i>	
2011–2012	Google	<i>Personalized Learning via Machine Learning</i>	
2010–2014	ONR	<i>Biologically-Inspired Routes to Sense-and-Response in Adaptive, Intelligent Metamaterials (Basic Research Challenge)</i>	(co-PI)
2010–2014	NSF	<i>CI-TEAM: The Signal Processing Education Network</i>	
2010–2014	DARPA	<i>Knowledge-Enhanced Compressive Active Radar Arrays</i>	(co-PI)
2010–2014	DARPA	<i>Knowledge Enhanced Compressive Measurement</i>	(co-PI)

2010–2011	LLNL	<i>New Compression Techniques for High-Resolution Airborne Sensors</i>	
2010–2011	NGA	<i>Multiscale Compression of Point Cloud Data</i>	
2009–2014	ARO	<i>MURI: Opportunistic Sensing for Object and Activity Recognition from Multi-Modal, Multi-Platform Data (Project Director)</i>	
2009–2014	NSF	<i>Expeditions in Computing: Customizable Domain-Specific Computing</i>	(co-PI)
2009–2012	AFOSR	<i>New Theory and Algorithms for Scalable Data Fusion</i>	
2009–2010	ONR	<i>Compressive Video Acquisition, Fusion, and Processing</i>	
2008–2011	DARPA	<i>Information Scalable Analog-to-Information Receivers</i>	
2008–2010	Hewlett Foundation	<i>Connexions Project Core Support</i>	(co-PI)
2008–2012	ONR	<i>Theory and Methods for Model-Based Compressive Sensing</i>	
2008–2011	TI	<i>Texas Instruments Leadership University Program</i>	(co-PI)
2008–2009	ONR	<i>Efficient Collaborative Inference in Networks of Sensors</i>	
2008–2009	ONR	<i>Compressive Imaging via Randomized Multiplexing</i>	
2008–2009	ONR	<i>DURIP: Multidimensional Compressive Data Acquisition System</i>	
2007–2008	Hewlett Foundation	<i>Connexions Project Bridge Support</i>	
2007–2010	NSF	<i>Collaborative Research: Design and Analysis of Compressed Sensing DNA Microarrays</i>	(co-PI)
2007–2010	ARO	<i>MURI: Model Classes, Approximation, and Metrics for Dynamic Processing of Urban Terrain Data</i>	(co-PI)
2007–2010	ONR	<i>Universal Sensing and Processing using Compressive Sensing</i>	
2007–2010	AFOSR	<i>Compressive Signal Processing</i>	
2006–2007	Hewlett Foundation	<i>Connexions Project Core Support</i>	
2006–2009	NSF	<i>Building Communities and Sharing Knowledge in Engineering Education: A University/Industry Partnership (with National Instruments)</i>	(co-PI)
2006–2007	TI	<i>Compressive Sensing for Vision Applications</i>	
2006–2007	ONR	<i>New Theory and Algorithms for Compressive Sensing</i>	
2006–2007	ONR	<i>Manifold-based Image Understanding</i>	
2006–2007	DARPA	<i>Compressive Optical Imaging Systems — Theory, Devices, and Implementation</i>	
2006–2007	DARPA	<i>Theory and Practice of Analog-to-Information Conversion</i>	
2005–2008	NSF	<i>Adaptivity in Sensor Networks for Optimized Distributed Sensing and Signal Processing</i>	
2005–2008	ONR	<i>Higher-Dimensional Signal Processing via Multiscale Geometric Analysis</i>	
2005–2008	AFRL	<i>Multisensor Registration via Multiscale Geometric Analysis (co-PI)</i>	
2004–2007	NSF	<i>Multiscale Geometric Analysis for Higher-Dimensional Signal Processing</i>	

2004–2007	NSF	<i>Multiscale Sensor Network Architecture for Distributed Data Processing</i>	
2004–2006	Hewlett Foundation	<i>Connexions – Sharing Knowledge and Building Communities</i>	
2004–2007	AFOSR	<i>Multiscale Analysis, Modeling, and Processing of High-Dimensional Geometric Data</i>	
2004	NSF	<i>WAMA 2004: Wavelets And Multifractal Analysis Workshop</i> (workshop support)	
2003–2006	NSF	<i>Safari: A Scalable Architecture for Ad Hoc Networking and Services</i>	(co-PI)
2002–2004	DARPA	<i>Integrated Sensing and Processing in Missile Systems</i> (with Raytheon)	
2002–2004	Hewlett Foundation	<i>Connexions – Education for a Networked World</i>	
1999–2004	TI	<i>Texas Instruments Leadership University Program</i>	(co-PI)
2002–2004	ONR	<i>Coherent Multiscale Statistical Modeling using Complex Wavelets</i>	
2001–2004	DOE	<i>INCITE: Edge-based Traffic Processing and Service Inference for High-Performance Networks</i>	
2001–2004	NSF	<i>Internet Control and Inference from the Edge</i>	(co-PI)
2000–2004	DARPA	<i>Multiscale Traffic Processing Techniques for Network Inference and Control</i>	
2001–2003	AFOSR	<i>Multiscale Statistical Models for Signal and Image Processing</i>	
1999–2001	Nokia	<i>Development of a High-Speed Wireless LAN</i>	(co-PI)
1999–2001	Texas	<i>High-Speed Wireless Local Area Network</i>	(co-PI)
1999–2002	NSF	<i>Wireless Technology: Seamless Multitier Wireless Networks for Multimedia Applications</i>	(co-PI)
1999–2002	NSF	<i>Multiscale Signal and Image Processing using Singularity Grammars</i>	
1999–2001	ONR	<i>Model-based Multiscale Signal and Image Processing</i>	
1999	NSF	<i>Acquisition of a High Performance Computer System for the Center for Computational Geophysics</i>	(co-PI)
1998–2000		<i>Rice Consortium for Computational Seismic Interpretation</i> Sponsors: Amerada-Hess, Arco, Conoco, Elf Aquitaine, Halliburton, Mobil, Schlumberger	
1998–2001	EPA	<i>Development of a New Gas Sensing System based on Terahertz Time-Domain Spectroscopy</i>	(co-PI)
1997–2000	DARPA	<i>Wavelet-based Detection Algorithms for ATD/R</i>	(co-PI)
1996	NSF	<i>CISE Research Instrumentation: A Medium Scale, Tightly Coupled, Shared Memory Multiprocessor</i>	(co-PI)
1995–1998	ONR	<i>Operator-Based Approaches for Matching Signal Processing Tools to Data</i> (Young Investigator Award)	
1994–2000	NSF	<i>Signal Analysis and Processing in Matched Coordinate Systems</i>	

(National Young Investigator Award)

1995–1997 NATO *Information Theoretic Time-Frequency and Time-Scale Signal Analysis*

1994–1996 Texas *New Data Compression Technology based on Time-Varying Wavelets*

Industrial sponsors have included: Texas Instruments, National Instruments, Nokia, Nortel, SBC Raytheon, Northrop-Grumman, Shell Research, Conoco-Phillips Exxon, Mobil, Arco, Elf Aquitaine, Amerada Hess, Schlumberger

STUDENTS

Postdocs: Hamid Javadi (PhD from Stanford University), Yehuda Dar (PhD from the Technion)

PhD students: Randall Balestrieri, CJ Barberan (NDSEG, NSF, GEM, Intel Foundation Fellow), Daniel LeJeune, Pavan Kota (NIH NLM Fellow), Lorenzo Luzi (NSF Fellow), Paul Mayer, Tan Minh Nguyen (NSF IGERT, NSF Fellow), Shashank Sonkar, Jasper Tan, Jack Wang (D2K Fellow)

Postdoc alums: Gautam Dasarathy (Asst. Prof., Arizona State University), 2016–2018
Salman Asif (Asst. Prof., University of California, Riverside) 2014–2016
Ankit Patel (Asst. Prof., Baylor College of Medicine) 2013–2015
Phillip Grimaldi (Research Director at OpenStax) 2013–2015
Eric Chi (Asst. Prof., North Carolina State University, NSF CAREER Award) 2013–2015
Mohammad Golbabaee (Postdoc, University of Edinburgh) 2013–2015
Divyanshu Vats (Two Sigma, New York) 2012–2014
Tom Goldstein (Asst. Prof., University of Maryland, Sloan Fellow, DARPA Young Faculty Award) 2012–2014
Jianing Shi (Varian Medical Systems) 2011–2013
Christoph Studer (Asst. Prof., Cornell, NSF CAREER Award) 2011–2013
Aswin Sankaranarayanan (Asst. Prof., CMU, NSF CAREER Award) 2009–2012
Arian Maleki (Asst. Prof., Columbia University) 2010–2012
Jarvis Haupt (Assoc. Prof., U. Minnesota, DARPA Young Faculty Award) 2009–2010
Volkan Cevher (Assoc. Prof., EPFL, EU ERC Award, IEEE SPS Best Paper Award) 2007–2009
Petros Boufounos (Mitsubishi Electric Research Lab, MERL) 2006–2008
Christopher Rozell (Assoc. Prof., Georgia Institute of Technology, NSF CAREER Award, Sigma Xi Young Faculty Research Award) 2006
Dror Baron (Assoc. Prof., NCSU) 2003–2006
Veronique Delouille (Royal Observatory of Belgium) 2003–2004
Rutger van Spaendonck (Shell Research, Netherlands) 2002–2003
Xin Wang (Bell Labs) 2001–2002
Maarten Jansen (Assoc. Prof., Tech. Universit Libre de Bruxelles, Belgium) 2000–2001
Vidya Venkatachalam (MathSoft, Seattle) 2000
Mark Coates (Assoc. Prof., McGill University) 1999–2002
Hyeokho Choi (Asst. Prof., North Carolina State University) 1998–2000
Ivan Magrin-Chagnolleau (INRIA, Lyon, France) 1998–1999
Rolf Riedi (Assoc. Prof. of Statistics, Rice, now Professor at U. Applied

Sciences of Western Switzerland) 1997–1999
 Philippe Steeghs (Department Manager, TNO, Netherlands) 1997–1999
 Jan Odegard (Executive Director, K2I, Rice) 1996–1997
 Robert Nowak (McFarland-Bascom Professor, University of Wisconsin, NSF CAREER Award, ARO YIP Award, ONR YIP Award, IEEE Baker Paper Award, IEEE SPS Young Author Best Paper Award, IEEE SPS Best Paper Award, ASPRS Talbert Abrams Paper Award, GE Genius of Invention Award, IEEE Fellow) 1995–1996
 Paulo Gonçalves (Director de Recherche, Ecole Normale Supérieure, Lyon, France) 1994–1996

PhD student
 alums:

Christopher Metzler (2018, now postdoc at Stanford University, NDSEG, NSF, and K2I Fellow)
 Ali Mousavi (2018, now in Google AI Residency Program, Schlumberger Fellow)
 Amirali Aghazadeh (2017, now postdoc at Stanford University, Hershel Rich Invention Award)
 Andrew Lan (2016, postdoc at Princeton University and OpenStax, now Asst. Prof. at U. Mass-Amherst)
 Eva Dyer (2014, NSF Graduate Fellow, postdoc at Northwestern University, now Asst. Prof. at Georgia Tech, Allen Institute Next Generation Leader Award, Sloan Fellow)
 Andrew Waters (2014, H. Butler Award, now Machine Learning Lead at OpenStax)
 Chinmay Hegde (2012, Budd award for best engineering thesis, postdoc at MIT, now Asst. Prof. at Iowa State University, NSF CISE Research Initiation Initiative (CRII) Award, NSF CAREER Award)
 Jason Laska (2012, Herschel Rich Invention Award, Computer Vision Lead at Dropcam/Nest, now at Clara Labs)
 Mona Sheikh (2010, now postdoc at Whitehead Institute for Biomedical Research, MIT)
 Mark Davenport, (2010, Hershel Rich Invention Award, Budd Award for best engineering thesis, NSF Math Sciences postdoc fellow at Stanford, now Assoc. Prof. at Georgia Tech, NSF CAREER Award, AFOSR YIP Award, Sloan Fellow)
 Marco Duarte (2009, Hershel Rich Invention Award, NSF IPAM postdoc fellow at Princeton/Duke, IEEE SPS Best Overview Paper Award, now Assoc. Prof. at U. Mass-Amherst)
 Shriram Sarvotham (2008, now at Apple)
 Raymond Wagner (2007, now at NASA Johnson Space Center)
 Michael Wakin (2006, NSF Graduate Fellow, Hershel Rich Invention Award, NSF Math Sciences postdoc fellow at Caltech, Asst. Prof. at U. Michigan, now Assoc. Prof. at Colorado School of Mines, NSF CAREER Award, DARPA Young Faculty Award)
 Vinay Ribeiro (2005, now Assoc. Prof. at IIT-Delhi)
 Nadeem Ahmed (2004, now VP at AxilPartners)
 Justin Romberg (2003, now Prof. at Georgia Tech, ONR YIP, PECASE, Packard Fellowship, Rice Outstanding Young Engineering Alumnus)
 Ramesh Neelamani (2003, now at ExxonMobil Research, SEG Karcher Award)
 Tim Dorney (2001, now at Texas Instruments)
 Rohit Gaikwad (2000, Herschel Rich Invention Award, Budd award for best engineering thesis, now Broadcom Fellow)
 Roger Claypoole (1999, Prof. at Air Force Institute of Technology, now at TASC)
 Matthew Crouse (1999, Budd award for best engineering thesis, IEEE Signal

Processing Society Best Student Paper Award, now hedge fund manager)

- MS student alums: Dante Soares (2014, now at OpenStax)
Stephen Schnelle (2011, NSF and NDSEG Graduate Fellow, now at Northrop-Grumman)
Sriram Nagaraj (2011, now at Indian Institute of Sciences)
Manjari Narayan (2011, Google Anita Borg Scholarship)
Ryan King (2007, now at WesternGeco)
William Chan (2006, now at CGGVeritas)
Shridar Lavu (2004, now at NVIDIA)
Brent Hendricks (2000, Systems Architect, Connexions, Rice)
Metin Bayram (1996, now at TrellisWare)
- Undergrad alums: Venkat Chandrasekaran (2005, PhD from MIT, postdoc at UC-Berkeley, now Prof. at Caltech)
Laura Balzano (2002, PhD from U. Wisconsin, now Asst. Prof. at U. Michigan)
Shannon Hughes (1999, PhD from Princeton, now Asst. Prof. at UC-Boulder)
Maya Gupta (1997, PhD from Stanford, now Assoc. Prof. at U. Washington, NSF Graduate Fellow, ONR Young Investigator Award, PECASE Award)
- External theses: Marwa El Halabi (EPFL, Switzerland)
Nicolas Ducros (University of Lyon, France)
Suman Maji (University of Bordeaux, France)
Graeme Pope (ETH, Switzerland)
Yaser Eftekhari (Carleton, Canada)
Mohammad Golbabaee (EPFL, Switzerland)
Ali Hormati (EPFL, Switzerland)
Vladan Velisavljevic (EPFL, Switzerland)
Felix Friedrich (Technical Universitat Munchen, Germany)
Rosa Figueras Ventura (EPFL, Switzerland)
James Carson (Baylor College of Medicine)
Antoine Roueff (Ecole Nationale Supérieure d'Ingénieurs Electriciens, Grenoble)
Pier Luigi Dragotti (EPFL, Switzerland)
Minh Do (EPFL, Switzerland)
Pierre Chenais (ENS-Lyon, France)
Rutger van Spaendonck (Delft University of Technology, Netherlands)
Eric Chassande-Motin (ENS-Lyon, France)
Philippe Steeghs (Delft University of Technology, Netherlands)
Dominique Devedeux (Université de Technologie de Compiègne, France)

ACTIVITIES OUTSIDE RICE UNIVERSITY

- Editorial Board: *SIAM Journal on Imaging Sciences* (2019–2022)
IEEE Journal on Selected Areas in Information Theory (2019–present)
Applied and Computational Harmonic Analysis (1999–present)
IEEE Journal of Selected Topics in Signal Processing (2011–2014)
ACM Transactions on Sensor Networks (2006–2010)
- Advisory Board: Duke University ECE External Advisory Board (2012)
- Planning Committee: Center for Neuroengineering (Rice, BCM, UTHSC-H, UH)

- Guest Editor: *PNAS* special issue on the Science of Deep Learning, 2019
IEEE Journal of Selected Topics in Information Theory special issue on Deep Learning: Mathematical Foundations and Applications, 2019
Information and Inference special issue on the Theory of Deep Learning, 2019
The Leading Edge, special issue on Machine Learning for Geophysics, 2019
IEEE Journal of Selected Topics in Signal Processing, special issue on Signal Processing and Machine Learning for Education and Human Learning at Scale, 2016
IEEE Signal Processing Magazine special issue on Computational Photography and Displays, 2016
Proceedings of the IEEE special issue on Sparsity in Signal Processing, 2009
IEEE Journal of Selected Topics in Signal Processing special issue on Compressive Sensing, 2009
IEEE Signal Processing Magazine special issue on Compressive Sampling, 2008 (lead)
Proceedings of the IEEE special issue on Educational Technology, 2008
IEEE Signal Processing Magazine special issue on Signal Processing in Networking, 2002
- Co-organizer: NeurIPS Workshop on *Solving Inverse Problems with Deep Networks*, 2019
KDD Workshop on *Deep Learning for Education (DL4Ed)*, 2019
NIPS Workshops on *Integration of Deep Learning Theories and Machine Learning for Geophysical and Geochemical Signals*, 2018
SIAM Imaging Science Workshop on *Computational and Compressive Imaging Technology and Applications*, 2016, 2018
Math+X Symposium on *Data Science and Inverse Problems in Geophysics*, 2018
NIPS Workshop on *Advances in Modeling and Learning Interactions from Complex Data*, 2017
KDD Workshop on *Advancing Data with Education*, 2017
NIPS Workshop on *Machine Learning for Education*, 2016
ICML Workshop on *Machine Learning for Digital Education and Assessment*, 2016
ICML Workshop on *Machine Learning for Education*, 2015
IPAM Workshop on *Computational Photography and Intelligent Cameras*, 2015
NIPS Workshop on *Human Propelled Machine Learning*, 2014
IMA Workshop on *High Dimensional Phenomena*, 2011
Invited session on *Signal Processing* at First EU-US Frontiers of Engineering Symposium (NAE), 2010
NIPS Workshop on *Manifolds, Sparsity, and Structured Models: When Can Low-Dimensional Geometry Really Help?*, 2009
IPAM Workshop on *Mathematical Challenges and Opportunities in Sensor Networking*, 2007
Wavelet And Multifractal Analysis Summer School (WAMA), Institut d'Études Scientifiques de Cargèse, Corsica, France, 2004
Knowledge Held Hostage — Fair Use and IP Workshop, 2004
Numerous special sessions at ICASSP, ICIP, SPIE, Asilomar
- Program Committee: *Educational Data Mining (EDM)*, 2019
AISTATS, 2018, 2019
Neural Information Processing Systems (NIPS), 2016–2018

IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018
ACM/SIGKDD Conf. on Knowledge Discovery and Data Mining (KDD), 2017
SIAM Imaging Science Conference, Compressive Imaging Workshop, 2016
International Conference on Machine Learning (ICML), 2015
IEEE International Conference on Computational Photography (ICCP), 2015
European Conference on Computer Vision (ECCV), 2014
NATO SET-213 Specialist Meeting on Compressive Sensing for Radar and IR Imaging, 2014
SPARC Open Access Meeting, 2014
SPARS, 2013, 2015
IEEE International Symposium on Information Theory (ISIT), 2012, 2009
AAAI Symposium on Manifold Learning and its Applications, 2010
SPIE Photonics West Conference on Emerging DLP Chip-Based Systems and Applications, 2008
 Co-Technical Program Chair, *IEEE Statistical Signal Processing Workshop*, Madison, 2007
Information Processing in Sensor Networks (IPSN), 2005, 2006, 2008
SPIE Conference on Intelligent Integrated Microsystems, 2006
International Conference on Mathematical Knowledge Management, 2005
International Conference on Computational Harmonic Analysis, 2004
SPIE Wavelet Applications in Signal and Image Processing Annual Conference, 1998–2008
IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis, 1998

Chair: IEEE Signal Processing Society, Houston Chapter, 1994–2015

Member: IEEE Richard W. Hamming Medal Committee, 2018
 IEEE Signal Processing Society Education Technical Committee, 2010–2014
 Lensing Oversight Committee for IEEE Signal Processing Society / Connexions joint project, 2007–2009
 UNESCO Consultative Committee on Open Educational Resources, 2007
 IEEE Signal Processing Society Technical Committee on Signal Processing Theory and Methods, 1998–2004
 Jury, Eta Kappa Nu C. Holmes MacDonalld Outstanding Teaching Award, 2004

Gov't panels: Delegate to International Seminar on “Scientific Publication: Where, Why, How” organized by Russian Academy of Sciences, US Embassy, and US National Academy of Sciences, Moscow, 2017
 DOE Technical Working Group, Higher Education National Educational Technology Plan, 2016
 NOAA Science Advisory Board, 2015
 White House Symposium on Innovation in Higher Education, 2014
 Irish National Academy for Integration of Research, Teaching and Learning (NAIRTL) International Advisory Board, 2010–present
 DARPA Information Science And Technology Study Group (ISAT), 2008–2011
 State of Washington House Higher Education Committee on Open Textbooks, 2009
 Open Education Subcommittee of the Virginia Joint Commission on Science and Technology, 2008

