RICHARD G. BARANIUK

C. Sidney Burrus Professor
Department of Electrical and Computer Engineering
Rice University
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March 28, 2026

RESEARCH INTERESTS

Machine learning, artificial intelligence for education, signal and image processing, 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

2024–present	SafeInsights	Project Director
2012–present	OpenStax	Founder/Director
2021–present	Rice University	C. Sidney Burrus Professor
2004–2021	Rice University	Victor E. Cameron Professor
2000–2004	Rice University	Professor
1999–2012	Connexions	Founder/Director
1998	Isaac Newton Institute, Cambridge University	Rosenbaum Fellow
1996–2000	Rice University	Associate Professor
1993–present	Ken Kennedy Institute	Member
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

2026 Outstanding Doctoral Thesis Advisor Award (Rice School of Engineering)
2025 IEEE Jack S. Kilby Signal Processing Medal
2023 AMS Josiah Willard Gibbs Lectureship
2022 Member of the National Academy of Engineering

2022 IEEE Signal Processing Society Norbert Wiener Society Award
2022 Winner, Automated Scoring Challenge for The Nation's Report Card, Institute of Education Sciences
2021 Harold W. McGraw, Jr. Prize in Education
2021 IEEE Signal Processing Magazine Best Paper Award
2020 SPARC Innovator Award for OpenStax
2019 Clarivate Analytics Highly Cited Researcher (formerly Thomson Reuters)
2018 Faculty Award for Excellence in Research, Teaching, and Service (Rice)
2018 Clarivate Analytics Highly Cited Researcher (formerly Thomson Reuters)
2017 Vannevar Bush Faculty Fellow (National Security Science and Engineering Faculty Fellow)
2017 Member of the American Academy of Arts and Sciences
2017 Best Paper Honorable Mention, International Conference on Computational Photography (ICCP)
2017 Clarivate Analytics Highly Cited Researcher (formerly Thomson Reuters)
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 Claude Shannon-Harry Nyquist 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 "Daring Dozen" Education Innovator
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 Passive and Active Measurement Workshop Student Paper Award
2003 George R. Brown Award for Superior Teaching (Rice)
2002 Fellow of the Institute of Electrical and Electronic Engineers (IEEE)
2001 IEEE Signal Processing Society Junior Paper Award
2001 IEEE NORSIG Best Paper Award
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 (NSERC) 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 and PROJECT SUPPORT

2025–2028	DOE	*Learning the Stochastic Dynamics of Complex Geophysical Systems*	(co-PI)
2025	Google	Faculty Research Award	
2024–2029	NSF	*SafeInsights: A National Research Infrastructure for Large-Scale Learning Science and Engineering* (Mid-Scale RI-2)	
2024	ONR	*Exploring the Local Geometry of Deep Networks* (DURIP)	
2023–2026	ONR	*Imaging in the Presence of Dynamic Distortions: Fundamental Limits and Practical Approaches*	(co-PI)
2023–2024	Gates Foundation	*Equity-Focused AI Projects*	
2023–2024	Kazanjian Foundation	*Economics AI Tutor*	
2023–2026	IARPA	*AAVISS: Anytime, Anywhere Visualization of Sites*	(co-PI)
2021–2024	AFOSR	*Low-Rank Tensor Decomposition with Deep Network Priors*	
2021–2024	Institute of Education Sciences	*Efficient Education Research via the OpenStax Learning Platform*	
2021–2024	Bill and Melinda Gates Foundation	*OpenStax RAISE Initiative*	
2021–2024	Hewlett Foundation	*OpenStax Textbook Expansion*	
2021–2024	US Department of Education	*OpenStax Textbooks Program*	
2020–2024	Bill and Melinda Gates Foundation	*OpenStax Textbook Expansion*	
2020–2025	ONR	*MURI: Theoretical Foundations of Deep Learning* (Project Director)	
2020–2023	NSF	*Nonspecific DNA Sensors for Scalable Pathogen Diagnostics*	(co-PI)
2020–2021	Rodriguez-Pastor Foundation	*OpenStax Spanish Translation Prototype*	
2020	CZI	*Project Equip, Phase 2*	
2019–2022	ONR	*SubLiME: Sub-Linear Machine learning Engine* (DURIP)	(co-PI)
2019–2022	NSF	*Accelerating STEM Learning Through Large-Scale Data Science*	
2019–2020	NSF	*A Scalable Knowledge Network to Enable Intelligent Textbooks*	
2019–2022	NSF	*A Probabilistic Theory of Deep Learning via Spline Operators*	
2019–2022	NSF	*Enabling Intelligent Cameras in Internet-of-Things via Holistic Platform,*	