Advisory Committee on Student Financial Assistance, US Congress, 2007

Invited Participant: National Academies Keck Futures Initiative (NAKFI) Conference on *The Informed Brain in a Digital World*, 2012
 Atlantic Magazine *Washington Ideas Forum* Working Summit on America's Culture of Innovation, 2010
Cape Town Declaration Framing Workshop, South Africa, 2007
 European Commission Workshop on *Knowledge Anywhere Anytime*, 2004
 NAE Workshop on *IT-Enabled Educational Materials*, 2002
 Numerous NSF review panels

Reviewer: *Science, Nature, PNAS, various IEEE Transactions, etc.*

ACTIVITIES WITHIN RICE UNIVERSITY

2017 Founder, ML@RICE workshop

2016–2018 Faculty Search Committee, ECE (Chair)

2016–present Data Science Programming and Search Committee

2015–present Digital Education Advisory Committee

2015 K2I Internal Review Committee

2014–2015 Faculty Search Committee, Computer Science

2013–2014 Organizing Committee for 2014 Delange Conference on *Teaching in the Research University of Tomorrow*

2013–present Personalized Learning Workshop (Founder, Co-Organizer)

2011–present Member of Scientia

2010 Organizing Committee for 2012 Delange Conference on *The Future of the Research University in a Global Setting*

2009–present Rice Center for Engineering Leadership (RCEL), Internal Advisory Committee

2008–2012 Co-Chair, ECE Faculty Search Committee

2006–present Chair, Texas Instruments Visiting Professor Committee

2004–2008 ECE Industrial Affiliates Committee

2004–2008 Cain Project Faculty Advisory Committee

2000 Rice Web Steering Committee

2000 Committee on the Digital Environment at Rice

1999 *DSP30 Celebration* Organization Committee (Chair)

1997 Dean's Committee on Departmental Structure

1996–2004 Chair, ECE Graduate Committee

1996–present Texas Instruments Graduate Fellowship Committee

1996–2000 University Committee on Admission and Student Financial Aid

1994–2008 KTRU Radio DJ

1994–2008 Faculty Associate and Divisional Advisor, Hanszen College
 (Outstanding Associate 1995–1997)

1994–1996 ECE Graduate Committee

1994–1996 IEEE Student Branch Faculty Advisor

1994–1995 Faculty Mentor, Minority Student and "Posse" Programs

1993–1994 ECE Curriculum Committee

1993–present ECE Graduate Committee

TEACHING

ELEC 475/575	Learning from Sensor Data (developed)
ELEC 301x	Discrete Time Signals and Systems (MOOC developed for edX, 2014)
ELEC 301	Signals, Systems, and Learning
ELEC 431	Digital Signal Processing (developed)
ELEC 532	Spectral Analysis (developed)
ELEC 539	Image Processing
ELEC 631	Advanced Digital Signal Processing: Wavelets, Graphical Models, Compressive Sensing Manifolds in Signal Processing, Document Analysis, Reinforcement Learning
Instructor:	Dean's Teaching Workshop for New Faculty/TAs, 1997–2001, 2004–2007 James Baker Society, 2004 School of Continuing Studies, 2004, 2007, 2008 Alumni College, 1999 Science Academy of South Texas, 1999

PRESS

Recent press available at <http://goo.gl/vLVHZZ>

- 2006–present on Compressive Sensing and the Single-Pixel Camera: *MIT Technology Review TR10 Emerging Technologies for 2007*, *The Economist*, *Business Week*, *Scientific American*, *Nature Photonics*, *BBC News*, *BBC Digital Planet*, *MIT Technology Review* (twice), *USA Today*, *The Times*, *The Guardian*, *SIAM Review*, *EE Times*, *New Scientist* (twice), *IEEE Signal Processing Magazine*, *IEEE Spectrum*, *La Recherche (France)*, *MSN.com*, *TechRadar*, *Mechanical Engineering Magazine*, *Economic Times (India)*, *NAE Radio Series on Engineering*, *Houston Chronicle*, *Washington Post*, *Slashdot* (twice), *Digital Camera Info*, *Cellular News*
- 2003–present on Connexions: *Wall Street Journal*, *New York Times* (five times), *BusinessWeek*, *CNN.com*, *Nature*, *Newsweek*, *The Chronicle of Higher Education* (six times), *Inside Higher Ed* (eleven times), *Scientific American*, *Times Higher Education*, *Financial Times Higher Education (FHE)*, *US News and World Report*, *Forbes* (three times), *Washington Post*, *Wired* (twice), *The Guardian*, *Le Monde*, *International Herald Tribune*, *ASEE Prism* (twice), *eSchool News* (twice), *Campus Technology*, *San Francisco Chronicle*, *San Jose Mercury News*, *Los Angeles Times* (twice), *Ottawa Citizen*, *Eutopia* (twice), *The Book Standard*, *Wired News*, *Campus Technology* (twice), *The TakeAway* (BBC, *NY Times*, *WGBH*), *SURF (Netherlands)*, *EducationViews*, *Linux Insider*, *Linux Electrons*, *Houston Chronicle* (twice), *Houston Business Journal*, *KIKK Radio (CNN)*, featured on Intel's "What's Inside You?" website
- 2012–present on OpenStax: *New York Times*, *Forbes*, *TIME*, *Chronicle of Higher Education* (five times), *Inside Higher Education* (ten times), *Publishers Weekly*, *Campus Technology*, *San Jose Mercury News*, *Information Weekly*, *Kiplinger Finance*, *University Business*, *Voice of America News*, *KUHF*
- 2008 on the Cape Town Declaration on Open Education: *San Francisco Chronicle*, *Inside Higher Ed*, *The Chronicle of Higher Education*, *Newsweek*, *eSchool News*, *Mlada Fronta Dnes (Czech Republic)*, *Die Welt (Germany)*, *Kerdos (Greece)*, *Diena (Latvia)*, *Kronika (Romania)*, *Vedomosti (Russia)*, *El Pais (Spain)*, *Tagesanzeiger (Switzerland)*, *L'Agefi (Switzerland)*, *Norgesuniversitetet (Norway)*, *Today's Zaman (Turkey)*, *Clarín (Argentina)*, *Los Tiepos (Bolivia)*, *Valor (Brazil)*, *TioSam (Brazil)*, *La Tercera (Chile)*, *El Tiempo (Colombia)*, *Stabroek News (Guyana)*, *El Universal (Nicaragua)*, *El Neuvo Diario (Nicaragua)*, *La Prensa (Panama)*, *The Australian (Australia)*, *South China Morning Post (Hong*

Kong), The Nation (Thailand), The Japan Times (Japan), The Korean Herald (Korea), Macau Daily Times (Macau), The Press (New Zealand), The Timaru Herald (New Zealand), Daily Times (Pakistan), Daily Enquirer (Philippines), Taipei Times (Taiwan), The Nation (Thailand), Al Jarida (Kuwait), Al Arab (Qatar) Le Quotodien d'Oran (Algeria), Mmegi (Botswana), Daily Star (Egypt), Les Nouvelles (Madagascar), Les Echos (Mali), Standard Times (Sierra Leone)

PRESENTATIONS

Keynote and Plenary Lectures

- 2019 “Multiscale Deep Learning,” *Wavelets and Beyond – A Celebration for Alexandre Grossmann and Yves Meyer*, Orsay, France, June 2019
- “Deep Inverse,” *NATO Science and Technology Organization Specialists Meeting*, Salamanca, Spain, May 2019
- “Machine Learning using Generative Models,” *Machine Learning in Solid Earth Geoscience*, Santa Fe, NM, March 2019
- 2018 “Deep Optimization,” *15th Workshop on Optimization and Inverse Problems in Electromagnetism (OIPE)*, Innsbruck, Austria, September 2018
- “Going Off the Deep End with Deep Learning,” *Miller Institute Interdisciplinary Symposium*, UC-Berkeley, June 2018
- “Going Off the Deep End with Deep Learning,” *Information Theory and Applications Workshop (ITA)*, San Diego, February 2018
- 2017 “Open Access Personalized Learning,” *Yidan Prize Summit*, Hong Kong, December 2017
- “Sparse Signal Processing,” *Institute for Operations Research and the Management Sciences (INFORMS) Annual Meeting*, Houston, October 2017
- “A Probabilistic Theory of Deep Learning,” *National Conference on Communications (NCC)*, Madras, India, March 2017
- “Cape Town+10 Keynote Panel,” *OpenEd Global*, Cape Town, South Africa, March 2017
- “A Probabilistic Theory of Deep Learning,” *Coordinated Science Laboratory Student Conference*, University of Illinois at Urbana-Champaign, February 2017
- 2016 “OpenStax: An Open Education Case Study,” *Education 20/20: Innovative Teaching and Learning at a Distance*, University of Houston, November 2016
- “Going off the Deep End with Deep Learning,” *ExxonMobil Cognitive Computing Conference*, March 2016
- “Computational Nonsensing,” *Conference on Computational Imaging and Vision (CIV)*, KAUST, Saudi Arabia, March 2016
- 2015 “A Probabilistic Theory of Deep Learning,” *Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Cancun, Mexico, December 2015
- “Personalized Education,” *Xconomy Houston 2035*, May 2015
- “Progress on Sparse Signal Processing,” *Sampling Theory and Applications (SampTA)*, Washington, DC, May 2015
- “Scaling Up Quality Education,” *Blended Learning in the Liberal Arts Conference*, Bryn Mawr College, May 2015

- “Open Education: Challenges and Opportunities in Signal Processing,” *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Brisbane, Australia, April 2015
- “Compressive Nonsensing,” Norbert Wiener Colloquium, Department of Mathematics, University of Maryland, College Park, February 2015
- 2014 “Open Education - A Disruptive Force in Education,” *UBTech*, Las Vegas, July 2014
- “Compressive Nonsensing,” *ATO SET-213 Specialist Meeting on Compressive Sensing for Radar/SAR and EO/IR Imaging*, Tallinn, Estonia, May 2014
- “Sparse Signal Processing,” *Technion Computer Engineering (TCE) Center Conference*, Technion, Haifa, Israel, May 2014
- “Open Source = Open to You: Online Publishing,” 10th Annual Innovations in Health Science Education, Austin, February 2014
- “OpenStax College — Modern Textbooks,” Panel on The Next Edition of Digital Textbooks and Courseware, TransformingEDU Summit, *Consumer Electronics Show*, Las Vegas, January 2014
- “Keypoint Articulation Manifolds for Image Analysis in High Dimensions,” *French-German Conference on Mathematical Image Analysis*, Paris, France, January 2014
- 2013 “Video Compressive Sensing,” *Matheon Workshop on Compressed Sensing and its Applications*, Berlin, December 2013
- “Learning Near-Isometric Linear Embeddings,” *IEEE GlobalSIP*, Austin, TX, December 2013
- “Intellectual Infrastructure for Lifelong Learning,” *OKMD Knowledge Festival*, Bangkok, Thailand, December 2013
- “Open E-Courses: New Ways to Develop and Share,” *11th Seminar on E-Learning*, King Khalid University, Abha, Saudi Arabia, October 2013
- “A Perfect Storm for Open Education,” *UW Annual Conference on Distance Teaching and Education*, University of Wisconsin, August 2013
- “Learning Near-Isometric Linear Embeddings,” *SPARS Workshop*, EPFL, Lausanne, Switzerland, July 2013
- “Personalized Learning Systems — Worthy of the Hype?” *SXSWedu*, Austin, TX, March 2013
- “Video Compressive Sensing,” *BASP Frontiers Workshop*, Switzerland, January 2013
- 2012 “Disruptive Innovation via Open Educational Resources,” Distinguished Lecture, Department of Electrical and Computer Engineering, Duke University, November 2012
- “A Perfect Storm for Open Education,” Telefonica TIC Forum, Santiago, Chile, November 2012
- “Compressive Sensing: 8 Years Later,” *46th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 2012
- “A Perfect Storm for Open Education,” *FLASH Annual Conference*, Orlando, November 2012
- “A Perfect Storm for Open Education,” *Frontiers of Engineering Education*, National Academy of Engineering, Irvine, CA, October 2012
- “Optimization based Sparse Signal Recovery,” *21st International Symposium on Mathematical Programming (ISMP 2012)*, Berlin, August 2012
- “Compressive Signal Processing,” *Center for Advanced Signal and Image Science (CASIS) Workshop*, Lawrence Livermore National Laboratory, May 2012

- “Compressive Signal Processing,” *Mohammed Dahleh Distinguished Lecture*, UCSB, May 2012
- “Open Education: A Disruptive Force in Education,” *California Community College Association for Occupational Education (CCCAOE) Spring Conference*, San Francisco, March 2012
- 2011 “Open Technology / Open Education,” *IASTED International Conference on Technology and Education (TE 2011)*, Dallas
- “Open Source Education,” *Pearson Technology Summit*, Denver
- “The Open Education (R)Evolution,” National Council for Workforce Education and National Council for Continuing Education and Training joint summit on *Growing the Workforce for a New American Economy*, St. Louis
- “Randomized Dimensionality Reduction and Compressive Sampling,” Padovani Lecture, *Information Theory School*, IEEE Information Theory Society
- “Compressive Sensing and Signal Processing,” *University of Delaware Distinguished Lecture Series*
- “The Past, Present, and Future of Open Education Resources: Implications for Campus Stores” *Campus Market Expo (CAMEX)*, Houston
- “Open Education: Past, Progress, and Challenges,” *EDUCAUSE Learning Initiative Conference*, Washington, DC
- 2010 “The Open Education Revolution,” *Irish National Academy for Integration of Research, Teaching and Learning (NAIRTL) and Learning Innovation Network (LIN) joint annual conference*, Dublin
- “Open Education: A New Avenue for Educational Innovation,” *Romania Education Forum*, Bucharest
- “Open Education: Past, Present, and Future,” *UNESCO Brazil OER Workshop*, Brasilia
- 2009 “The Open Education Revolution,” *De Onderwijsdagen 2009 (Education Days)*, Utrecht, Netherlands
- “The Open Education Revolution,” *Brazilian Workshop on Challenges and Perspectives of Open Educational Resources*, Sao Paulo
- “From Open Education to Textbooks of the Future,” *International Society for the Scholarship of Teaching and Learning*, Bloomington.
- “Connexions: Building Communities and Sharing Knowledge,” *Maryland Association of Boards of Education Annual Conference*, Ocean City.
- “Open Education in the Western World,” *The Guardian Activate Summit*, London, UK.
- “Randomized Dimensionality Reduction: A New Framework for Signal Processing and Communications,” *IEEE International Symposium on Information Theory (ISIT)*, Seoul, Korea.
- “Open Education Unleashed,” *Canadian eLearning Conference*, Vancouver.
- “Open Access Learning,” *Canadian Learning Commons Conference*, Saskatoon, Saskatchewan.
- “The Open Education Revolution,” *Making Opportunity Affordable Opportunity Grant Program Academy*, Denver.
- “Open Educational Resources: A Modern Approach to Teaching and Learning,” *Republic of Poland Parliament Special Conference on Open Education*, Warsaw.
- “The Emerging Economics of Open Access Education,” *eTech Ohio*, Columbus
- 2008 “Compressive Sensing Theory and Applications,” *IMA (UK) Conference on Mathematics of Signal Processing VIII*, Cirencester, UK.

- “Exploiting Sparsity through Compressive Sampling,” *Workshop on Sparsity and its Application to Large Inverse Problems*, Robinson College, Cambridge University.
- “Open Access Textbooks,” *Online Educa Berlin 2008*, Berlin
- “Open Access Education — Building Communities and Sharing Knowledge,” *AACE E-Learn Conference*, Las Vegas
- “Open Access Education — Building Communities and Sharing Knowledge,” *National School Boards Association Annual Meeting*, Seattle.
- “The Open Education Movement: Transforming the Economics and Ecology of Education,” *Distinguished Lecture Series of the Texas Language Technology Center (TLTC)*, University of Texas, Austin
- “Open Access Education: Building Communities and Sharing Knowledge,” National Education Computing Conference, San Antonio, TX
- “Distributed Compressive Sensing,” *Sensor, Signal, and Information Processing Workshop*, Sedona, AZ.
- “Open Access Education: Building Communities and Sharing Knowledge,” *Innovations in Online Learning Conference*, Austin.
- “An Introduction to Compressive Sensing,” DARPA IPTO Retreat, Annapolis, MD.
- “Compressive Sensing, Wavelets, and Sparsity,” *SPIE Defense + Security* (acceptance speech for SPIE Wavelet Pioneer Award), Orlando.
- “Connexions and Open Access Textbooks,” *Teaching and Learning with Technology Conference*, University of North Carolina, Raleigh.
- “Compressive Signal Processing,” *42nd Conference on Information Sciences and Systems (CISS)*, Princeton.
- “The Open Access Textbook Revolution,” *Independent College Bookstore Association Annual Meeting*, Destin, FL.
- “A Single-Pixel Camera based on TI DLP Technology,” Keynote Demo at the *Texas Instruments Developers Conference*, Dallas (with Kevin Kelly).
- “Connexions — Education for a Networked World,” *The UP Experience*, Houston.
- “Compressive Signal Processing,” *IAM-PIMS-MITACS Distinguished Colloquium Series*, UBC, Vancouver.
- 2007 “Compressive Sensing: A New Framework for Computational Data Acquisition,” *CAMSAP (Computational Advances in Multi-Sensor Adaptive Processing)*, St. Thomas, Virgin Islands.
- “Connexions and the Open Access Educational Publishing Revolution,” *EdNET Conference*, Chicago.
- “Compressive Imaging for Vision Applications,” *National Instruments Vision Summit*, Austin.
- “Compressive Detection and Estimation via Smashed Filtering,” *AMS 2007 von Neumann Symposium on Sparse Representation and High-Dimensional Geometry*, Snowbird.
- “Compressive Imaging,” *International Imaging Industry Association (I3A) 61st Annual Conference*, Denver.
- “Connexions – Building Sustainable, Global Educational Communities,” *Innovations in Education for India, China, and America*, Emory University, Atlanta.
- “Connexions: An Open-Access Education Case Study,” *Educause Annual Meeting*, Atlanta.

- 2006 “Connexions: Open Access Engineering Curricula,” *ASEE Global Colloquium on Engineering Education*, Rio de Janeiro, Brazil
- “Collaborative and Distributed Signal Processing in Sensor Networks,” *IEEE Digital Signal Processing Workshop*, Jackson Lake Lodge Grand Teton National Park.
- “Multiscale Compressive Sensing of Image Ensembles,” *EPFL Bernoulli Center Workshop on Wavelets and Applications*, Lausanne, Switzerland.
- “Connexions and the Open-Access Education Revolution,” *TED – Technology, Entertainment, and Design*, Monterey. (1 million views as of May 2018)
- 2005 “Connexions – Building Communities and Sharing Knowledge in Educational Leadership,” *National Council of Professors of Educational Administration 59th Annual Conference*, Washington, DC.
- “Open-Access Publishing in Education — Building Communities and Sharing Knowledge,” *Maricopa Community Colleges Ocotillo Retreat*, Phoenix.
- “COMPASS: A Multiscale Sensor Network Architecture for Distributed Data Processing,” *IEEE Sensor, Signal and Information Processing Workshop*, Tempe.
- 2002 “Connexions – Education for a Networked World,” *IEEE Digital Signal Processing Workshop*, Callaway Gardens.
- 2001 “Traitement des Images Multiechelle,” *Symposium GRETSI '01 sur le Traitement du Signal et des Images*, Toulouse, France.
- “Connexions and Educational Leadership,” *National Council of Professors of Educational Administration 55th Annual Conference*, Houston.
- “Besov, Bayes, and Plato,” *Nonlinear Estimation and Classification Workshop*, Mathematical Sciences Research Institute (MSRI), University of California-Berkeley
- 1996 “Modern Time-Frequency Analysis,” *Dynamics Days*, Lyon, France.
- “Linear and Quadratic Time-Frequency Representations,” *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Paris, France.

Invited Lectures

- 2019 Arizona State University; Alan Turing Institute (UK); Simons Institute at UC-Berkeley
- 2018 Royal Society Workshop on Light Transport and Imaging through Complex Media; Simons Foundation Math + X Symposium on Seismology and Inverse Problems; Harvard Data Science Initiative; Columbia University Data Science Initiative; SPE GCS Data Science Convention; EPFL (2); Google Multimodal Machine Learning Workshop
- 2017 National Technical University of Athens, Greece; Future of Signal Processing Workshop, MIT; Simons Foundation Math+Stats+X Conference, Stanford; Analog Devices; Milestone Integration Platform Symposium; University of Manitoba; Schlumberger
- 2016 Learning Summit, Stanford University; Stanford Center for Image Systems Engineering
- 2015 Caltech; UC-Berkeley; IPAM Workshop on Computational Photography and Intelligent Cameras (UCLA); ICDM Workshop on Data Mining for Educational Assessment and Feedback (ASSESS 2015); NIPS Workshop on Multiresolution Methods for Large Scale Learning; NIPS Workshop on BigNeuro 2015: Making Sense of Big Neural Data
- 2014 SPARC Open Access Meeting; University of Houston Image Analysis Seminar; Educause, special session on Adaptive Learning

- 2013 Rice CEVE Seminar Series
- 2012 Consortium for School Networking (CoSN) Annual Conference, Washington, DC; Shell Research
- 2011 Workshop on Sparse Statistics, Optimization and Machine Learning, Banff International Research Station, Canada; Workshop on Sparse and Low Rank Approximation, Banff International Research Station, Canada; Learning Workshop (aka “Snowbird Workshop”), Fort Lauderdale; Panelist on “Innovative Content: The Future is Here Today,” at Council of Chief State School Officers *National Conference on Student Assessment*, Orlando; Rice Education Entrepreneurship Program (REEP) Summer Institute; Panelist at Academy of Management “Exploratory Caucus Session on Open Education,” San Diego; SEG Workshop on Compressive Sensing, San Antonio; Open Language Summit, UT-Austin; UCLA
- 2010 ExxonMobil Upstream Research; NASA Johnson Space Center; University of Houston; Lawrence Livermore National Laboratory; M. D. Anderson Cancer Center; Computing Research Association annual meeting on “Peer Review and the Computing Sciences”; Park City Mathematics Institute (Institute for Advanced Study, Princeton University); Rice Alliance – Austin Chapter Distinguished Professor Lecture; Association of American Publishers Annual Conference Oxford Debate on Intellectual Property (thrown under the bus by Lawrence Lessig against William Strong and Allan Adler)
- 2009 Invited panelist at SPARC-ACRL Forum on the transformative potential of Open Educational Resources
- 2008 U. British Columbia; Microsoft Research; IMA (U. Minnesota); Invited tutorial at *EUSIPCO*, Lausanne; Joint ICML, UAI, and COLT workshops, Helsinki, Finland; *Azriel Rosenfeld Distinguished Lecture Series in Vision and Graphics*, University of Maryland; Tutorial on “Compressive Sensing Theory and Applications” at *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Las Vegas; Short course on “Compressive Sampling: Theory and Applications” at *SPIE Defense+Security*, Orlando; Invited panelist on “Textbooks of the Future: Free and Collaborative!” at *South-by-Southwest*, Austin; Short course on “Compressive Sampling” at UCSD Workshop on *Information Theory and its Applications (ITA)*, San Diego
- 2007 UCSD Workshop on Information Theory and its Applications; International Congress on Industrial and Applied Mathematics (Zurich); Southern Regional Education Board Educational Technology Cooperative; UIUC; Wolfram Research, National Science Teachers Association; Ukrainian Library Conference; IMA short course on “Compressive Sampling and Frontiers in Signal Processing” with E. Candes and R. DeVore
- 2006 IMA (U. Minnesota); TI Developers Conference; Google Michigan State; Boston U.; U. Toledo; Los Alamos National Laboratory; AMD Global Vision Conference; Tutorial on “Compressed Sensing: A New Framework for Sparse DSP” at *IEEE International Conference on Image Processing (ICIP)*, Atlanta; Connexions workshops in Hanoi and Ho Chi Minh City, Vietnam
- 2005 IMA (U. Minnesota); Fashion Institute of Technology; CMU; UC-Berkeley UCB MSRI; TI Developers Conference; ExxonMobil; NLIH Conference; USC Annenberg Center; ConocoPhillips; Texas Instruments
- 2004 MIT; UCLA IPAM; UC-Berkeley; UBC; BCcampus; U. Wisconsin; UNC SAMSI; TI Developers Conference; *Open Knowledge and Social Research Networks Workshop*, Stanford Humanities Center; IHP Summer School on *Multiscale Geometric Data Representation – Complexity, Analysis and Applications*, ETH-Zurich; *Wavelet and Multiscale Methods Workshop*, Oberwolfach, Germany; *Second International Conference on Computational Harmonic Analysis*, Vanderbilt University; *Multiscale Geometric Analysis Workshop*, University of Arkansas

- 2003 Princeton; U. Minnesota; U. Washington; Botanical Research Institute of Texas; TI; National Instruments; IBM Watson; Microsoft Research; NAS/Carnegie Workshop on *Transforming the Humanities*; *Applied Inverse Problems: Theoretical and Computational Aspects* Workshop; UCLA IPAM, Lake Arrowhead; *FNRS Wavelets and Applications Workshop*, Esneux, Belgium; *Wavelets and Statistics Workshop*, Grenoble, France; *Applicable Harmonic Analysis Workshop*, Banff International Research Station, Canada
- 2002 MIT; Caltech; INRIA Sophia-Antipolis (France); U. Cambridge; ETH Zurich; UC-Louvain-la-Neuve (Belgium); UNESCO; *Semester in Harmonic Analysis*, CEMRACS, Marseille, France
- 2001 Polytechnic; U. Manitoba; Dalhousie; ENST (Paris); U. Pierre et Marie Curie (Paris VI); Stavanger College (Norway); INRIA-Rennes (France); *Department of Communications Summer Research Institute*, EPFL, Switzerland; *Ideal Data Representation Workshop*, Institute for Mathematics and Applications (IMA), University of Minnesota; *Workshop on Analysis with Wavelets, Signals, and Geometry*, Center for Discrete Mathematics and Computer Science (DIMACS), Rutgers University
- 2000 U. Illinois; Princeton; Microsoft Research; Lucent Bell Labs; Houston Area Chapter of the American Statistical Association; Society of Rice University Women; Rice Graduate Student Association Teaching Workshop; *Wavelet Applications in Signal Processing Mini-Symposium, Third European Congress of Mathematics*, Barcelona
- 1999 Hong Kong U. Science and Technology; Beijing U.; Tsinghua; Stanford; U. South Carolina; Ricoh Silicon Valley Research Center; Houston Area Chapter of the American Statistical Association; *Wavelets and Multiresolution Workshop*, Foundations of Computational Mathematics, City University of Hong Kong
- 1998 U. Edinburgh; Imperial College; U. Bristol; Cambridge; Nortel Networks (Harlow, UK); Schlumberger (Cambridge, UK); Picometrix; Nortel Networks; SBC Communications; Western Geophysical; Rice School of Continuing Studies; *Data Analysis Workshop*, Isaac Newton Institute, Cambridge University; *Swiss Science Foundation Wavelets and Applications Workshop*, Centro Stefano Franscini, Monte Verità, Ticino, Switzerland; *EC Summer School on Bayesian Signal Processing*, Isaac Newton Institute, Cambridge University; *International Conference on Wavelets and Multiscale Methods*, Tangers, Morocco
- 1997 INRIA Rocquencourt (France); Shell Research
- 1996 Michigan State; U. Houston; Technical University of Delft; U. Colorado; Halliburton Geophysics; Rockwell Euclid Laboratories; Texas Instruments; Mobil; Exxon; *NSF/ONR Workshop on Signal Processing for Manufacturing and Machine Monitoring*
- 1995 Schlumberger; Exxon; Western Geophysical; SRI International; Lawrence Livermore National Laboratory
- 1994 U. Michigan; *Thematic Days on Time-Frequency, Multiresolution, and Wavelets*, INSA Lyon, France
- 1993 U. Manitoba; U. Texas at Arlington; Telecom Paris; Technical University of Vienna; Western Atlas
- 1992 U. Wisconsin; Johns Hopkins; U. Utah; Ohio State

PATENTS

28 US and 6 foreign patents in signal processing and acquisition. Siemens has licensed 6 patents to support the integration of compressive sensing into their MRI scanners to radically speed up data acquisition in cardiac MRI and beyond. Startup InView has licensed 12 patents that form the foundation of their infrared imaging approach.

“Methods and Systems for Video Compressive Sensing for Dynamic Imaging,” US patent 9,552,658, issued 24 January 2017.

“Apparatus and Method for Compressive Imaging and Sensing Through Multiplexed Modulation,” US patent 9,124,755, issued 1 September 2015.

“Hot Spot Correction in a Compressive Imaging System,” US Patent 8,922,688, issued 30 December 2014.

“Method and Apparatus for Compressive Domain Filtering and Interference Cancellation,” US Patent 8,725,784, issued 13 May 2014.

“Adaptive Search for Atypical Regions in Incident Light Field and Spectral Classification of Light in the Atypical Regions,” US Patent 8,717,551, issued 6 May 2014.

“Dual-Port Measurements of Light Reflected from Micromirror Array,” US Patent 8,717,466, issued 6 May 2014.

“Method and Apparatus for On-Line Compressed Sensing,” US Patent 8,687,689, issued 1 April 2014.

“Low-Pass Filtering of Compressive Imaging Measurements to Infer Light Level Variation,” US Patent 8,570,406, issued 29 October 2013.

“Determining Light Level Variation in Compressive Imaging by Injecting Calibration Patterns into Pattern Sequence,” US Patent 8,570,405, issued 29 October 2013.

“Method And Apparatus For Signal Detection, Classification And Estimation From Compressive Measurements,” US Patent 8,483,492, issued 9 July 2013.

“Method and Apparatus for Signal Reconstruction from Saturated Measurements,” US Patent 8,456,345, issued 4 June 2013.

“Method and Apparatus for Compressive Imaging Device,” US Patent 8,199,244, issued 12 June 2012; US Patent 8,848,091, issued 30 September 2014; European Patent 1,880,524 issued 30 October 2013.

“Apparatus and Method for Compressive Sensing Radar Imaging,” US Patent 7,928,893, issued 19 April 2011.

“Method And Apparatus For Automatic Gain Control For Nonzero Saturation Rates,” US Patent 8,487,796, issued 23 February 2011.

“Method And Apparatus For Compressive Parameter Estimation And Tracking,” US Patent 8,566,053, issued 22 October 2010.

“Analog System for Computing Sparse Codes,” US Patent 7,783,459, issued 24 August 2010.

“Throughput Maximization in Wireless Communication Systems,” US Patent 7,522,657, issued 21 April 2009.

“Method and Apparatus for Distributed Compressed Sensing,” US Patent 7,271,747, issued 18 September 2007. US Patent 7,511,643, issued 31 March 2009.

“Signaling Techniques in Channels With Asymmetric Powers and Capacities,” US Patent 7,035,400, issued 25 April 2006.

“Spectral Optimization for Communication under a Peak Frequency-Domain Power Constraint,” US Patent 6,839,429 issued 4 January 2005.

“Spectral Optimization and Joint Signaling Techniques with Multi-line Separation in the Presence of Crosstalk,” US Patent 6,317,495 issued 13 November 2001.

“Spectral Optimization and Joint Signaling Techniques with Upstream / Downstream Separation for Communication in the Presence of Crosstalk,” US Patent 6,292,559 issued 18 September 2001.

JOURNAL PUBLICATIONS

Google Scholar citation statistics: <http://scholar.google.com/citations?user=N-BBA20AAAAJ>
(H-index = 104, 55,500 citations as of April 2019)

Ranking of US/World Computer Scientists by H-index: <http://www.guide2research.com/scientists/US>
(#65 in US and #89 in World as of March 2019)

- E. L. Dyer, T. Goldstein, R. J. Patel, K. Kording, and R. G. Baraniuk, "Self-Expressive Decompositions for Matrix Approximation and Clustering," submitted to *IEEE Transactions on Signal Processing*, 2015.
- C. Studer, T. Goldstein, W. Yin, and R. G. Baraniuk, "Democratic Representations," submitted to *Applied and Computational Harmonic Analysis (ACHA)*, 2015.
- R. Balestriero and R. G. Baraniuk, "Mad Max: Affine Spline Insights into Deep Learning," *IMA Information and Inference*, special issue on Theory of Deep Learning, arXiv: 1805.06576, 2019.
- D. Sen, A. Aghazadeh, A. Mousavi, S. Nagarajaiah, R. G. Baraniuk, and A. Dabak, "Data-driven semi-supervised and supervised learning algorithms for health monitoring of pipes," to appear in *Mechanical Systems and Signal Processing*, 2019.
- M. K. Sharma, C. Metzler, S. Nagesh, R. G. Baraniuk, O. Cossairt, and A. Veeraraghavan, "Inverse Scattering via Transmission Matrices: Broadband Illumination and Fast Phase Retrieval Algorithms," *IEEE Transactions on Computational Imaging*, 2019.
- P. Grimaldi, D. Basu Mallick, A. E. Waters, and R. G. Baraniuk, "Do Open Educational Resources Improve Student Learning? Implications of the Access Hypothesis," *PLOS ONE*, 2019.
- J. Tan, L. Niu, J. K. Adams, V. Boominathan, J. T. Robinson, R. G. Baraniuk, and A. Veeraraghavan, "Face Detection and Verification Using Lensless Cameras with Application to the Internet of Things," *IEEE Transactions on Computational Imaging*, 2019.
- D. Sen, A. Aghazadeh, A. Mousavi, S. Nagarajaiah, and R. G. Baraniuk, "Sparsity-based Data-Driven Approaches for Damage Detection in Plates," *Mechanical Systems and Signal Processing*, Vol. 117, pp. 333–346, Feb. 2019.
- F. Litzinger, L. Boninsegna, H. Wu, F. Nske, R. Patel, R. G. Baraniuk, F. No, and C. Clementi, "Rapid Calculation of Molecular Kinetics using Compressed Sensing," *Journal of Chemical Theory and Computation*, Vol. 14, No. 5, pp. 2771–2783, May 2018.
- A. Aghazadeh, M. Golbabaee, A. S. Lan, and R. G. Baraniuk, "Insense: Incoherent Sensor Selection for Sparse Signals," *Signal Processing*, Vol. 150, pp. 57–65, 2018.
- A. Mousavi, A. Maleki and R.G. Baraniuk, "Consistent Parameter Estimation for LASSO and Approximate Message Passing," *Annals of Statistics*, Vol. 46, No. 1, pp. 119–148, 2018.
- J. K. Adams, V. Boominathan, B. W. Avants, D. G. Vercosa, R. G. Baraniuk, J. T. Robinson, and A. Veeraraghavan, "Single-Frame 3D Fluorescence Microscopy with Ultra-Miniature Lensless FlatScope," *Science Advances*, Vol. 3, No. 12, 8 December 2017.
- S. Asif, A. Ayremlou, A. Sankaranarayanan, A. Veeraraghavan, and R. G. Baraniuk, "FlatCam: Thin, Bare-Sensor Cameras using Coded Aperture and Computation," *IEEE Transactions on Computational Imaging* (special issue on Extreme Imaging), Vol. 3, No. 3, pp. 384–397, September 2017.
- A. S. Lan, A. E. Waters, C. Studer, and R. G. Baraniuk, "BLAh: Boolean Logic Analysis for Graded Student Response Data," *IEEE Journal of Selected Topics in Signal Processing* (special issue on Machine Learning for Education and Human Learning at Scale), Vol. 11, No. 5, August 2017.

- R. G. Baraniuk, S. Foucart, D. Needell, Y. Plan, M. Wootters, “One-Bit Compressive Sensing of Dictionary-Sparse Signals,” *Information and Inference: A Journal of the IMA*, August 2017.
- R. G. Baraniuk and T. P. H. Steeghs, “Compressive Sensing: A New Approach to Seismic Data Acquisition,” *The Leading Edge* (special issue on Compressive Sensing), August 2017.
- R. G. Baraniuk, S. Foucart, D. Needell, Y. Plan, M. Wootters, “Exponential Decay of Reconstruction Error from Binary Measurements of Sparse Signals,” *IEEE Transactions on Information Theory*, Vol. 63, No. 6, pp. 3368–3385, June 2017.
- A. Mirhoseini, E. Dyer, E. Songhori, R. G. Baraniuk, and F. Koushanfar, “RankMap: A Framework for Distributed Learning from Dense Datasets,” *IEEE Transactions on Neural Networks and Learning Systems*, May 2017.
- E. C. Chi, G. Allen, and R. G. Baraniuk, “Convex Biclustering,” *Biometric Methodology*, March 2017.
- R. G. Baraniuk, T. Goldstein, A. Sankaranarayanan, C. Studer, A. Veeraraghavan, and M. B. Wakin, “CS-Video: Algorithms, Architectures, and Applications for Compressive Video Sensing,” *IEEE Signal Processing Magazine*, Vol. 34, No. 1, pp. 52–66, January 2017.
- A. Aghazadeh, A. Y. Lin, M. A. Sheikh, A. L. Chen, L. M. Atkins, C. L. Johnson, J. F. Petrosino, R. A. Drezek, and R. G. Baraniuk, “Universal Microbial Diagnostics using Random DNA Probes,” *Science Advances*, vol. 2, 28 September 2016.
- V. Boominathan, J. K. Adams, S. Asif, B. Avants, J. T. Robinson, R. G. Baraniuk, A. C. Sankaranarayanan, A. Veeraraghavan, “Lensless Imaging: A Computational Renaissance,” *IEEE Signal Processing Magazine* (special issue on Computational Photography and Displays), Vol. 33, No. 5, pp. 23–35, September 2016.
- C. Metzler, A. Maleki, and R. G. Baraniuk, “From Denoising to Compressed Sensing,” *IEEE Transactions on Information Theory*, Vol. 62, No. 9, pp. 5117–5144, September 2016.
- T. Baran, R. G. Baraniuk, A. V. Oppenheim, P. Prandoni, M. Vetterli, “MOOC Adventures in Signal Processing: Bringing DSP to the Era of Massive Open Online Courses,” *IEEE Signal Processing Magazine*, Vol. 33, Issue 4, pp. 62–83, July 2016.
- J. P. Long, E. C. Chi, and R. G. Baraniuk “Estimating a Common Period for a Set of Irregularly Sampled Functions with Applications to Periodic Variable Star Data,” *The Annals of Applied Statistics*, Vol. 10, No. 1, pp. 165–197, January 2016.
- J. Chi, E. C. Chi, and R. G. Baraniuk, “ k -POD: A Method for Clustering Partially Observed Data,” *The American Statistician*, 2015.
- C. Hegde, A. Sankaranarayanan, W. Yin, and R. G. Baraniuk, “NuMax: A Convex Approach for Learning Near-Isometric Linear Embeddings,” *IEEE Transactions on Signal Processing*, Vol. 63, No. 22, pp. 6109–6121, November, 2015.
- T. Goldstein, L. Xu, Y. Li, K. F. Kelly, and R. G. Baraniuk, “The STOne Transform: Multiresolution Image Enhancement and Real-Time Compressive Video,” *IEEE Transactions on Image Processing*, Vol. 24, No. 12, pp. 5581–5593, December 2015.
- A. Sankaranarayanan, L. Xu, C. Studer, Y. Li, K. F. Kelly, and R. G. Baraniuk, “Video Compressive Sensing for Spatial Multiplexing Cameras using Motion-Flow Models,” *SIAM Journal on Imaging Sciences*, Vol. 8, No. 3, pp. 1489–1518, 2015.
- Y. Li, C. Hegde, A. C. Sankaranarayanan, R. G. Baraniuk, and K. F. Kelly, “Compressive Image Classification via Secant Projections,” *Journal of Optics*, Vol. 17, No. 6, April 2015.

- Y. Li, A. Sankaranarayanan, R. G. Baraniuk, and K. F. Kelly, "Realization of Hybrid Compressive Imaging Strategies," *Journal of the Optical Engineering Society A*, Vol. 31, No. 8, pp. 1716–1720, 2015.
- A. E. Waters, C. Studer, and R. G. Baraniuk, "Collaboration-Type Identification in Educational Datasets," *Journal of Educational Data Mining*, Vol. 6, No. 1, pp. 28–52, 2014.
- K. Fronczyk, A. E. Waters, M. Giuindani, R. G. Baraniuk, and M. Vannucci, "A Bayesian Nonparametric Approach for the Analysis of Multiple Categorical Item Responses," *Journal of Statistical Planning and Inference*, Vol. 166, pp. 52–66, July 2014.
- A. S. Lan, A. E. Waters, C. Studer, and R. G. Baraniuk, "Sparse Factor Analysis for Learning and Content Analytics," *Journal of Machine Learning Research*, Vol. 15, pp. 1959–2008, June 2014.
- T. Goldstein, B. Donoghue, S. Setzer, and R. G. Baraniuk, "Fast Alternating Direction Optimization Methods," *SIAM Journal of Imaging Sciences*, Vol. 7, No. 3, pp. 1588–1623, 2014.
- C. Studer, and R. G. Baraniuk, "Stable Restoration and Separation of Approximately Sparse Signals," *Applied and Computational Harmonic Analysis*, Vol. 37, pp. 12–35, 2014.
- K. Mitra, A. Sankaranarayanan, A. Veeraraghavan, and R. G. Baraniuk, "Multi-Camera Networks: From Compression to Compressive Sensing," *IEEE Computer* (special issue on Smart Camera Networks), Vol. 47, No. 5, pp. 52–59, 2014.
- S. Jalali, A. Maleki, and R. G. Baraniuk, "Minimum Complexity Pursuit for Universal Compressed Sensing," *IEEE Transactions on Information Theory*, Vol. 60, No. 4, pp. 2253–2268, April 2014.
- A. Butler, E. Marsh, J. P. Slavinsky, and R. G. Baraniuk, "Integrating Cognitive Science and Technology Improves Learning in a STEM Classroom," *Educational Psychology Review* (special issue on Cognitive Load Theory: A Broader View on the Role of Memory in Learning and Education), Vol. 26, No. 2, pp. 331–340, June 2014.
- S. Nagaraj, A. C. Sankaranarayanan, and R. G. Baraniuk, "A Theory for Optical Flow-based Transport on Image Manifolds," *Applied and Computational Harmonic Analysis*, Vol. 36, No. 2, pp. 280–301, March 2014.
- 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* (special issue on Signal and Image Processing in Hyperspectral Remote Sensing), Vol. 31, No. 1, pp. 116–126, January 2014.
- A. Maleki, M. Narayan, and R. G. Baraniuk, "Anisotropic Nonlocal Means Denoising," *Applied and Computational Harmonic Analysis*, Vol. 35, No. 3, pp. 452–482, November 2013.
- E. Dyer, A. Sankaranarayanan, and R. G. Baraniuk, "Greedy Feature Selection for Subspace Clustering," *Journal of Machine Learning Research*, Vol. 14, pp. 2487–2517, September 2013.
- A. C. Sankaranarayanan, P. Turaga, R. Chellappa, and R. G. Baraniuk, "Compressive Acquisition of Dynamic Scenes," *SIAM Journal of Imaging Sciences*, Vol. 6, No. 4, pp. 2109–2133, 2013.
- A. Maleki, L. Anatori, Y. Zai, and R. G. Baraniuk, "Asymptotic Analysis of Complex LASSO via Complex Approximate Message Passing (CAMP)," *IEEE Transactions on Information Theory*, Vol. 59, No. 7, pp. 4290–4308, July 2013.
- M. F. Duarte, M. B. Wakin, D. Baron, S. Sarvotham, and R. G. Baraniuk, "Measurement Bounds for Sparse Signal Ensembles via Graphical Models," *IEEE Transactions on Information Theory*, Vol. 59, No. 7, pp. 4280–4289, July 2013.

- L. Jacques, J. N. Laska, P. Boufounos, and R. G. Baraniuk, "Robust 1-Bit Compressive Sensing via Binary Stable Embeddings of Sparse Vectors," *IEEE Transactions on Information Theory*, Vol. 59, No. 4, pp. 2082–2102, April 2013.
- L. Anitori, A. Maleki, M. Otten, R. G. Baraniuk, and P. Hoogeboom, "Design and Analysis of Compressive Sensing Radar Detectors," *IEEE Transactions on Signal Processing*, Vol. 61, No. 4, pp. 813–827, April 2013.
- C. Hegde and R. G. Baraniuk, "Signal Recovery on Incoherent Manifolds," *IEEE Transactions on Information Theory*, Vol. 58, No. 12, pp. 7204–7214, December 2012.
- M. F. Duarte and R. G. Baraniuk, "Spectral Compressive Sensing," *Applied and Computational Harmonic Analysis*, Vol. 35, No. 1, pp. 111–129, July 2013.
- A. Maleki, M. Narayan, and R. G. Baraniuk, "Suboptimality of Nonlocal Means for Images with Sharp Edges," *Applied and Computational Harmonic Analysis*, Vol. 33, pp. 370–387, November 2012.
- P. Maechler, C. Studer, D. Bellasi, A. Maleki, A. Burg, N. Felber, H. Kaeslin, and R. G. Baraniuk, "VLSI Design of Approximate Message Passing for Signal Restoration and Compressive Sensing," *IEEE Journal on Emerging and Selected Topics in Circuits and Systems*, Vol. 2, No. 3, Oct. 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 Transactions on Signal Processing*, Vol. 60, No. 9, September 2012.
- J. N. Laska and R. G. Baraniuk, "Regime Change: Bit-Depth versus Measurement-Rate in Compressive Sensing," *IEEE Transactions on Signal Processing*, Vol. 60, No. 7, pp. 3496–3505, July 2012.
- M. F. Duarte and R. G. Baraniuk, "Kronecker Compressive Sensing," *IEEE Transactions on Image Processing*, Vol. 21, No. 2, pp. 494–504, February 2012.
- J. N. Laska, Z. Wen, W. Yin, and R. G. Baraniuk, "Trust, but Verify: Fast and Accurate Signal Recovery from 1-bit Compressive Measurements," *IEEE Transactions on Signal Processing*, Vol. 59, No. 11, November 2011.
- M. F. Duarte, G. Shen, A. Ortega, and R. G. Baraniuk, "Signal Compression in Wireless Sensor Data," *Philosophical Transactions of the Royal Society A* (special issue on Wireless Sensor Networks: Algorithms, Architectures and Applications), Nov. 2011.
- J. N. Laska, P. Boufounos, M. A. Davenport, and R. G. Baraniuk, "Democracy in Action: Quantization, Saturation, and Compressive Sensing," *Applied and Computational Harmonic Analysis*, Vol. 31, pp. 429–443, 2011.
- C. Hegde and R. G. Baraniuk, "Compressive Sampling of Pulse Streams," *IEEE Transactions on Signal Processing*, Vol. 59, No. 4, pp. 1505–1517, April 2011.
- L. Carin, R. G. Baraniuk, V. Cevher, D. Dunson, M. Jordan, G. Sapiro, M. B. Wakin, "Learning Low-Dimensional Signal Models," *IEEE Signal Processing Magazine* (special issue on Dimensionality Reduction via Subspace and Manifold Learning), Vol. 28, No. 3, pp. 39–51, March 2011.
- R. G. Baraniuk, "More is Less? Signal Processing and the Data Deluge," *Science*, Vol. 331 No. 6018, pp. 717–719, 11 February 2011.
- V. Cevher, P. Indyk, L. Carin, and R. G. Baraniuk, "Sparse Signal Recovery and Acquisition with Graphical Models," *IEEE Signal Processing Magazine* (special section on Major Advances in Graphical Modeling Technologies), Vol. 27, No. 10, pp. 92–103, October 2010.

- M. A. Davenport, C. Hegde, M. Duarte, and R. G. Baraniuk, "Joint Manifolds for Data Fusion," *IEEE Transactions on Image Processing* (special issue on Distributed Camera Networks), Vol. 19, No. 10, pp. 2580–2594, October 2010.
- V. Cevher, M. B. Wakin, and R. G. Baraniuk, "Low-Dimensional Models for Dimensionality Reduction and Signal Recovery: A Geometric Perspective," *Proceedings of the IEEE* (special issue on Sparsity in Signal Processing), Vol. 98, No. 6, pp. 959–971, June 2010.
- R. G. Baraniuk, V. Cevher, M. Duarte, and C. Hegde, "Model-based Compressive Sensing," *IEEE Transactions on Information Theory*, Vol. 56, No. 4, pp. 1982–2001, April 2010.
- M. A. Davenport, P. T. Boufounos, M. B. Wakin, and R. G. Baraniuk, "Signal Processing with Compressive Measurements," *IEEE Journal of Selected Topics in Signal Processing* (special issue on Applications of Compressive Sensing), Vol. 4, No. 2, pp. 445–460, April 2010.
Awarded IEEE Signal Processing Society Best Paper Award, 2015
- M. A. Davenport, R. G. Baraniuk, and C. Scott, "Tuning Support Vector Machines for Minimax and Neyman-Pearson Classification," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 32, No. 10, pp. 1888–1898, October 2010.
- J. A. Tropp, J. N. Laska, M. F. Duarte, J. K. Romberg, and R. G. Baraniuk, "Beyond Nyquist: Efficient Sampling of Sparse Bandlimited Signals," *IEEE Transactions on Information Theory*, Vol. 56, No. 1, pp. 520–544, January 2010.
- D. Baron, S. Sarvotham, R. G. Baraniuk, "Bayesian Compressive Sensing via Belief Propagation," *IEEE Transactions on Signal Processing*, Vol. 58, No. 1, pp. 269–280, January 2010.
- W. Dai, M. A. Sheikh, O. Milenkovic, and R. G. Baraniuk, "Compressive Sensing DNA Microarrays," *EURASIP Journal on Bioinformatics and Systems Biology*, January 2009.
- V. Chandrasekaran, M. B. Wakin, D. Baron, and R. G. Baraniuk, "Representation and Compression of Multi-Dimensional Piecewise Functions Using Surflets," *IEEE Transactions on Information Theory*, Vol. 55, No. 1, pp. 374–400, January 2009.
- R. G. Baraniuk, M. Davenport, R. A. DeVore, and M. B. Wakin, "A Simple Proof of the Restricted Isometry Property for Random Matrices," *Constructive Approximation*, Vol. 28, No. 3, pp. 253–263, December 2008.
- W. Chan, K. Charan, D. Takhar, K. F. Kelly, R. G. Baraniuk, and D. M. Mittleman, "A Single-Pixel Terahertz Imaging system based on Compressed Sensing," *Applied Physics Letters*, Vol. 93, No. 12, 2008.
- C. J. Rozell, D. H. Johnson, R. G. Baraniuk, B. A. Olshausen, "Neurally Plausible Sparse Coding via Thresholding and Local Competition," *Neural Computation*, Vol. 20, pp. 2526–2563, October 2008.
- R. Wagner, A. Cohen, and R. G. Baraniuk, "Approximation and Compression of Scattered Data by Meshless Multiscale Decomposition," *Applied and Computational Harmonic Analysis*, Vol. 25, Issue 2, pp. 133–147, September 2008.
- W. Chan, H. Choi, and R. G. Baraniuk, "Coherent Multiscale Image Processing using Dual-Tree Quaternion Wavelets," *IEEE Transactions on Image Processing*, 2008. Vol. 17, Issue 7, pp. 1069–1082, July 2008.
- C. M. Kelty, C. S. Burrus, and R. G. Baraniuk, "Peer Review Anew: Three Principles and a Case Study in Post-Publication Quality Assurance," *Proceedings of the IEEE* (special issue on Educational Technology), Vol. 96, No. 6, pp. 1000–1011, June 2008.
- W. Chan, M. L. Moravec, R. G. Baraniuk, and D. M. Mittleman, "Terahertz Imaging with Compressed Sensing and Phase Retrieval," *Optics Letters*, Vol. 33, No. 9, pp. 974–976, May 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* (special issue on Compressive Sampling), Vol. 25, No. 2, pp. 83–91, March 2008.
- R. G. Baraniuk and M. B. Wakin, "Random Projections of Smooth Manifolds," *Foundations of Computational Mathematics*, Vol. 9, No. 1, pp. 51–77, February, 2009.
- R. Neelamani, M. Deffenbaugh, and R. G. Baraniuk, "Texas Two-Step: A Framework for Optimal Multi-Input Single-Output Deconvolution," *IEEE Transactions on Signal Processing*, Vol. 16, Issue 11, pp. 2752–2765, November 2007.
- R. G. Baraniuk, "Compressive Sensing," *IEEE Signal Processing Magazine*, Vol. 24, No. 4, pp. 118–120, July 2007.
- R. Neelamani, S. Dash, and R. G. Baraniuk, "On Nearly Orthogonal Lattice Bases and Random Lattices," *SIAM Journal on Discrete Mathematics*, Vol. 21, No. 1, pp. 199–219, 2007.
- V. J. Ribeiro, R. H. Riedi, and R. G. Baraniuk, "Optimal Sampling Strategies for Multiscale Stochastic Processes," *Proceedings of Second Erich Lehman Symposium – Optimality*, Institute of Mathematical Statistics, Lecture Notes-Monograph Series, Volume 49, 2006.
- D. Baron and R. G. Baraniuk, "Faster Sequential Universal Coding via Block Partitioning," *IEEE Transactions on Information Theory*, Vol. 52, No. 4, pp. 1708–1710, April 2006.
- V. J. Ribeiro, R. H. Riedi, and R. G. Baraniuk, "Multiscale Queuing Analysis," *IEEE Transactions on Networks*, Vol. 15, No. 5, pp. 1005–1018, October 2006.
- V. Delouille, R. Neelamani, and R. G. Baraniuk, "Robust Distributed Estimation using the Embedded Subgraphs Algorithm," *IEEE Transactions on Signal Processing*, Vol. 54, No. 8, pp. 2998–3010, July 2006.
- M. Wakin, J. K. Romberg, H. Choi, and R. G. Baraniuk, "Wavelet-domain Approximation and Compression of Piecewise Smooth Images," *IEEE Transactions on Image Processing*, Vol. 15, No. 5, pp. 1071–1087, May 2006.
- R. Neelamani, R. de Queiroz, Z. Fan, S. Dash, and R. G. Baraniuk, "JPEG Compression History Estimation for Color Images," *IEEE Transactions on Image Processing*, Vol. 15, No. 6, pp. 1365–1378, June 2006.
- I. Selesnick, N. G. Kingsbury, and R. G. Baraniuk, "The Dual-Tree Complex Wavelet Transform – A Coherent Framework for Multiscale Signal and Image Processing," *IEEE Signal Processing Magazine*, Vol. 22, No. 6, pp. 123–151, November 2005.
- M. Jansen, R. G. Baraniuk, and S. Lavu, "Multiscale Approximation of Piecewise Smooth Two-Dimensional Functions using Normal Triangulated Meshes," *Applied and Computational Harmonic Analysis*, Vol. 19, No. 1, pp. 92–130, July 2005.
- S. Sarvotham, R. Riedi, and R. G. Baraniuk, "Network and User-Driven On-Off Source Model for Network Traffic," *Computer Networks* (special issue on Modeling Network Long Range Dependent Traffic: Characterization, Visualization, and Tools), Vol. 48, No. 3, pp. 335–350, 2005.
- V. J. Ribeiro, R. H. Riedi, and R. G. Baraniuk, "Locating Available Bandwidth Bottlenecks," *IEEE Internet Computing Magazine* (special issue on Measuring the Internet, Vol. 8, No. 5, pp. 34–41, September 2004.
- R. G. Baraniuk, C. S. Burrus, D. H. Johnson, and D. L. Jones, "Connexions – Sharing Knowledge and Building Communities in Signal Processing," *IEEE Signal Processing Magazine*, vol. 21, No. 5, pp. 10–16, September 2004.

- H. Choi and R. G. Baraniuk, "Multiple Wavelet Basis Image Denoising using Besov Ball Projections," *IEEE Signal Processing Letters*, Vol. 11, No. 9, pp.717–720, September 2004.
- R. V. Gaikwad and R. G. Baraniuk, "Joint Signaling Techniques and Spectral Optimization for Symmetric Bit-Rate Communication Over Self-NEXT-Dominated Channels," *IEEE Transactions on Communications*, Vol. 52, No. 7, pp. 1080–1083, July 2004.
- R. Neelamani, H. Choi, and R. G. Baraniuk, "ForWaRD: Fourier-Wavelet Regularized Deconvolution for Ill-Conditioned Systems," *IEEE Transactions on Signal Processing*, Vol. 52, No. 2, pp. 418–433, February 2004.
- G. Henry, R. G. Baraniuk, C. Kely, "The Connexions Project: Promoting Open Sharing Knowledge for Education," *Syllabus*, July 2003.
- R. L. Claypoole, G. Davis, W. Sweldens, and R. G. Baraniuk, "Adaptive Wavelet Transforms for Image Coding using Lifting," *IEEE Transactions on Image Processing*, Vol. 12, No. 12, pp. 1449–1459, December 2003.
- P. Abry, R. G. Baraniuk, P. Flandrin, R. Riedi, D. Veitch, "Multiscale Nature of Network Traffic," *IEEE Signal Processing Magazine*, Vol. 19, No. 3, pp. 28–46, May 2002.
- R. G. Baraniuk, R. A. DeVore, G. Kyriazis, and X. M. Yu, "Near Best Tree Approximation," *Advances in Computational Mathematics*, Vol. 16, pp. 357–373, 2002.
- T. D. Dorney, W. W. Symes, R. G. Baraniuk, D. M. Mittleman, "Terahertz Multistatic Reflection Imaging," *Journal of the Optical Society of America*, Vol. 19, No. 7, July 2002.
- T. D. Dorney, J. L. Johnson, V. J. Rudd, W. W. Symes, R. G. Baraniuk, D. M. Mittleman, "Terahertz Reflection Imaging using Kirkoff Migration," *Optics Letters*, Vol. 26, No. 19, October, 2001.
- H. Choi and R. G. Baraniuk, "Multiscale Texture Segmentation using Wavelet-domain Hidden Markov Models," *IEEE Transactions on Image Processing*, Vol. 10, No. 9, pp. 1309–1321, September 2001.
- J. K. Romberg, H. Choi, and R. G. Baraniuk, "Bayesian Tree-Structured Image Modeling," *IEEE Transactions on Image Processing*, Vol. 10, No. 7, pp. 1056–1068, July 2001.
- R. G. Baraniuk, M. Coates, and T. P. H. Steeghs, "Hybrid Linear/Quadratic Time-Frequency Attributes," *IEEE Transactions on Signal Processing*, Vol. 49, No. 4, pp. 760–755, April 2001.
- R. G. Baraniuk, P. Flandrin, A. J. E. M. Janssen, and O. Michel, "Measuring Information Content and Complexity in Time-Frequency using the Rényi Entropies," *IEEE Transactions on Information Theory*, Vol. 47, No. 4, pp. 1391–1409, 2001.
- R. D. Nowak and R. G. Baraniuk, "Wavelet-Based Transformations for Nonlinear Signal Processing," *IEEE Transactions on Signal Processing*, Vol. 47, No. 7, pp. 1852–1865, July 1999.
- M. Koch, J. V. Rudd, R. Neelamani, M. Gupta, R. G. Baraniuk, and D. M. Mittleman, "Recent Advances in Terahertz Imaging," *Applied Physics B*, Vol. 68, No. 6, pp. 1085–1094, June 1999 (invited paper).
- R. D. Nowak and R. G. Baraniuk, "Wavelet Domain Filtering for Photon Imaging Systems," *IEEE Transactions on Image Processing*, Vol. 8, No. 5, pp. 666–678, May 1999.
- R. H. Riedi, M. S. Crouse, V. J. Ribeiro, and R. G. Baraniuk, "A Multiplicative Wavelet Model with Application to TCP Network Traffic," *IEEE Transactions on Information Theory* (special issue on Multiscale Statistical Signal Analysis and its Applications), Vol. 45, pp. 992–1018, April 1999.
- M. Pasquier, P. Gonçalvès, and R. G. Baraniuk, "Hybrid Linear/Bilinear Time-Scale Analysis," *IEEE Transactions on Signal Processing*, Vol. 47, No. 1, pp. 254–259, January, 1999.

- D. M. Mittleman, R. H. Jacobsen, R. Neelamani, R. G. Baraniuk, and M. C. Nuss, "Gas Sensing using Terahertz Time-Domain Spectroscopy," *Applied Physics B (Lasers and Optics)*, Vol. 67, No. 3, pp. 379–390, 1998 (Invited paper).
- R. G. Baraniuk, "Joint Distributions of Arbitrary Variables Made Easy," *Journal of Multidimensional Systems and Signal Processing* (special issue on Time-Frequency Analysis), Vol. 9, No. 4, pp. 341–348, October 1998.
- R. G. Baraniuk, "Beyond Time-Frequency Analysis: Energy Densities in One and Many Dimensions," *IEEE Transactions on Signal Processing*, Vol. 46, No. 9, pp. 2305–2314, September, 1998.
- R. D. Nowak and R. G. Baraniuk, "Optimal Weighted Highpass Filters using Multiscale Analysis," *IEEE Transactions on Image Processing*, Vol. 7, No. 7, pp. 1068–1074, July 1998.
- P. Gonçalves and R. G. Baraniuk, "Pseudo Affine Wigner Distributions: Definition and Kernel Formulation," *IEEE Transactions on Signal Processing*, Vol. 46, No. 6, pp. 1505–1516, June 1998.
- M. S. Crouse, R. D. Nowak, and R. G. Baraniuk, "Wavelet-based Statistical Signal Processing using Hidden Markov Models," *IEEE Transactions on Signal Processing* (special issue on Theory and Applications of Filter Banks and Wavelet Transforms), Vol. 46, No. 4, pp. 886–902, April 1998 (winner of IEEE Signal Processing Society Young-Author Best Paper Award).
- R. G. Baraniuk and D. L. Jones, "Wigner-Based Formulation of the Chirplet Transform," *IEEE Transactions on Signal Processing*, Vol. 44, No. 12, pp. 3129–3135, December 1996.
- K. A. Farry, I. D. Walker, and R. G. Baraniuk, "Myoelectric Teleoperation of a Complex Robotic Hand," *IEEE Transactions on Robotics and Automation*, Vol. 12, No. 4, pp. 775–788, August 1996.
- P. Gonçalves and R. G. Baraniuk, "A Pseudo-Bertrand Distribution for Time-Scale Analysis," *IEEE Signal Processing Letters*, Vol. 3, No. 3, pp. 82–84, March 1996.
- R. G. Baraniuk, "Covariant Time-Frequency Representations Through Unitary Equivalence," *IEEE Signal Processing Letters*, Vol. 3, No. 3, pp. 79–81, March 1996.
- R. G. Baraniuk, "Limitations of the Kernel Method for Joint Distributions of Arbitrary Variables," *IEEE Signal Processing Letters*, Vol. 3, No. 2, pp. 51–53, February 1996.
- R. G. Baraniuk and D. L. Jones, "Unitary Equivalence: A New Twist on Signal Processing," *IEEE Transactions on Signal Processing*, Vol. 43, No. 10, pp. 2269–2282, October 1995.
- D. L. Jones and R. G. Baraniuk, "An Adaptive Optimal-Kernel Time-Frequency Representation," *IEEE Transactions on Signal Processing*, Vol. 43, No. 10, pp. 2361–2371, October 1995.
- R. G. Baraniuk and L. Cohen, "On Joint Distributions for Arbitrary Variables," *IEEE Signal Processing Letters*, Vol. 2, No. 1, pp. 10–12, January 1995.
- D. L. Jones and R. G. Baraniuk, "A Simple Scheme for Adapting Time-Frequency Representations," *IEEE Transactions on Signal Processing*, Vol. 42, No. 12, pp. 3530–3535, December 1994.
- R. G. Baraniuk and D. L. Jones, "A Signal-Dependent Time-Frequency Representation: Fast Algorithm for Optimal Kernel Design," *IEEE Transactions on Signal Processing*, Vol. 42, No. 1, pp. 134–146, January 1994.
- R. G. Baraniuk and D. L. Jones, "Shear Madness: New Orthonormal Bases and Frames Using Chirp Functions," *IEEE Transactions on Signal Processing* (special issue on Wavelets and Signal Processing), Vol. 41, No. 12, pp. 3543–3549, December 1993.
- R. G. Baraniuk, "A Signal Transform Covariant to Scale Changes," *Electronics Letters*, Vol. 29 No. 19, pp. 1675–1677, September 17, 1993.

- R. G. Baraniuk and D. L. Jones, "Signal-Dependent Time-Frequency Analysis Using a Radially Gaussian Kernel," *Signal Processing*, Vol. 32, No. 3, pp. 263–284, June 1993.
- R. G. Baraniuk and D. L. Jones, "A Signal-Dependent Time-Frequency Representation: Optimal Kernel Design," *IEEE Transactions on Signal Processing*, Vol. 41, No. 4, pp. 1589–1602, April 1993.
- D. L. Jones and R. G. Baraniuk, "Efficient Approximation of Continuous Wavelet Transforms," *IEE Electronics Letters*, Vol. 27, No. 9, pp. 748–750, April 25, 1991.
- B. D. Van Veen and R. G. Baraniuk, "Matrix Based Computation of Floating Point Roundoff Noise," *IEEE Transactions on Acoustics, Speech and Signal Processing*, Vol. 37, No. 12, pp. 1995–1998, December 1989.

CONFERENCE PUBLICATIONS

- Z. Wang, A. Lan, A. Waters, P. Grimaldi, and R. G. Baraniuk, "A Meta-Learning Approach to Automatic Short Answer Grading," *International Conference on Educational Data Mining – EDM*, Montreal, July 2019.
- D. LeJeune, R. Heckel, and R. G. Baraniuk, "Adaptive Estimation for Approximate k -Nearest-Neighbor Computations," *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2019.
- R. Balestrieri and R. G. Baraniuk, "Hard to Soft: Understanding Deep Network Nonlinearities via Vector Quantization and Statistical Inference," *International Conference on Learning Representations (ICLR)*, New Orleans, May 2019.
- A. Mousavi, G. Dasarathy, and R. G. Baraniuk, "A Data-Driven and Distributed Approach to Sparse Signal Representation and Recovery," *International Conference on Learning Representations (ICLR)*, New Orleans, May 2019.
- Z. Wang, R. Balestrieri, and R. G. Baraniuk, "A Max-Affine Perspective of Recurrent Neural Networks," *International Conference on Learning Representations (ICLR)*, New Orleans, May 2019.
- J. J. Michalenko, A. Shah, A. Verma, R. G. Baraniuk, S. Chaudhuri, and A. B. Patel, "Representing Formal Languages: A Comparison between Finite Automata and Recurrent Neural Networks," *International Conference on Learning Representations (ICLR)*, New Orleans, May 2019.
- T. Nguyen and R. G. Baraniuk, "Neural Rendering Model," *Neural Information Processing Systems (NIPS) Workshop on Integrating Theories of Deep Learning*, Montreal, December 2018.
- R. Balestrieri and R. G. Baraniuk, "A Max-Affine Spline View of Deep Network Nonlinearities," *Neural Information Processing Systems (NIPS) Workshop on Integrating Theories of Deep Learning*, Montreal, December 2018.
- W. Yue, T. Nguyen, Z. Wang, R. G. Baraniuk, and Y. Lin, "EnergyNet: Energy-Efficient Dynamic Inference," *Neural Information Processing Systems (NIPS) Workshop on Compact Deep Neural Networks with Industrial Applications*, Montreal, December 2018.
- N. Dunkelberger, J. Bradley, J. Sullivan, N. P. Walling, I. Manickam, G. Dasarathy, A. Israr, F. W. Y. Lau, K. Klumb, B. Knott, F. Abnoui, R. G. Baraniuk, M. K. O'Malley, "Conveying Language through Haptics: A Multi-sensory Approach," *International Symposium on Wearable Computers (ISWC)*, Singapore, October 2018.
- R. Balestrieri and R. G. Baraniuk, "A Spline Theory of Deep Learning," *International Conference on Machine Learning (ICML)*, Stockholm, Sweden, July 2018.

- A. Aghazadeh, R. Spring, D. LeJeune, G. Dasarathy, A. Srivastava, and R. G. Baraniuk, “Ultra-Large Scale Feature Selection using Count-Sketches,” *International Conference on Machine Learning (ICML)*, Stockholm, Sweden, July 2018.
- C. A. Metzler, P. Schniter, A. Veeraraghavan, and R. G. Baraniuk, “prDeep: Robust Phase Retrieval with Flexible Deep Neural Networks,” *International Conference on Machine Learning (ICML)*, Stockholm, Sweden, July 2018.
- C. Romain, R. Balestrieri, H. Glotin, and R. G. Baraniuk, “Spline Filters for End-to-End Deep Learning,” *International Conference on Machine Learning (ICML)*, Stockholm, Sweden, July 2018.
- C. Metzler, P. Schniter, and R. G. Baraniuk., “An Expectation-Maximization Approach to Tuning Generalized Vector Approximate Message Passing,” *International Conference on Latent Variable Analysis and Signal Separation (LVA/ICA)*, special session on Advances in Phase Retrieval and Applications, July 2018.
- Z. Wang, A. Lan, W. Nie, P. Grimaldi, R. Schloss, and R. G. Baraniuk, “QG-Net: A Data-Driven Question Generation Model for Educational Content,” *ACM Conference on Learning at Scale – L@S*, London, UK, June 2018.
- A. Aghazadeh, M. Golbabaee, A. Lan, and R. G. Baraniuk, “Insense: Incoherent Sensor Selection for Sparse Signals,” *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP’18*, Calgary, April 2018.
- C. Metzler, A. Mousavi, and R. G. Baraniuk, “Learned D-AMP: Principled Neural-network-based Compressive Image Recovery,” *Neural Information Processing Systems (NIPS)*, Long Beach, CA, December 2017.
- A. Mousavi, G. Dasarathy, and R. G. Baraniuk, “DeepCodec: Adaptive Sensing and Recovery via Deep Convolutional Neural Networks,” *Allerton Conference on Communication, Control, and Computing* (invited paper), Allerton, IL, October 2017.
- G. Dasarathy, P. Shah, and R. G. Baraniuk, “Sketched Covariance Testing: A Compression-Statistics Trade-off,” *51st Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, October 2017.
- T. Nguyen, W. Liu, F. Sinz, R. G. Baraniuk, A. S. Tolia, X. Pitkow, A. B. Patel, “Towards a Cortically Inspired Deep Learning Model: Semi-Supervised Learning, Divisive Normalization, and Synaptic Pruning,” *Conference on Cognitive Computational Neuroscience*, New York City, September 2017.
- A. Aghazadeh, A. Lan, A. Shrivastava, and R. G. Baraniuk, “RHash: Robust Hashing via ℓ_∞ -norm Distortion,” *International Joint Conference on Artificial Intelligence – IJCAI*, Melbourne, Australia, August 2017.
- G. Dasarathy, P. Shah, and R. G. Baraniuk, “Sketched Covariance Testing: A Compression-Statistics Trade-off,” *IEEE International Symposium on Information Theory – ISIT*, Aachen, Germany, June 2017.
- J. Michalenko, A. S. Lan, and R. G. Baraniuk, “Data-mining Textual Responses to Uncover Misconception Patterns,” *International Conference on Educational Data Mining – EDM*, Wuhan, China, June 2017.
- Z. Wang, A. S. Lan, and R. G. Baraniuk, “A Latent Factor Model For Instructor Content Preference Analysis,” *International Conference on Educational Data Mining – EDM*, Wuhan, China, June 2017.
- A. E. Waters, P. Grimaldi, A. S. Lan, and R. G. Baraniuk, “Short-Answer Responses to STEM Exercises: Measuring Response Validity and Its Impact,” *International Conference on Educational Data Mining – EDM*, Wuhan, China, June 2017.

- J. Michalenko, A. S. Lan, and R. G. Baraniuk, "Personalized Feedback for Open-Response Mathematical Questions using Long Short-Term Memory Networks," *International Conference on Educational Data Mining – EDM*, Wuhan, China, June 2017.
- J. Michalenko, A. S. Lan, and R. G. Baraniuk, "Data-mining Textual Responses to Uncover Misconception Patterns," *ACM Conference on Learning at Scale – L@S*, Work in Progress session, Boston, April 2017.
- A. Mousavi and R. G. Baraniuk, "Learning to Invert: Signal Recovery via Deep Convolutional Networks," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'17*, New Orleans, March 2017.
- J. Tan, R. G. Baraniuk, V. Boominathan, and A. Veeraraghavan, "Flat Focus: Depth of Field Analysis for the Flatcam Lensless Imaging System," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'17*, special session in honor of John Cozzens, New Orleans, March 2017.
- I. Manickam, A. Lan, and R. G. Baraniuk, "Contextual Multi-Armed Bandit Algorithms for Personalized Learning Action Selection," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'17*, special session on Advances in Signal Processing Education, New Orleans, March 2017.
- A. Patel, T. Nguyen, and R. G. Baraniuk, "A Probabilistic Framework for Deep Learning," *Neural Information Processing Systems (NIPS)*, Barcelona, December 2016.
- A. Lan, D. Vats, C. Studer, and R. G. Baraniuk, "Optimal Ranking of Test Items using the Rasch Model," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2016.
- C. Metzler, A. Maleki, and R. G. Baraniuk, "BM3D-PRGAMP: Compressive Phase Retrieval based on BM3D Denoising," *IEEE International Conference on Image Processing (ICIP)*, Phoenix, September 2016.
- A. Lan, C. Studer, T. Goldstein, and R. G. Baraniuk, "Dealbreaker: A Nonlinear Latent Variable Model for Educational Data," *International Conference on Machine Learning (ICML)*, New York, June 2016.
- A. Waters, P. Grimaldi, A. Lan, and R. G. Baraniuk, "Short-Answer Responses to STEM Questions: Measuring Response Validity and Its Impact on Learning," *International Conference on Educational Data Mining*, Raleigh, NC, June 2016.
- A. Lan and R. G. Baraniuk, "A Contextual Bandits Framework for Personalized Learning Action Selection," *International Conference on Educational Data Mining*, Raleigh, NC, June 2016.
- A. Patel, T. Nguyen, and R. G. Baraniuk, "A Probabilistic Theory of Deep Learning," *Computational and Systems Neuroscience (COSYNE)*, Salt Lake City, February 2016.
- S. Wood, C. Metzler, E. Fontenla, W. Chiu, and R. G. Baraniuk, "Iterative Reconstruction from Limited Angle, Limited View Projections for Cryo-Electron Tomography," *49rd Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 2015.
- C. Metzler, A. Maleki, R. G. Baraniuk, "Connecting Bayesian and Denoising-Based Approximate Message Passing" *49rd Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 2015.
- A. Mousavi and R. G. Baraniuk, "An Information-Theoretic Measure of Dependency Among Variables in Large Datasets," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2015.
- A. Mousavi, A. Patel, and R. G. Baraniuk, "A Deep Learning Approach to Structured Signal Recovery," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2015.

- C. Metzler, A. Maleki, and R. G. Baraniuk, “BM3D-AMP: A new image recovery algorithm based on BM3D denoising,” *IEEE International Conference on Image Processing (ICIP)*, September 2015. (ICIP “Top 10%” paper)
- S. Wood, C. Metzler, E. Fontenla, W. Chiu, and R. G. Baraniuk, “Dynamic Model Generation for Application of Compressed Sensing to CRYO-Electron Tomography Reconstruction,” *IEEE Signal Processing and Signal Processing Education Workshop*, Snowbird, UT, August 2015.
- E. L. Dyer, T. A. Goldstein, R. Patel, K. P. Körding, and R. G. Baraniuk, “Sparse Self-Expressive Decompositions for Dimensionality Reduction and Clustering,” *Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Cambridge, UK, July 2015.
- S. Asif and R. G. Baraniuk, “Calibration-Free Accelerated Dynamic MRI based on Low-Rank Matrix Recovery,” *Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Cambridge, UK, July 2015.
- T. Goldstein, C. Studer, and R. G. Baraniuk, “Forward-Backward Splitting Made FASTA,” *Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Cambridge, UK, July 2015.
- T. Goldstein, C. Studer, and R. G. Baraniuk, “Efficient Algorithms for ℓ_∞ -Norm Minimization,” *Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Cambridge, UK, July 2015.
- C. Metzler, A. Maleki, and R. G. Baraniuk, “Optimal Recovery from Compressive Measurements via Denoising-based Approximate Message Passing,” *Sampling Theory and Applications (SampTA)*, Washington, D.C., May 2015.
- A. Waters, D. Tinapple, and R. G. Baraniuk, “A Bayesian Approach to Ranked Peer Grading,” *ACM Conference on Learning at Scale (L@S)*, Vancouver, March 2015.
- A. Lan, D. Vats, A. Waters, and R. G. Baraniuk, “Mathematical Language Processing: Automatic Grading and Feedback for Open Response Mathematical Questions,” *ACM Conference on Learning at Scale (L@S)*, Vancouver, March 2015.
- A. Mousavi, A. Maleki, and R. G. Baraniuk, “Optimal Tuning of Approximate Message Passing,” *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2014.
- A. Lan, C. Studer, and R. G. Baraniuk, “Time-Varying Learning and Content Analytics via Sparse Factor Analysis,” *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, New York, August 2014.
- A. Lan, C. Studer, and R. G. Baraniuk, “Quantized Matrix Completion for Personalized Learning,” *International Conference on Educational Data Mining (EDM)*, London, July 2014.
- D. Vats, C. Studer, and R. G. Baraniuk, “Item Selection in Massive Open Online Courses,” *International Meeting of the Psychometric Society (IMPS)*, July 2014.
- A. Lan, C. Studer, and R. G. Baraniuk, “Matrix Recovery From Quantized and Corrupted Measurements,” *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP’14*, Florence, May 2014.
- C. Hegde, A. Sankaranarayanan, and R. G. Baraniuk, “Lie Operators for Compressive Sensing,” *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP’14*, Florence, May 2014.
- D. Vats and R. G. Baraniuk, “Path Thresholding: Asymptotically Tuning-Free High-Dimensional Sparse Regression,” *International Conference on Artificial Intelligence and Statistics (AISTATS)*, Reykjavik, Iceland, 2014.

- D. Vats, R. D. Nowak, and R. G. Baraniuk, "Active Learning for Undirected Graphical Model Selection," *17th International Conference on Artificial Intelligence and Statistics (AISTATS)*, Reykjavik, Iceland, 2014.
- T. Goldstein, E. Esser, and R. G. Baraniuk, "Adaptive Primal Dual Optimization for Image Processing and Learning," *Neural Information Processing Systems (NIPS)*, Optimization for Machine Learning Workshop, Lake Tahoe, December 2013.
- D. Vats and R. G. Baraniuk, "When in Doubt, SWAP: High-Dimensional Sparse Recovery from Correlated Measurements," *Neural Information Processing Systems (NIPS)*, Lake Tahoe, December 2013.
- A. Waters, C. Studer, R. G. Baraniuk, "Bayesian Pairwise Collaboration Detection in Educational Datasets," *IEEE GlobalSIP Symposium on New Sensing and Statistical Inference Methods*, Austin, December 2013.
- W. L. Chan, R. G. Baraniuk, D. Mittleman, H. T. Chen, A. Taylor, I. Brener, M. Cich, "Terahertz Imaging using Compressive Sensing," *IEEE GlobalSIP Symposium on Millimeter Wave Imaging and Communications*, Austin, December 2013.
- E. Dyer, C. Studer, J. Robinson, and R. G. Baraniuk, "A Robust and Efficient Method to Recover Neural Events from Noisy and Corrupted Data," *IEEE EMBS Conference on Neural Engineering*, San Diego, November 2013.
- L. Anitori, A. Maleki, M. Otten, R. G. Baraniuk, and P. Hoogeboom, "Compressive Sensing Radar: Simulation and Experiments for Target Detection," *European Signal Processing Conference (EUSIPCO)*, Marrakech, Morocco, September 2013.
- C. Studer, G. Pope, P. Navarro, and R. G. Baraniuk, "Recovering Sparse Low-Rank Blocks in Tandem Mass Spectrometry," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2013.
- C. Hegde, A. C. Sankaranarayanan, and R. G. Baraniuk, "Learning Measurement Matrices for Redundant Dictionaries," *Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Lausanne, Switzerland, July 2013.
- D. Vats, C. Studer, A. Lan, L. Carin, and R. G. Baraniuk, "Test-size Reduction for Concept Estimation," *International Conference on Educational Data Mining (EDM)*, Memphis, July 2013.
- Y. Li, C. Hedge, R. G. Baraniuk, and K. F. Kelly, "Compressive Classification via Secant Projections," *Imaging and Applied Optics Congress*, Arlington, VA, June 2013.
- A. Aghazadeh, A. Ayremlou, D. Calderon, T. Goldstein, R. Patel, D. Vats, and R. G. Baraniuk, "Adaptive Step Size Selection for Optimization via the Ski Rental Problem," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'13*, Vancouver, May 2013.
- E. Dyer, C. Studer, and R. G. Baraniuk, "Subspace Clustering with Dense Representations," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'13*, Vancouver, May 2013.
- J. P. Slavinsky, K. J. Davenport, A. C. Butler, E. J. Marsh, and R. G. Baraniuk, "Open Online Platforms Advancing DSP Education," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'13*, Vancouver, May 2013.
- A. E. Waters, A. S. Lan, C. Studer, and R. G. Baraniuk "Learning Analytics Via Sparse Factor Analysis," *Neural Information Processing Systems Workshop on Personalizing Education With Machine Learning*, Lake Tahoe, NV, December 2012.
- A. S. Lan, A. E. Waters, C. Studer, and R. G. Baraniuk, "Joint Sparse Factor Analysis and Topic Modeling for Learning Analytics," *Neural Information Processing Systems Workshop on Personalizing Education With Machine Learning*, Lake Tahoe, NV, December 2012.

- D. K. Grady, M. Moll, C. Hegde, A. C. Sankaranarayanan, and R. G. Baraniuk, and L. E. Kavraki, "Multi-Objective Sensor-Based Replanning for a Car-Like Robot," *IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR 2012)*, College Station, TX, November 2012.
- D. K. Grady, M. Moll, C. Hegde, A. C. Sankaranarayanan, R. G. Baraniuk, and L. E. Kavraki, "Multi-Robot Target Verification With Reachability Constraints," *IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR 2012)*, College Station, TX, November 2012.
- C. Studer, W. Yin, and R. G. Baraniuk, "Signal Representations with Minimum ℓ_∞ Norm," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2012.
- C. Hegde, A. Sankaranarayanan, and R. G. Baraniuk, "Near Isometric Linear Embeddings of Manifolds" *IEEE Statistical Signal Processing Workshop*, Ann Arbor, August 2012.
- J. Haupt, R. Castro, R. D. Nowak, and R. G. Baraniuk, "Sequentially Designed Compressed Sensing" *IEEE Statistical Signal Processing Workshop*, Ann Arbor, August 2012.
- E. Dyer, R. G. Baraniuk, and U. Rutishauser, "Group Sparse Coding with a Collection of Winner-Take-All Networks," *Computational Neuroscience Symposium – CNS*, Atlanta, July 2012.
- J. Shi, A. Sankaranarayanan, C. Studer, R. G. Baraniuk, "Video Compressive Sensing for Dynamic MRI," *Computational Neuroscience Symposium – CNS*, Atlanta, July 2012.
- C. Hegde and R. G. Baraniuk, "SPIN: Iterative Signal Recovery on Incoherent Manifolds," *IEEE International Symposium on Information Theory – ISIT*, Boston, July 2012.
- S. Jalali, A. Maleki, and R. G. Baraniuk. "Minimum Complexity Pursuit: Stability Analysis," *IEEE International Symposium on Information Theory – ISIT*, Boston, July 2012.
- L. Anitori, A. Maleki, M. Otten, P. Hoogeboom, and R. G. Baraniuk, "Compressive CFAR Radar Detection," *IEEE Radar Conference*, Atlanta, May 2012 (Runner Up, Best Student Paper Prize).
- L. Anitori, A. Maleki, M. Otten, R. G. Baraniuk, and P. Hoogeboom, "Compressive CFAR Radar Detectors," *International Workshop on Compressed Sensing applied to Radar*, Bonn, Germany, May 2012.
- T. A. Russell, L. McMackin, R. Bridge, R. G. Baraniuk, "Compressive Hyperspectral Sensor for LWIR Gas Detection," *SPIE Conference on Defense, Security, and Sensing*, Baltimore, April 2012.
- A. E. Waters, A. Lan, C. Studer, and R. G. Baraniuk, "Sparse Factor Analysis for Cognitive Tutoring," *Learning Workshop*, Snowbird, UT, April 2012.
- L. Anitori, A. Maleki, M. Otten, P. Hoogeboom, and R. G. Baraniuk, "CS Radar Imaging via Adaptive CAMP," *9th European Conference on Synthetic Aperture Radar*, Nuremberg, Germany, April 2012.
- A. Sankaranarayanan, C. Studer, and R. G. Baraniuk, "CS-MUVI: Video Compressive Sensing for Spatial-Multiplexing Cameras," *IEEE International Conference on Computational Photography (ICCP)*, Seattle, April 2012.
- S. R. Schnelle, J. P. Slavinsky, P. Boufounos, M. A. Davenport, and R. G. Baraniuk, "A Compressive Phase Locked Loop," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'12*, Kyoto, Japan, March 2012.
- A. Waters, C. Sestok, and R. G. Baraniuk, "A Bit-Constrained SAR ADC for Compressive Acquisition of Frequency Sparse Signals," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'12*, special session on Analog Signal Processing, Kyoto, Japan, March 2012.
- C. Studer and R. G. Baraniuk, "Dictionary Learning from Sparsely Corrupted of Compressed Signals" *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'12*, Kyoto, Japan, March 2012.

- A. Waters, and R. G. Baraniuk, "SpaRCS: Recovering Low-Rank and Sparse Matrices from Compressive Measurements," *Neural Information Processing Systems (NIPS)*, Granada, Spain, December 2011.
- J. N. Laska, J. P. Slavinsky, and R. G. Baraniuk, "The Polyphase Random Demodulator for Wideband Compressive Sensing," *45th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 2011.
- A. Maleki, M. Narayan, and R. G. Baraniuk, "Suboptimality of Nonlocal Means on Images with Sharp Edges," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2011.
- A. C. Sankaranarayanan, C. Hegde, S. Narayan, and R. G. Baraniuk, "Go with the Flow: Optical Flow-based Transport Operators for Image Manifolds," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2011.
- C. Studer and R. G. Baraniuk, "Recovery Guarantees for Restoration and Separation of Approximately Sparse Signals," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2011.
- A. Maleki and R. G. Baraniuk, "Least Favorable Compressed Sensing Problems for First Order Methods," *IEEE International Symposium on Information Theory (ISIT)*, St. Petersburg, Russia, August, 2011.
- M. F. Duarte and R. G. Baraniuk, "Compressive Sensing with Biorthogonal Wavelets via Structured Sparsity," *SPARS*, Edinburgh, July 2011.
- E. Dyer, A. Sankaranarayanan, and R. G. Baraniuk, "Learning hybrid linear models via sparse recovery," *SPARS*, Edinburgh, July 2011.
- J. R. Treichler, M. F. Davenport, J. N. Laska, and R. G. Baraniuk, "Dynamic Range and Compressive Sensing Signal Acquisition Receivers," *Defense Applications of Signal Processing (DASP)*, Coolool, Australia, July 2011.
- J. P. Slavinsky, J. Laska, and R. G. Baraniuk, "The Compressive Multiplexer for Multi-Channel Compressive Sensing," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'11*, Prague, May 2011.
- J. Haupt and R. G. Baraniuk, "Robust Support Recovery Using Sparse Compressive Sensing Matrices," *Conference on Information Sciences and Systems (CISS)*, Johns Hopkins University, March 2011.
- M. A. Davenport, C. Hegde, M. A. Duarte, and R. G. Baraniuk, "High-Dimensional Data Fusion via Joint Manifold Learning," *AAAI Symposium on Manifold Learning*, Arlington, VA, 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," *Military Communications Conference (MILCOM)*, November 2010.
- M. F. Duarte and R. G. Baraniuk, "Recovery of Frequency-Sparse Signals from Compressive Measurements," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2010.
- A. C. Sankaranarayanan, P. K. Turaga, R. G. Baraniuk, and R. Chellappa, "Compressive Acquisition of Dynamic Scenes," *European Conference on Computer Vision (ECCV)*, Crete, Greece, September 2010.
- E. Dyer, M. F. Duarte, D. H. Johnson, and R. G. Baraniuk, "Recovering Spikes from Noisy Neuronal Calcium Signals via Structured Sparse Approximation," *9th International Conference on Latent Variable Analysis and Signal Separation (LVA/ICA)*, St. Malo, France, September 2010.

- M. F. Duarte and R. G. Baraniuk, "Kronecker Product Matrices for Compressive Sensing," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'10*, Dallas, March 2010.
- C. Hedge and R. G. Baraniuk, "Compressive Sensing of a Superposition of Pulses," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'10*, Dallas, March 2010.
- S. Schnelle, J. Laska, C. Hegde, M. F. Duarte, M. Davenport, and R. G. Baraniuk, "Texas Hold 'Em Algorithms for Distributed Compressive Sensing," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'10*, Dallas, March 2010.
- E. Dyer, D. H. Johnson, and R. G. Baraniuk, "Sparse Coding in Modular Networks," *Computational and Systems Neuroscience (COSYNE)*, Salt Lake City, February 2010.
- J. D. Haupt, R. G. Baraniuk, R. M. Castro, and R. D. Nowak, "Compressive Distilled Sensing: Sparse Recovery Using Adaptivity in Compressive Measurements," *43rd Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, October 2009.
- J. Laska, M. Davenport, and R. G. Baraniuk, "Exact Signal Recovery from Sparsely Corrupted Measurements through the Pursuit of Justice," *43rd Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, October 2009.
- J. R. Treichler, M. A. Davenport, and R. G. Baraniuk, "Application of Compressive Sensing to the Design of Wideband Signal Acquisition Receivers," *Defense Applications of Signal Processing (DASP)*, Lihue, Hawaii, September 2009.
- M. Davenport and R. G. Baraniuk, "Sparse Geodesic Paths," *AAAI Symposium on Manifold Learning*, Arlington, VA, November 2009.
- E. Dyer, D. H. Johnson, and R. G. Baraniuk, "Sparse Coding with Population Sketches," *Computational Neuroscience (CNS)*, Berlin, July 2009.
- V. Cevher, P. Indyk, C. Hegde, and R. G. Baraniuk, "Compressive Sensing Recovery of Signals with Clustered Sparsity," *Conference on Sampling Theory and Applications (SAMPTA)*, Marseille, May 2009.
- J. Laska, P. Boufounos, and R. G. Baraniuk, "Finite Range Scalar Quantization for Compressive Sensing," *Conference on Sampling Theory and Applications (SAMPTA)*, Marseille, May 2009.
- M. F. Duarte, C. Hegde, V. Cevher, and R. G. Baraniuk, "Recovery of Compressible Signals in Unions of Subspaces," *Conference on Information Sciences and Systems (CISS)*, Johns Hopkins University, March 2009.
- M. Davenport, P. Boufounos, and R. G. Baraniuk, "Compressive Domain Interference Cancellation," *SPARS Workshop*, Saint-Malo, France, April 2009.
- V. Cevher, P. Boufounos, R. G. Baraniuk, A. Gilbert, and M. Strauss, "Near-Optimal Bayesian Localization via Incoherence and Sparsity," *International Symposium on Integrated Processing in Sensor Networks (IPSN)*, San Francisco, April 2009.
- V. Cevher, C. Hegde, M. F. Duarte, and R. G. Baraniuk, "Sparse Signal Recovery Using Markov Random Fields," *Neural Information Processing Systems (NIPS)*, Vancouver, December 2008.
- V. Cevher, P. Boufounos, M. F. Duarte, and R. G. Baraniuk, "Space Cutting for Distributed Localization," *42nd Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, October, 2008.
- T. Ragheb, J. N. Laska, R. G. Baraniuk, and Y. Massoud, "Implementation of a Random Demodulation Based Compressive Analog-to-Digital Converter," *IEEE Midwest Symposium on Circuits and Systems*, Knoxville, August 2008.
- V. Cevher and R. G. Baraniuk, "Compressive Sensing for Sensor Calibration," *Fifth IEEE Workshop on Sensor Array and Multi-Channel Signal Processing (SAM)*, Darmstadt, Germany, July 2008.

- V. Cevher, M. F. Duarte, and R. G. Baraniuk, "Distributed Target Localization via Spatial Sparsity," *16th European Signal Processing Conference — EUSIPCO*, Lausanne, August 2008.
- P. Boufounos and R. G. Baraniuk, "Reconstructing Sparse Signals from their Zero Crossings," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'08*, Las Vegas, May 2008.
- M. F. Duarte, M. B. Wakin, and R. G. Baraniuk, "Wavelet-domain Compressive Signal Reconstruction using a Hidden Markov Tree Model," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'08*, Las Vegas, May 2008.
- S. Pfetsch, T. Ragheb, J. N. Laska, H. Nejati, A. Gilbert, M. Strauss, R. G. Baraniuk, and Y. Massoud, "A Hardware Prototype for Random-Sampling Based Sub-Nyquist Analog-to-Information Conversion," *IEEE International Symposium on Circuits and Systems (ISCAS)*, Seattle, May 2008.
- W. L. Chan, K. Charan, D. Takhar, K. F. Kelly, R. G. Baraniuk, and D. M. Mittleman, "A Single-Pixel Terahertz Camera," *Conference on Lasers and Electro-Optics (CLEO)*, San Jose, May 2008.
- P. Boufounos and R. G. Baraniuk, "One-Bit Compressive Sensing," *Conference on Information Sciences and Systems (CISS)*, Princeton, March 2008.
- M. A. Sheikh, O. Milenkovic, and R. G. Baraniuk, "Designing Compressive Sensing DNA Microarrays," *Second International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, St. Thomas, Virgin Islands, December 2007.
- C. Hegde, M. Davenport, M. Wakin, and R. G. Baraniuk, "Efficient Machine Learning using Random Projections," *Neural Information Processing Systems (NIPS) Workshop on Efficient Machine Learning*, Whistler, December 2007.
- M. Davenport, C. Hegde, M. Wakin, and R. G. Baraniuk, "Manifold-based Approaches for Improved Classification," *Neural Information Processing Systems (NIPS) Workshop on Topology Learning*, Whistler, December 2007.
- C. Hegde, M. Wakin, and R. G. Baraniuk, "Random Projections for Manifold Learning," *Neural Information Processing Systems (NIPS)*, Vancouver, December 2007.
- C. J. Rozell, D. H. Johnson, R. G. Baraniuk, B. A. Olshausen, "Locally Competitive Algorithms for Sparse Approximation," *IEEE International Conference on Image Processing (ICIP)*, San Antonio, TX, September 2007.
- M. F. Duarte, M. Davenport, M. Wakin, J. Laska, D. Takhar, K. F. Kelly, R. G. Baraniuk, "Multiscale Random Projections for Compressive Classification," *IEEE International Conference on Image Processing (ICIP)*, San Antonio, TX, September 2007.
- M. Sheikh, R. G. Baraniuk, "Blind Error-free Detection of Transform-Domain Watermarks," *IEEE International Conference on Image Processing (ICIP)*, San Antonio, TX, September 2007.
- P. T. Boufounos, M. F. Duarte, and R. G. Baraniuk, "Sparse Signal Reconstruction from Noisy Compressive Measurements Using Cross Validation," *IEEE Statistical Signal Processing Workshop*, Madison, WI, August, 2007.
- M. Davenport, R. G. Baraniuk, and C. Scott, "Minimax support vector machines," *IEEE Statistical Signal Processing Workshop*, Madison, WI, August, 2007.
- M. A. Sheikh, S. Sarvotham, O. Milenkovic, and R. G. Baraniuk, "DNA Array Decoding From Nonlinear Measurements By Belief Propagation," *IEEE Statistical Signal Processing Workshop*, Madison, WI, August, 2007.

- M. Moravec, J. K. Romberg, R. G. Baraniuk, "Compressive Phase Retrieval," *Wavelets XII in SPIE International Symposium on Optical Science and Technology*, San Diego, August 2007.
- P. Boufounos, R. G. Baraniuk, "Sigma Delta Quantization for Compressive Sensing," *Wavelets XII in SPIE International Symposium on Optical Science and Technology*, San Diego, August 2007.
- T. Ragheb, S. Kirolos, J. Laska, A. Gilbert, M. Strauss, R. G. Baraniuk, Y. Massoud, "Implementation Models for Analog-to-Information Conversion via Random Sampling," *IEEE International Midwest Symposium on Circuits and Systems*, Montreal, August 2007.
- J. N. Laska, S. Kirolos, M. F. Duarte, T. Ragheb, R. G. Baraniuk, Y. Massoud, "Theory and Implementation of an Analog-to-Information Converter using Random Demodulation," *IEEE International Symposium on Circuits and Systems (ISCAS)*, New Orleans, May 2007.
- W. L. Chan, M. L. Moravec, R. G. Baraniuk, and D. M. Mittleman, "Terahertz Imaging with Compressed Sensing and Phase Retrieval," *Conference on Lasers and Electro-Optics (CLEO)*, San Jose, May 2007.
- R. G. Baraniuk and T. P. H. Steeghs, "Compressive Radar Imaging," *IEEE Radar Conference*, Waltham, MA, April 2007.
- C. J. Rozell, D. H. Johnson, R. G. Baraniuk, B. A. Olshausen, "Neurally Plausible Sparse Coding via Competitive Algorithms," *Computational and Systems Neuroscience (COSYNE)*, Salt Lake City, February 2007.
- M. A. Davenport, M. F. Duarte, M. B. Wakin, J. A. Laska, D. Takhar, K. F. Kelly, R. G. Baraniuk, "The Smashed Filter for Compressive Classification and Target Recognition," *IS&T/SPIE Computational Imaging IV*, San Jose, January 2007.
- M. Davenport, R. G. Baraniuk, and M. B. Wakin, "Scalable Inference and Recovery from Compressive Measurements," *Neural Information Processing Systems (NIPS) Workshop on Novel Applications of Dimensionality Reduction*, Whistler, December 2006.
- S. Kirolos, T. Ragheb, J. Laska, M. F. Duarte, Y. Massoud, R. G. Baraniuk, "Practical Issues in Implementing Analog-to-Information Converters," *IEEE International Workshop on System-on-Chip for Real-Time Applications (IWSOC)*, December 2006.
- J. Laska, S. Kirolos, Y. Massoud, R. G. Baraniuk, A. Gilbert, M. Iwen, M. Strauss, "Random Sampling for Analog-to-Information Conversion of Wideband Signals," *IEEE Dallas Circuits and Systems Workshop*, October 2006.
- S. Kirolos, J. Laska, M. Wakin, M. F. Duarte, D. Baron, T. Ragheb, Y. Massoud, R. G. Baraniuk, "Analog-to-Information Conversion via Random Demodulation," *IEEE Dallas Circuits and Systems Workshop*, October 2006.
- W. Chan, H. Choi, R. G. Baraniuk, "Multiscale Disparity Estimation using the Quaternion Wavelet Transform," *IEEE International Conference on Image Processing (ICIP)*, Atlanta, October 2006.
- M. B. Wakin, J. Laska, M. F. Duarte, D. Baron, S. Sarvotham, D. Takhar, K. Kelly, R. G. Baraniuk, "A New Camera Architecture for Compressive Imaging," *IEEE International Conference on Image Processing (ICIP)*, Atlanta, October 2006.
- S. Sarvotham, D. Baron, R. G. Baraniuk, "Measurements and Bits: Compressed Sensing Meets Information Theory," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2006.
- R. Von Borries, C. S. Burrus, R. G. Baraniuk, "DSpanish: Open Educational Resources for Engineering in Spanish," *IEEE Digital Signal Processing Workshop*, Jackson Lake Lodge, September 2006.

- M. A. Davenport, R. G. Baraniuk, C. Scott, "Learning Minimum Volume Sets with Support Vector Machines," *IEEE International Workshop on Machine Learning for Signal Processing*, Maynooth, Ireland, September 2006.
- S. Sarvotham, D. Baron, R. G. Baraniuk, "Sudocodes – Fast Measurement and Reconstruction of Sparse Signals," *IEEE International Symposium on Information Theory – ISIT*, Seattle, July 2006.
- M. Wakin and R. G. Baraniuk, "Random Projections of Signal Manifolds," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'06*, Special session on Statistical Inference on Nonlinear Manifolds, Toulouse, France, May 2006.
- M. F. Duarte, M. Davenport, M. B. Wakin, and R. G. Baraniuk, "Sparse Signal Detection from Incoherent Projections," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'06*, Toulouse, France, May 2006.
- J. Tropp, M. B. Wakin, M. F. Duarte, D. Baron, and R. G. Baraniuk, "Random Filters for Compressive Sampling and Reconstruction," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'06*, Toulouse, France, May 2006.
- M. Davenport, C. Scott, and R. G. Baraniuk, "Controlling False Alarms with Support Vector Machines," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'06*, Toulouse, France, May 2006.
- M. Wakin, J. N. Laska, M. F. Duarte, D. Baron, S. Sarvotham, D. Takhar, K. F. Kelly, R. G. Baraniuk, "Compressive Imaging for Video Representation and Coding," *Picture Coding Symposium*, special session on Next Generation Video Representation, Beijing, April 2006.
- M. F. Duarte, M. Wakin, D. Baron, and R. G. Baraniuk, "Universal Distributed Sensing via Random Projections," *International Symposium on Integrated Processing in Sensor Networks (IPSN)*, Nashville, April 2006.
- R. Wagner, R. G. Baraniuk, Shu Du, D. B. Johnson, A. Cohen, "An Architecture for Wavelet Analysis and Processing in Sensor Networks," *International Symposium on Integrated Processing in Sensor Networks (IPSN)*, Nashville, April 2006.
- D. Baron, S. Sarvotham, R. G. Baraniuk, "Coding vs. Packet Retransmission in Lossy Communication Systems," *Conference on Information Sciences and Systems (CISS)*, Baltimore, March 2006.
- D. Takhar, J. N. Laska, M. B. Wakin, M. F. Duarte, D. Baron, S. Sarvotham, K. F. Kelly, R. G. Baraniuk, "A New Compressive Imaging Camera Architecture using Optical-Domain Compression," *IS&T/SPIE Computational Imaging IV*, San Jose, January 2006.
- M. F. Duarte, M. Wakin, S. Sarvotham, D. Baron, and R. G. Baraniuk "Recovery of Jointly Sparse Signals from Few Random Projections," *Neural Information Processing Systems (NIPS)*, Vancouver, December 2005.
- M. F. Duarte, M. Wakin, S. Sarvotham, D. Baron, and R. G. Baraniuk, "Distributed Compressed Sensing of Jointly Sparse Signals," *39th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2005.
- S. Sarvotham, D. Baron, and R. G. Baraniuk, "Variable-Rate Universal Slepian-Wolf Coding with Feedback," *39th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2005.
- D. Baron, M. F. Duarte, S. Sarvotham, M. Wakin, and R.G. Baraniuk, "An Information-Theoretic Approach to Distributed Compressed Sensing," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2005.

- S. Sarvotham, D. Baron, and R.G. Baraniuk, "Variable-Rate Coding with Feedback for Universal Communication Systems," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2005.
- M. Wakin, D. L. Donoho, H. Choi, and R. G. Baraniuk, "The Multiscale Structure of Non-Differentiable Image Manifolds," *Wavelets XI in SPIE International Symposium on Optical Science and Technology*, San Diego, August 2005.
- W. Chan, H. Choi, and R. G. Baraniuk, "Coherent Image Processing using Quaternion Wavelets," *Wavelets XI in SPIE International Symposium on Optical Science and Technology*, San Diego, August 2005.
- R. Wagner, V. Delouille, H. Choi, and R. G. Baraniuk, "Distributed Wavelet Analysis for Irregular Sensor Network Grids," *IEEE Workshop on Statistical Signal Processing – SSP'05*, Bordeaux, France, July 2005.
- S. Palchadhuri, R. Kumar, R. G. Baraniuk, and D. B. Johnson, "Design of Adaptive Overlays for Multi-scale Communication in Sensor Networks," *IEEE International Conference on Distributed Computing in Sensor Systems*, Columbus, OH, June 2005.
- S. Sarvotham, D. Baron, R. G. Baraniuk, "Non-Asymptotic Performance of Symmetric Slepian-Wolf Coding," *Conference on Information Sciences and Systems (CISS)*, Baltimore, March 2005.
- M. Wakin, D. Donoho, H. Choi, and R. G. Baraniuk, "Multiscale Navigation on Non-Differentiable Manifolds," special session on Higher-Dimensional Geometry in Signal Processing, *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'05*, Philadelphia, March 2005.
- R. Wagner, S. Sarvotham, and R. G. Baraniuk, "A Multiscale Data Representation for Distributed Sensor Networks," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'05*, Philadelphia, March 2005.
- H. Choi and R. G. Baraniuk, "Multiscale Manifold Representation and Modeling," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'05*, Philadelphia, March 2005.
- R. King, R. Riedi, and R. G. Baraniuk, "TCP-Africa: An Adaptive and Fair Rapid Increase Rule for Scalable TCP," *IEEE INFOCOM*, Miami, March 2005.
- R. King, R. Riedi, and R. G. Baraniuk, "Evaluating and Improving TCP-Africa: an Adaptive and Fair Rapid Increase Rule for Scalable TCP," *Third International Workshop on Protocols for Fast Long-Distance Networks – PFLDNET'05*, Lyon, France, February 2005.
- N. Ahmed and R. G. Baraniuk, "Delay-limited Throughput Maximization for Fading Channels using Rate and Power Control," *IEEE Globecom*, Symposium on Wireless Communications, Networks and Systems, Dallas, December 2004.
- J. P. Frantz, R. G. Baraniuk, D. L. Jones, and H. Choi, "Multilingual Open-Content Signal Processing Laboratories in Connexions," *IEEE Region 10 (Asia/Pacific) Annual Conference*, Thailand, November 2004.
- N. Ahmed and R. G. Baraniuk, "Throughput Maximization for ARQ-like Systems in Fading Channels with Coding and Queuing Delay Constraints," *38th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2004.
- D. Baron, A. Khojastepour, and R. G. Baraniuk, "How Quickly Can We Approach Capacity for the Gaussian Channel?" *38th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2004.
- W. Mantzel, H. Choi, and R. G. Baraniuk, "Distributed Camera Network Localization," *38th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2004.

- C. S. Burrus, R. G. Baraniuk, J. P. Frantz, and C. Holmes, "Connexions: Sharing Knowledge and Building Communities for Global Education," *ASEE International Colloquium on Engineering Education*, Beijing, China, September 2004.
- D. Baron, A. Khojastepour, and R. G. Baraniuk, "Excess rates of non-asymptotic Slepian-Wolf coding," *Forty-Second Annual Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September 2004.
- W. Chan, H. Choi, and R. G. Baraniuk, "Quaternion Wavelets for Image Analysis and Processing," *IEEE International Conference on Image Processing (ICIP)*, Singapore, October 2004.
- V. Chandrasekaran, M. Wakin, D. Baron, and R. G. Baraniuk, "Surflats: A Sparse Representation for Multidimensional Functions Containing Smooth Discontinuities," *IEEE International Symposium on Information Theory – ISIT*, Chicago, June 2004.
- V. J. Ribeiro, R. Riedi, and R. G. Baraniuk, "Spatio-Temporal Available Bandwidth Estimation with STAB," *ACM Sigmetrics/Performance* (poster), June 2004.
- G. Henry and R. G. Baraniuk, "Peer to Peer Collaboration using Connexions," *ASEE Annual Conference, Information Systems Division*, Salt Lake, June 2004.
- H. Choi, R. G. Baraniuk, D. L. Jones, and L. C. Potter, "Community Driven Digital Signal Processing Laboratories in Connexions," *ASEE Annual Conference, Computers in Education Division*, Salt Lake, June 2004.
- F. Fernandes, M. Wakin, and R. G. Baraniuk, "Non-Redundant, Linear-Phase, Semi-Orthogonal, Directional Complex Wavelets," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'04*, Montreal, May 2004.
- A. Khojastepour, B. Aazhang, and R. G. Baraniuk, "Contraction, Smoothness, and Lowpass Filtering," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'04*, Montreal, May 2004.
- W. Chan, H. Choi, and R. G. Baraniuk, "Directional Hypercomplex Wavelets for Multidimensional Signal Analysis and Processing," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'04*, Montreal, May 2004.
- V. Delouille, R. Neelamani, and R. G. Baraniuk, "Robust Distributed Estimation in Sensor Networks using the Embedded Polygons Algorithm," *International Symposium on Integrated Processing in Sensor Networks (IPSN)*, Berkeley, CA, April 2004.
- V. Chandrasekaran, M. Wakin, D. Baron, and R. G. Baraniuk, "Sparse Approximation of Higher Dimensional Functions Containing Smooth Discontinuities," *Conference on Information Sciences and Systems (CISS)*, Princeton, March 2004.
- D. Baron, A. Singer, and R. G. Baraniuk, "Probability Assignments with Worst-Case Coding Length Constraints," *Conference on Information Sciences and Systems (CISS)*, Princeton, March 2004.
- V. Ribeiro, R. Riedi, and R. G. Baraniuk, "Spatio-Temporal Available Bandwidth Estimation for High-Speed Networks," *ISMA 2003 Bandwidth Estimation Workshop (Best)*, CAIDA, La Jolla, CA, December 2003.
- M. B. Wakin, M. T. Orchard, R. G. Baraniuk, and V. Chandrasekaran, "Phase and Magnitude Perceptual Sensitivities in Nonredundant Complex Wavelet Representations," *37th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2003.
- N. Ahmed and R. G. Baraniuk, "Throughput Measures for Delay-Constrained Communications in Fading Channels," *Allerton Conference on Communication, Control, and Computing*, Allerton, IL, October 2003.

- V. Delouille, R. Neelamani, V. Chandrasekaran, and R. G. Baraniuk, "The Embedded Triangles Algorithm for Distributed Estimation in Sensor Networks," *IEEE Statistical Signal Processing Workshop*, St. Louis, September 2003.
- V. J. Ribeiro, R. Riedi, and R. G. Baraniuk, "Optimal Sampling Strategies for Multiscale Models with an Application to Network Traffic Measurement," *IEEE Statistical Signal Processing Workshop*, St. Louis, September 2003.
- R. Neelamani, R. de Queiroz, Z. Fan, and R. G. Baraniuk, "JPEG Compression History Estimation for Color Images," *IEEE International Conference on Image Processing (ICIP)*, Barcelona, Spain, September 2003.
- R. Wagner, R. D. Nowak, and R. G. Baraniuk, "Distributed Image Compression for Sensor Networks using Correspondence Analysis and Super-Resolution," *IEEE International Conference on Image Processing (ICIP)*, Barcelona, Spain, September 2003.
- J. K. Romberg, M. B. Wakin, R. G. Baraniuk, "Approximation and Compression of Piecewise Smooth Images Using a Wavelet/Wedgelet Geometric Model," *IEEE International Conference on Image Processing (ICIP)*, Barcelona, Spain, September 2003.
- H. Choi and R. G. Baraniuk, "Interpolation and Denoising of Piecewise Smooth Signals by Wavelet Regularization," *Wavelets X in SPIE International Symposium on Optical Science and Technology*, San Diego, August 2003.
- M. B. Wakin, J. K. Romberg, H. Choi, and R. G. Baraniuk, "Geometric Methods for Wavelet-Based Image Compression," *Wavelets X in SPIE International Symposium on Optical Science and Technology*, San Diego, August 2003.
- J. K. Romberg, M. B. Wakin, H. Choi, and R. G. Baraniuk, "A Geometric Hidden Markov Tree Wavelet Model," *Wavelets X in SPIE International Symposium on Optical Science and Technology*, San Diego, August 2003.
- J. K. Romberg, M. Wakin, and R. G. Baraniuk, "Multiscale Geometric Image Processing," *SPIE Visual Communications and Image Processing (VCIP)*, Lugano, Switzerland, July 2003.
- S. Lavu, H. Choi, R. G. Baraniuk, "Geometry Compression of Normal Meshes using the Estimation-Quantization Algorithm," *Eurographics Symposium on Geometry Processing (SGP)*, Aachen, Germany, June 2003.
- S. Appadwedula, R. G. Baraniuk, et al., "Open Content Signal Processing Laboratories in Connexions," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'03*, Hong Kong, April 2003.
- R. van Spaendonck, T. Blu, R. G. Baraniuk, and M. Vetterli, "Orthogonal Hilbert Transform Filterbanks and Wavelets," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'03*, Hong Kong, April 2003.
- V. Riberio, R. Riedi, R. G. Baraniuk, J. Navratil, L. Cottrell, "PathChirp: Efficient Available Bandwidth Estimation for Network Paths," *Passive Active Measurement Workshop – PAM2003*, La Jolla, CA, April 6–8, 2003 (winner of best student paper award).
- S. Lavu, H. Choi, R. G. Baraniuk, "Estimation-Quantization Geometry Coding Using Normal Meshes," *IEEE Data Compression Conference (DCC)*, Snowbird, Utah, March 2003.
- N. Ahmed and R. G. Baraniuk, "Asymptotic Performance of Transmit Diversity via OFDM for Multipath Channels," *IEEE Globecom*, Taipei, Taiwan, November 2002.

- M. B. Wakin, J. K. Romberg, H. Choi, and R. G. Baraniuk, "Geometric Tools for Image Compression," *36th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2002.
- S. Sarvotham, R. H. Riedi, and R. G. Baraniuk, "Connection-Level Modeling of Network Traffic," *36th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2002.
- J. K. Romberg, M. B. Wakin, and R. G. Baraniuk, "Multiscale Wedgelet Image Analysis: Fast Decompositions and Modeling," *IEEE International Conference on Image Processing (ICIP)*, Rochester, NY, September 2002.
- M. B. Wakin, J. K. Romberg, H. Choi, and R. G. Baraniuk, "Rate-Distortion Optimized Image Compression Using Wedgelets," *IEEE International Conference on Image Processing (ICIP)*, Rochester, NY, September 2002.
- N. Ahmed, N. Warke, and R. G. Baraniuk, "Blind Crosstalk Cancellation for DMT Systems," *IEEE ETTC*, Richardson, TX, September 2002.
- X. Wang, S. Sarvotham, R. H. Riedi, and R. G. Baraniuk, "Network Traffic Modeling using Connection-Level Information," *Proc. SPIE ITCOM*, Boston, MA, August 2002.
- B. Hendricks, R. Reedstrom, R. G. Baraniuk, D. H. Johnson, W. L. Wilson, G. Henry, "Connexions: MathML and Collaborative Curriculum Development in Engineering," International Conference on MathML and Math on the Web," Chicago, June 2002.
- R. L. C. van Spaendonck, F. Fernandes, R. G. Baraniuk, J. T. Fokkema, "Local Hilbert Transformation for Seismic Attributes," *EAGE-02*, Florence, Italy, May 2002.
- S. Sarvotham, X. Wang, R. H. Riedi, and R. G. Baraniuk, "Additive and Multiplicative Mixture trees for Network Traffic Modeling," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'02*, Orlando, May 2002.
- R. G. Baraniuk et al, "Connexions: Education for a Networked World," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'02*, Orlando, May 2002.
- M. B. Wakin, J. K. Romberg, H. Choi, and R. G. Baraniuk, "Image Compression Using an Efficient Edge Cartoon + Texture Model," *IEEE Data Compression Conference – DCC*, Snowbird, UT, April 2002.
- X. Wang, S. Sarvotham, R. H. Riedi, and R. G. Baraniuk, "Connection-Level Modeling of Network Traffic," *DIMACS Workshop on Internet and WWW Measurement, Mapping and Modeling*, Rutgers, NJ, February 2002.
- N. Ahmed, R. G. Baraniuk, and D. P. Shaver, "Optimal Transmit Spectra for Communication in the Presence of Crosstalk and Imperfect Echo Cancellation," *IEEE Globecom*, San Antonio, TX, November 2001.
- S. Sarvotham, R. Riedi, and R. G. Baraniuk "Connection-level Analysis and Modeling of Network Traffic," *2001 ACM SIGCOMM Internet Measurement Workshop*, San Francisco, November 2001.
- E. Monsen, J. E. Odegard, H. Choi, J. K. Romberg, and R. G. Baraniuk, "Seismic Texture Classification by Hidden Markov Tree Modeling of Complex Wavelet Transform," *IEEE NORSIG*, Trondheim, Norway, October 2001 (Conference Best Paper Award).
- M. Jansen, H. Choi, S. Lavu, and R. G. Baraniuk, "Multiscale Image Processing Using Normal Triangulated Meshes," *IEEE International Conference on Image Processing (ICIP)*, Thessaloniki, Greece, October 2001.
- J. K. Romberg, H. Choi, and R. G. Baraniuk, "Multiscale Edge Grammars for Complex Wavelet Transforms," *IEEE International Conference on Image Processing (ICIP)*, Thessaloniki, Greece, October 2001.

- R. Neelamani, R. de Queiroz, and R. G. Baraniuk, "Compression Color Space Estimation of JPEG Images using Lattice Basis Reduction," *IEEE International Conference on Image Processing (ICIP)*, Thessaloniki, Greece, October 2001.
- N. Ahmed, R. G. Baraniuk, and D. Shaver, "Optimal Transmit Spectra for Communication in the Presence of Crosstalk and Imperfect Echo Cancellation," *IEEE ETS Symposium*, Dallas, TX September 2001.
- R. Neelamani, R. de Queiroz, and R. G. Baraniuk, "Lattice Algorithms for Compression Color Space Estimation in JPEG Images," *8th International Workshop on Combinatorial Image Analysis – IW-CIA 2001*, Philadelphia, August 2001. Published in *Electronic Notes in Theoretical Computer Science*, vol. 46, 2001.
- V. J. Ribeiro, R. H. Riedi, and R. G. Baraniuk, "Wavelets and Multifractals for Network Traffic Modeling and Inference," invited paper at *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'01*, Salt Lake City, Utah, May 2001.
- U. Ndili, R. D. Nowak, R. G. Baraniuk, H. Choi, and M. Figueredo, "Coding Theoretic Approach to Unsupervised Segmentation of SAR Imagery," *SPIE's 15th Annual International Symposium on Aerospace / Defense Sensing, Simulation, and Controls*, Orlando, FL, April 2001.
- R. Neelamani, R. D. Nowak, and R. G. Baraniuk, "Model-based Inverse Halftoning with Wavelet-Vaguelette Deconvolution," *IEEE International Conference on Image Processing (ICIP)*, Vancouver, October 2000.
- H. Choi, J. K. Romberg, R. G. Baraniuk, N. G. Kingsbury, "Multiscale Classification using Complex Wavelets," *IEEE International Conference on Image Processing (ICIP)*, Vancouver, October 2000.
- T. Dorney, R. G. Baraniuk, and D. Mittleman, "Imaging with THz Pulses," *IEEE International Conference on Image Processing (ICIP)*, Vancouver, October 2000.
- V. Ribeiro, M. Coates, R. Riedi, S. Sarvotham, B. Hendricks, R. G. Baraniuk, "Multifractal Cross-Traffic Estimation," *ITC Specialist Seminar on IP Traffic Measurement*, Monterey, CA, September 2000.
- R. H. Riedi, V. J. Ribeiro, M. S. Crouse and R. G. Baraniuk, "Network Traffic Modeling Using a Multifractal Wavelet Model," *Proc. European Congress of Mathematics*, Barcelona, Spain, July 2000.
- R. Neelamani, J. K. Romberg, R. Riedi, H. Choi, and R. G. Baraniuk, "Multiscale Image Segmentation Using Joint Shape and Texture Analysis," *SPIE Technical Conference on Wavelet Applications in Signal Processing VIII*, Vol. 4119, San Diego, July 2000.
- H. Choi and R. G. Baraniuk, "Information-theoretic Interpretation of Besov Spaces," *SPIE Technical Conference on Wavelet Applications in Signal Processing VIII*, Vol. 4119, San Diego, July 2000.
- R. L. Claypoole and R. G. Baraniuk, "A Multiresolution Wedgelet Transform for Image Processing," *SPIE Technical Conference on Wavelet Applications in Signal Processing VIII*, Vol. 4119, San Diego, July 2000.
- G. Davis, W. Sweldens, R. L. Claypoole and R. G. Baraniuk, "Locally adapted nonlinear wavelet transforms," *SPIE Technical Conference on Wavelet Applications in Signal Processing VIII*, Vol. 4119, San Diego, July 2000.
- J. K. Romberg, R. Riedi, H. Choi, and R. G. Baraniuk, "Multiscale Multiplicative Image Decompositions: Analysis and Modeling," *SPIE Technical Conference on Wavelet Applications in Signal Processing VIII*, Vol. 4119, San Diego, July 2000.
- T. Dorney, S. Bhashyam, A. Doran, H. Choi, P. Flandrin, and R. G. Baraniuk, "Edge Localized Image Sharpening via Reassignment with Application to Computed Tomography," *SPIE Technical Conference on Mathematical Modeling, Estimation, and Imaging*, Vol. 4121, San Diego, July 2000.

- T. Dorney, J. Johnson, D. Mittleman, and R. G. Baraniuk, "Imaging with Terahertz Pulses," *SPIE Technical Conference on Applications of Digital Image Processing XXIII*, Vol. 4115, San Diego, July 2000 .
- R. G. Baraniuk, M. Coates, T. P. H. Steeghs, "Hybrid Linear/Bilinear Time-frequency Attributes," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'00*, Istanbul, Turkey, June 2000.
- H. Choi, J. K. Romberg, R. G. Baraniuk, and N. G. Kingsbury, "Hidden Markov Tree Modeling of Complex Wavelet Transforms," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'00*, Istanbul, Turkey, June 2000.
- J. Tian, R. G. Baraniuk, R. O. Wells, Jr., D. M. Tan, and H. R. Wu, "Wavelet Folding and Decorrelation across Scale," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'00*, Istanbul, Turkey, June 2000.
- V. Venkatachalam, R. D. Nowak, M. Figueiredo, and R. G. Baraniuk, "Unsupervised SAR Image Segmentation using Adaptive Recursive Partitioning," *SPIE's 14th Annual International Symposium on Aerospace/Defense Sensing, Simulation, and Controls*, vol. 4053, Orlando, FL, April 2000.
- V. Venkatachalam, H. Choi, and R. G. Baraniuk, "Multiscale SAR Segmentation using Wavelet-domain Hidden Markov Tree Models," *SPIE's 14th Annual International Symposium on Aerospace/Defense Sensing, Simulation, and Controls*, vol. 4053, Orlando, FL, April 2000.
- V. J. Ribeiro, R. H. Riedi, M. S. Crouse, and R. G. Baraniuk, "Multiscale Queuing Analysis of Long-Range-Dependent Network Traffic," *IEEE INFOCOM*, Tel Aviv, Israel, March 2000.
- V. J. Ribeiro, R. H. Riedi, M. S. Crouse, and R. G. Baraniuk, "Multifractal Network Traffic Modeling," *Conference on Information Sciences and Systems CISS*, Princeton, March 2000.
- H. Choi and R. G. Baraniuk, "Multiscale Document Segmentation using Wavelet-domain Hidden Markov Models," *SPIE Electronic Imaging 2000*, San Jose, January, 2000.
- R. V. Gaikwad and R. G. Baraniuk, "Joint Signaling Techniques for Crosstalk-dominated Communication Channels," *IEEE GlobeComm '99*, Rio de Janeiro, Brazil, December, 1999.
- R. L. C. van Spaendonck and R. G. Baraniuk, "Directional Scale Analysis for Seismic Interpretation," *69th Meeting of the Society of Exploration Geophysicists (SEG)*, Houston, November 1999.
- I. Magrin-Chagnolleau and R. G. Baraniuk, "Empirical Mode Decomposition based Frequency Attributes," *69th Meeting of the Society of Exploration Geophysicists (SEG)*, Houston, November 1999.
- I. Magrin-Chagnolleau, H. Choi, R. L. C. van Spaendonck, T. P. H. Steeghs, and R. G. Baraniuk. "Multiscale Texture Segmentation of Dip-Cube Slices using Wavelet-domain Hidden Markov Trees," *69th Meeting of the Society of Exploration Geophysicists (SEG)*, Houston, November 1999.
- B. M. Hendricks, H. Choi, and R. G. Baraniuk, "Analysis of Multiscale Texture Segmentation using Wavelet-Domain Hidden Markov Models" *33rd Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 1999.
- J. K. Romberg, H. Choi, and R. G. Baraniuk, "Shift Invariant Hidden Markov Tree Models for Bayesian Image Processing," *33rd Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 1999.
- H. Choi and R. G. Baraniuk, "Multiple Basis Wavelet Denoising using Besov Projections," *IEEE International Conference on Image Processing (ICIP)*, Kobe, Japan, October 1999.
- J. K. Romberg, H. Choi, and R. G. Baraniuk, "Bayesian Wavelet-domain Image Modeling using Hidden Markov Trees," *IEEE International Conference on Image Processing (ICIP)*, Kobe, Japan, October 1999.

- R. Neelamani, H. Choi, and R. G. Baraniuk, "Wavelet-domain Regularized Deconvolution for Ill-Conditioned Systems," *IEEE International Conference on Image Processing (ICIP)*, Kobe, Japan, October 1999.
- R. G. Baraniuk, "Optimal Tree Approximation with Wavelets" *SPIE Technical Conference on Wavelet Applications in Signal Processing VII*, (Invited session on wavelet-domain statistical modeling), Vol. 3813, Denver, July 1999. Also Isaac Newton Institute Technical Report NI99014–NSP, Cambridge University.
- R. Neelamani, H. Choi, and R. G. Baraniuk, "Wavelet-based Deconvolution using Optimally Regularized Inversion for Ill-Conditioned Systems," *SPIE Technical Conference on Wavelet Applications in Signal Processing VII*, Vol. 3813, Denver, July 1999.
- R. L. Claypoole and R. G. Baraniuk, "Lifting for Nonlinear Wavelet Image Processing," *SPIE Technical Conference on Wavelet Applications in Signal Processing VII*, (Invited session on multirate filter bank applications), Vol. 3813, Denver, July 1999.
- H. Choi and R. G. Baraniuk, "Wavelet Statistical Models and Besov Spaces," *SPIE Technical Conference on Wavelet Applications in Signal Processing VII*, Vol. 3813, Denver, July 1999.
- H. Choi and R. G. Baraniuk, "Image Segmentation using Wavelet-domain Classification," *SPIE Technical Conference on Mathematical Modeling, Bayesian Estimation, and Inverse Problems*, Denver, July 1999.
- J. Romberg, H. Choi, and R. G. Baraniuk, "Bayesian Tree-Structured Image Modeling using Wavelet-domain Hidden Markov Models," *SPIE Technical Conference on Mathematical Modeling, Bayesian Estimation, and Inverse Problems*, Denver, July 1999.
- M. Gupta, D. Mittleman, and R. G. Baraniuk, "Imaging with THz Radiation," *Second Japan-US Symposium on Advances in NonDestructive Testing*, pp. 451–456, Hawaii, June, 1999.
- R. V. Gaikwad and R. G. Baraniuk, "Optimal Transmit Spectra for Communication in the Presence of Crosstalk," *International Conference on Communications (ICC), Eighth Communications Theory Mini-Conference*, Vancouver, June 1999.
- V. J. Ribeiro, R. H. Riedi, M. S. Crouse, and R. G. Baraniuk, "Simulation of Non-Gaussian Long-Range-Dependent Traffic using Wavelets," *ACM SIGMETRICS'99*, Atlanta, May 1999.
- R. V. Gaikwad and R. G. Baraniuk, "Spectral Optimization for Communication in the Presence of Crosstalk," *Conference on Information Sciences and Systems (CISS)*, Baltimore, March 1999.
- H. Choi and R. G. Baraniuk, "Interpolation and Denoising of Nonuniformly Sampled Data using Wavelet-domain Processing," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'99*, Vol. III, pp. 1645–1648, Phoenix, March 1999.
- R. Neelamani, H. Choi, and R. G. Baraniuk, "Wavelet-based Deconvolution for Ill-Conditioned Systems," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'99*, Vol. VI, pp. 3241–3244, Phoenix, March 1999.
- M. S. Crouse, H. Choi, and R. G. Baraniuk, "Multiscale Statistical Image Processing using Tree-Structured Probability Models," *IEEE Information Theory Workshop on Detection, Estimation, Classification and Imaging (DECI)* (Invited session on signal processing), Santa Fe, New Mexico, February 1999.
- R. H. Riedi, M. S. Crouse, V. J. Ribeiro, and R. G. Baraniuk, "Network Traffic Modeling using a Multifractal Wavelet Model," *5th IEEE International Symposium on Digital Signal Processing for Communication Systems, DSPCS '99*, Perth, Australia, February 1999.

- R. V. Gaikwad and R. G. Baraniuk, "Optimal Transmit Spectra for Communication on Digital Subscriber Lines," *5th IEEE International Symposium on Digital Signal Processing for Communication Systems, DSPCS '99*, Perth, Australia, February 1999.
- D. Mittleman, R. Neelamani, M. Gupta, R. G. Baraniuk, and M. C. Nuss, "Recent Advances in Imaging and Spectroscopy with T-Rays," *International Conference on Lasers '98*, Tucson, AZ, December 1998.
- H. Choi and R. G. Baraniuk, "Multiscale Texture Segmentation using Wavelet-Domain Hidden Markov Models" *32nd Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 1998.
- P. Gonçalves, R. H. Riedi, and R. G. Baraniuk, "Simple Statistical Analysis of Wavelet-based Multifractal Spectrum Estimation," *32nd Asilomar Conference on Signals, Systems, and Computers* (Invited session on spectrum estimation), Pacific Grove, CA, November 1998.
- R. L. Claypoole, R. G. Baraniuk, and R. D. Nowak, "Non-Linear Wavelet Transforms using Lifting," *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Pittsburgh, October 1998.
- H. Choi and R. G. Baraniuk, "Analysis of Wavelet-Domain Wiener Filters," *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Pittsburgh, October 1998.
- M. S. Crouse, R. H. Riedi, V. J. Ribeiro, and R. G. Baraniuk, "A Multifractal Wavelet Model for Positive Processes," *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Pittsburgh, October 1998.
- R. L. Claypoole and R. G. Baraniuk, "Flexible Wavelet Transforms using Lifting," *Society of Exploration Geophysicists 68th Annual Meeting* (Invited session on frontier technologies), New Orleans, September 1998.
- M. S. Crouse, R. H. Riedi, V. J. Ribeiro, and R. G. Baraniuk, "Multifractal Signal Models with Application to Network Traffic," *IEEE DSP Workshop*, Bryce Canyon, UT, August 1998.
- D. M. Mittleman, R. Neelamani, R. G. Baraniuk, and M. C. Nuss, "Applications of Terahertz Imaging," *IEEE-OSA Topical Meeting on Nonlinear Optics*, Kauai, Hawaii, August 1998.
- M. S. Crouse and R. G. Baraniuk, "Simplified Wavelet-Domain Hidden Markov Models Using Contexts," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'98*, Seattle, May 1998.
- R. L. Claypoole, R. G. Baraniuk, and R. D. Nowak "Adaptive Wavelet Transforms via Lifting," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'98*, Seattle, May 1998.
- R. L. Claypoole, G. Davis, W. Sweldens, and R. G. Baraniuk, "Adaptive Wavelet Transforms for Image Coding using Lifting," *Digital Compression Conference*, Snowbird, UT, March 1998.
- D. M. Mittleman, R. G. Baraniuk, and M. C. Nuss, "Applications of Terahertz Imaging," *International Topical Workshop on Contemporary Photonic Technologies*, Tokyo, Japan, January 1998.
- R. L. Claypoole, G. Davis, W. Sweldens, and R. G. Baraniuk, "Nonlinear Wavelet Transforms for Image Coding," *31st Asilomar Conference on Signals, Systems, and Computers* (Invited session on image coding), Pacific Grove, CA, November 1997.
- M. S. Crouse and R. G. Baraniuk, "Contextual Hidden Markov Models for Wavelet-domain Signal Processing," *31st Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 1997.
- J. E. Odegard, R. G. Baraniuk, and K. Oehler, "Instantaneous Frequency Estimation using the Reassignment Method," *Society of Exploration Geophysicists 67th Annual Meeting* (Invited session on frontier technologies), Dallas, November 1997.

- R. D. Nowak and R. G. Baraniuk, "Wavelet Transforms for Nonlinear Signal Processing," *IEEE Workshop on Nonlinear Signal and Image Processing* (Invited session on Volterra filters), Mackinac Island, MI, September 1997.
- S. Ghael, A. M. Sayeed, and R. G. Baraniuk, "Improved Wavelet Denoising via Empirical Wiener Filtering," *SPIE Technical Conference on Wavelet Applications in Signal Processing VI*, San Diego, July 1997.
- M. S. Crouse, R. D. Nowak, and R. G. Baraniuk, "Statistical Signal Processing Using Wavelet-Domain Hidden Markov Models," *SPIE Technical Conference on Wavelet Applications in Signal Processing VI*, San Diego, July 1997.
- R. D. Nowak and R. G. Baraniuk, "Wavelet Domain Filtering for Photon Imaging Systems," *SPIE Technical Conference on Wavelet Applications in Signal Processing VI*, San Diego, July 1997.
- M. S. Crouse, R. D. Nowak, K. Mhirsi, and R. G. Baraniuk, "Detection and Classification using Wavelet-Domain Hidden Markov Models," *SPIE Technical Conference on Advanced Signal Processing Algorithms, Architectures, and Implementations VII* (Invited session on time-frequency based detection and classification), San Diego, July 1997.
- M. S. Crouse, R. D. Nowak, and R. G. Baraniuk, "Statistical Signal and Image Processing using Wavelet-Domain Hidden Markov Models," *29th Symposium on the Interface: Computing Science and Statistics* (Invited session on signal processing), Houston, TX, May 1997.
- D. H. Johnson, P. Gonçalves, and R. G. Baraniuk, "Improved Type-based Detection of Analog Signals," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'97*, Munich, Germany, April 1997.
- R. D. Nowak and R. G. Baraniuk, "Wavelet-Based Nonlinear Signal Processing," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'97*, Munich, Germany, April 1997.
- M. S. Crouse, R. D. Nowak, and R. G. Baraniuk, "Signal Estimation using Wavelet-Markov Models," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'97*, Munich, Germany, April 1997.
- R. D. Nowak, D. J. Nowak, R. G. Baraniuk, and R. S. Hellman, "Wavelet Domain Filtering for Nuclear Medicine Imaging," *IEEE 1996 Medical Imaging Conference*, Anaheim, CA, November, 1996.
- M. S. Crouse, R. D. Nowak, and R. G. Baraniuk, "Hidden Markov Models for Wavelet-based Signal Processing," *30th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 1996.
- R. G. Baraniuk, "Joint Distributions of Arbitrary Variables Made Easy," *Seventh IEEE Digital Signal Processing Workshop*, Loen, Norway, September 1996.
- C. C. Carson and R. G. Baraniuk, "Window Design for Signal-Dependent Spectrogram using Optimal-Kernel Techniques," *SPIE Technical Conference on Advanced Signal Processing Algorithms, Architectures, and Implementations VI*, Denver, CO, August, 1996.
- M. Bayram and R. G. Baraniuk, "Multiple Window Time-Frequency and Time-Scale Analysis," *SPIE Technical Conference on Advanced Signal Processing Algorithms, Architectures, and Implementations VI*, Denver, CO, August, 1996.
- R. D. Nowak and R. G. Baraniuk, "Wavelet-based Decompositions for Nonlinear Signal Processing," *SPIE Conference on Wavelet Applications in Signal and Image Processing*, Denver, CO, August, 1996.
- M. Pasquier, P. Gonçalves, and R. G. Baraniuk, "Hybrid Linear/Bilinear Time-Scale Analysis," *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Paris, France, June 1996.

- M. Bayram and R. G. Baraniuk, "Multiple Window Time-Frequency Analysis," *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Paris, France, June 1996.
- L. F. Wisur-Olsen and R. G. Baraniuk, "Optimal Phase Kernels for Time-Frequency Analysis," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'96*, Atlanta, GA, May 1996.
- P. Gonçalves and R. G. Baraniuk, "Pseudo Affine Wigner Distributions," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'96*, Atlanta, GA, May 1996.
- R. D. Nowak and R. G. Baraniuk, "Optimally Weighted Highpass Filters using Multiscale Analysis," *IEEE Southwest Symposium on Image Analysis and Interpretation*, San Antonio, TX, April 1996
- M. Bayram and R. G. Baraniuk, "Multiple Window Time-Varying Spectral Analysis," *Conference on Information Sciences and Systems (CISS)*, Princeton, NJ, March 1996.
- J. E. Odegard, H. Guo, C. S. Burrus, and R. G. Baraniuk, "Joint Compression and Speckle Reduction of SAR Images using Embedded Zerotree Models," *Proceedings of the Ninth IMDSP Workshop on Image and Multidimensional Digital Signal Processing*, Belize City, Belize, March 1996.
- R. G. Baraniuk, P. Flandrin, and O. Michel, "Measuring Time-Frequency Information and Complexity Using the Rényi Entropies," *IEEE International Symposium on Information Theory*, Whistler, BC, September 1995.
- K. A. Farry, R. G. Baraniuk, and I. D. Walker, "Stationary Myoelectric Spectral Estimates from a Nonparametric, Low Bias, and Low Variance Estimator," *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)*, Montreal, September 1995.
- K. A. Farry, R. G. Baraniuk, and I. D. Walker, "Nonparametric, Low Bias, and Low Variance Time-Frequency Analysis of Myoelectric Signals," *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)*, Montreal, September 1995.
- K. A. Farry, I. D. Walker, and R. G. Baraniuk, "Functional Separation of Myoelectric Signals using Thomson's Multiple Window Method," *Myoelectric Control '95 (MEC'95)*, Fredericton, NB, Canada, August 1995.
- R. G. Baraniuk, "Marginals vs. Covariance in Joint Distribution Theory," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'95*, Detroit, MI, May 1995.
- R. G. Baraniuk, "Nonlinear Wigner-Ville Spectrum Estimation using Wavelet Soft-Thresholding," *SPIE Technical Conference 2491 on Wavelet Applications for Dual-Use*, Orlando, FL, April 1995.
- R. G. Baraniuk, "Warping Time-Frequency and Time-Scale Representations to Match Signals," *SPIE Technical Conference 2488 on Visual Information Processing IV* (Invited session on image processing), Orlando, FL, April 1995.
- R. G. Baraniuk, "Wavelet Soft-Thresholding Time-Frequency Representations," *IEEE International Conference on Image Processing (ICIP)*, Austin, TX, November 1994.
- R. G. Baraniuk, "Warped Perspectives in Time-Frequency Analysis," *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Philadelphia, PA, October 1994.
- R. G. Baraniuk, "Wigner-Ville Spectrum Estimation via Wavelet Soft-Thresholding," *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Philadelphia, PA, October 1994.
- O. Michel, R. G. Baraniuk, and P. Flandrin "Time-Frequency Based Distance and Divergence Measures," *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Philadelphia, PA, October 1994.

- L. Cohen and R. G. Baraniuk, "On Joint Distributions of Arbitrary Variables," *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Philadelphia, PA, October 1994.
- R. G. Baraniuk, "Signal-Dependent Time-Frequency Representations," *Thematic Days on Time-Frequency, Wavelets, and Multiresolution: Theory, Models, and Applications* (Invited) Lyon, France, March 1994.
- R. G. Baraniuk, "Beyond Time-Frequency Analysis: Energy Densities in One and Many Dimensions," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'94*, Adelaide, Australia, April 1994.
- P. Flandrin, R. G. Baraniuk, and O. Michel, "Time-Frequency Complexity and Information," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'94*, Adelaide, Australia, April 1994.
- R. G. Baraniuk, P. Flandrin, and O. Michel, "Information and Complexity on the Time-Frequency Plane," *14ème Colloque GRETSI*, Juan-Les-Pins, France, September 1993.
- R. G. Baraniuk and D. L. Jones, "Unitary Equivalence: A New Twist on Signal Processing," *Proceedings of the International Symposium on the Mathematical Theory of Networks and Systems (MTNS)* (Invited session on signal processing), Regensburg, Germany, August 1993.
- R. G. Baraniuk and D. L. Jones, "Warped Wavelet Bases: Unitary Equivalence and Signal Processing," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'93*, Minneapolis, MN, March 1993.
- D. L. Jones and R. G. Baraniuk, "An Adaptive Optimal-Kernel Time-Frequency Representation," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'93*, Minneapolis, MN, March 1993.
- D. L. Jones and R. G. Baraniuk, "A Simple Scheme for Adapting Time-Frequency Representations," *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Victoria, BC, Canada, October 1992.
- R. G. Baraniuk and D. L. Jones, "New Signal-Space Orthonormal Bases Via the Metaplectic Transform," *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, Victoria, BC, Canada, October 1992.
- D. L. Jones and R. G. Baraniuk, "An On-Line Signal-Dependent Time-Frequency Representation," *Fifth IEEE Digital Signal Processing Workshop*, Starved Rock, IL, September 1992.
- R. G. Baraniuk and D. L. Jones, "New Dimensions in Wavelet Analysis," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'92*, San Francisco, CA, May 1992.
- R. G. Baraniuk, D. L. Jones, T. Brotherton, and S. L. Marple, "Applications of Adaptive Time-Frequency Representations to Underwater Acoustic Signal Processing," *25th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 1991.
- D. L. Jones and R. G. Baraniuk, "Efficient Computation of Densely Sampled Wavelet Transforms," *SPIE Technical Conference on Advanced Signal Processing Algorithms, Architectures, and Implementations II*, San Diego, CA, July 1991.
- R. G. Baraniuk and D. L. Jones, "A Radially Gaussian, Signal-Dependent Time-Frequency Representation," *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'91*, Toronto, Canada, May 1991.
- D. L. Jones and R. G. Baraniuk, "Signal Dependent Time-Frequency Representations," *Fourth IEEE Digital Signal Processing Workshop*, New Paltz, NY, September 1990.

R. G. Baraniuk and D. L. Jones, “Optimal Kernels for Time-Frequency Analysis,” *SPIE Technical Conference on Advanced Signal Processing Algorithms, Architectures, and Implementations I* (Invited session on time-frequency analysis), San Diego, CA, July 1990.

BOOK CHAPTERS and OTHER MANUSCRIPTS

S. Shaw, A. Sharma, R. G. Baraniuk, and B. Roy, “Introduction to the Special Section on Machine Learning Applications,” *The Leading Edge*, Vol. 38, Issue 7, pp. 510, July 2018.

N. Finkbeiner, D. C. Williamson, and R. G. Baraniuk, “Encouraging a Yes: Effective Institutional OER Initiatives,” in *The Evolution of Affordable Content Efforts in the Higher Education Environment*, K. Jensen and S. Nackerud, eds., University of Michigan Libraries Publishing, pp. 113–123, 2018.

T. Goldstein, C. Studer, and R. G. Baraniuk, “A Field Guide to Forward-Backward Splitting with a FASTA Implementation,” <http://arxiv.org/abs/1411.3406>, 2015.

A. B. Patel, T. Nguyen, and R. G. Baraniuk, “A Probabilistic Theory of Deep Learning,” <http://arxiv.org/abs/1504.00641>, 2015.

R. G. Baraniuk, N. Finkbeiner, D. Harris, D. Nicholson, and D. C. Williamson, “Free is Not Enough,” in *Open: The Philosophy and Practices that are Revolutionizing Education and Science*, R. S. Jhangiani and R. Biswas-Diener, eds., Ubiquity Press, 2017.

A. C. Sankaranarayanan and R. G. Baraniuk, “Compressive Sensing,” in *Computer Vision*, Springer, 2014.

R. Neelamani, R. D. Nowak, and R. G. Baraniuk, “WInHD: Wavelet-based Inverse Halftoning via Deconvolution,” *Rejecta Mathematica* (inagural issue), 2009.

U. P. Dholakia and R. G. Baraniuk, “The Roles of Social Networks and Communities in Open Education Programs,” in *Social Software and Developing Community Ontologies*, S. Hatzipanagos and S. Warburton, eds., IGI Global Publishing, 2008.

R. G. Baraniuk, “Challenges and Opportunities for the Open Education Movement: A Connexions Case Study,” in *Opening Up Education — The Collective Advancement of Education through Open Technology, Open Content, and Open Knowledge*, T. Iiyoshi, M. S. Vijay Kumar, eds., MIT Press, 2008.

J.-P. Ovarlez, P. Gonçalvès, and R. G. Baraniuk, “Analyse Temps-Frequence Quadratique: La Classe Affine et Autres Classes Covariantes,” in *Temps-Fréquence: Notions et Outils*, François Auger, Franz Hlawatsch, and J.-P. Ovarlez, eds., Hermes, Paris, 2004.

R. G. Baraniuk, “Unitarily Equivalent Time-Frequency Analysis,” in *Time-Frequency Signal Analysis and Processing: A Comprehensive Reference*, B. Boashash, ed., Chapter 4.5, pp. 122–127, Elsevier, 2003.

R. G. Baraniuk and D. L. Jones, “Adaptive Time-Frequency Analysis,” *Time-Frequency Signal Analysis and Processing: A Comprehensive Reference*, B. Boashash, ed., Chapter 5.3, pp. 178–184, Elsevier, 2003.

H. Choi and R. G. Baraniuk, “Wavelet Statistical Models and Besov Spaces,” in *Nonlinear Estimation and Classification*, D. D. Denison, M. H. Hansen, C. C. Holmes, B. Mallick, and B. Yu, eds., Springer-Verlag Lecture Notes in Statistics, 2002.

T. P. H. Steeghs, R. G. Baraniuk, and J. E. Odegard, “Time-Frequency Analysis Applications in Geophysics,” in *Applications in Time-Frequency Signal Processing*, A. Papandreou-Suppappola, ed., CRC Press, pp. 307–337, 2002.

M. Bayram and R. G. Baraniuk, “Multiple Window Time-Varying Spectral Analysis,” in *Nonlinear and Nonstationary Signal Processing*, W. Fitzgerald et al, eds., Cambridge University Press, pp. 292–316, 2001.

R. G. Baraniuk, "Signal-Dependent Time-Frequency Representations," Section 6.3 in *Introduction to Time-Frequency Analysis* by S. Qian and D. Chen, Prentice Hall, 1996.

STANDARDS CONTRIBUTIONS

R. V. Gaikwad and R. G. Baraniuk, "Transmit Spectra Adaptive to Noise and Interference at Activation for HDSL2," *TIE1.4/98-258: HDSL2 Standards Meeting*, San Antonio, TX, September 3, 1998.

R. V. Gaikwad and R. G. Baraniuk, "Optimal Transmit Spectra for HDSL2," *TIE1.4: HDSL2 Standards Meeting*, Hunstville, AL, June 4, 1998.

R. V. Gaikwad and R. G. Baraniuk, "Optimal Transmit Spectra for HDSL2 under Peak Frequency-Domain Power Constraint," *TIE1.4: HDSL2 Standards Meeting*, Hunstville, AL, June 4, 1998.

OPINION PIECES and EDITORIALS

R. G. Baraniuk, "Learning Analytics: Power Tools for Education," Electrical and Computer Engineering Department Heads Association *ECE Source Newsletter*, September 2016.

R. G. Baraniuk, "Opening Education," *The Bridge*, National Academy of Engineering, 2013.

R. G. Baraniuk, "Open Education: One Perfect Storm Yields Three Revolutions," *Visión Movistar*, Telefonica, 2012.

R. G. Baraniuk and W. T. Padgett, "Trends in Signal Processing Education," *IEEE Signal Processing Magazine*, 2011.

R. G. Baraniuk, "How Open are Open Educational Resources?" *Domus* (Italy), 923(03/09), March 2009.

R. G. Baraniuk and C. S. Burrus, "Global Warming toward Open Educational Resources," *Communications of the ACM*, Vol. 51, No. 9, September 2008.

J. Wales and R. G. Baraniuk, "Bringing Open Resources to Textbooks and Teaching," *San Francisco Chronicle*, 21 January 2008.

J. Wales and R. G. Baraniuk, "The Open Education Revolution," *Project Syndicate* (37 newspapers worldwide), January–February 2008.

R. G. Baraniuk, C. S. Burrus, and J. Thierstein, "IEEE-SPS and Connexions — An Open Access Education Collaboration," *IEEE Signal Processing Magazine*, November 2007.

R. G. Baraniuk, "The Open Education Movement is Gaining Speed, but Potential Roadblocks Lie Ahead," *Campus Technology / Smart Classroom*, 17 May 2006.

R. G. Baraniuk and W. J. King, "Connexions: Sharing Knowledge and Building Communities," *Sloan-C View*, Vol. 4, Issue 9, September 2005.