		Algorithm, and Hardware Co-design	(co-PI)
2020–2022	NSF	*Harmonizing Predictive Algorithms and Mixed-Signal/Precision Circuits via Computation-Data Access Exchange and Adaptive Dataflows*	(co-PI)
2019–2022	DOE	*Deep Learning for Forecasting Fracture and Fault Evolution*	(co-PI)
2019	ONR	*C3 Lensless: Computation and Communication Enabled on-Chip Lensless Imager*	(co-PI)
2019	CZI	*Project Equip, Phase 1*	
2019	DARPA	*ENIGMA: A Visual Sensor for Privacy Preserving Machine Learning*	(co-PI)
2018–2022	ONR	*Randomized Numerical Linear Algebra for Large-Scale Learning and Inference* (Basic Research Challenge)	
2018–2022	NSF	*Theory and Practice of Randomized Algorithms for Ultra-Large-Scale Signal Processing* (BIGDATA)	(co-PI)
2018–2021	AFOSR	*A Spline Theory of Deep Learning*	
2018	Amazon	*Scaling-up Machine Learning via Probabilistic Hashing*	(co-PI)
2017–2022	DOD	*Vannevar Bush Faculty Fellow* (National Security Science and Engineering Faculty Fellow)	
2017–2020	DARPA	*IBIS: Implantable Bioluminescence Imaging System*	(co-PI)
2017–2020	ONR	*Human-In-The-Loop Machine Learning*	
2017–2018	Bill and Melinda Gates Foundation	*An Open Assessment Network (AN) to Catalyze Improvement of Digital Courseware*	
2017–2018	Open Society Foundations	*AP US History Courseware*	
2016–2019	NSF	*Operationalizing Students' Textbook Annotations to Improve Comprehension and Long-Term Retention*	(co-PI)
2016–2020	DARPA	*OMNISCIENT* (REVEAL Program)	(co-PI)
2016–2017	IBM	*Open Collaborative Research Award*	
2016–2017	IARPA	*MICrONS: Reverse Engineering Neocortical Intelligence*	(co-PI)
2016–2017	Texas Education Agency	*Advanced Placement OpenStax Textbook Development*	
2016–2017	Beneficus Foundation	*OpenStax Tutor V2*	
2016–2017	Maxfield Foundation	*OpenStax Tutor V2*	
2016–2017	Sick Foundation	*OpenStax Tutor V2*	
2016–2017	Katalyst Foundation	*OpenStax Internationalization*	
2016	Hewlett Foundation	*OpenStax Community Outreach*	
2015–2018	ARO	*Information Processing and Fusion via Sparse Factorization*	
2015–2018	NSF	*Lens-Free Imaging: Can Signal Processing Replace Lenses?*	
2015–2018	AFOSR	*Sparse Factor Analysis for Information Extraction and Fusion*	
2015–2017	ONR	*(NCoM) Nanophotonic Compressive iMaging: On-chip Compressive Lensless,*	

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

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

2005–2008	AFRL	*Multisensor Registration via Mulsticale Geometric Analysis* (co-PI)	
2004–2007	NSF	*Multiscale Geometric Analysis for Higher-Dimensional Signal Processing*	
2004–2007	NSF	*Multiscale Sensor Network Architecture for Distributed Data Processing*	
2004-2006	Hewlett Foundation	*Connexions – Sharing Knowledge and Building Communities*	
2004–2007	AFOSR	*Multiscale Analysis, Modeling, and Processing of High-Dimensional Geometric Data*	
2004	NSF	*WAMA 2004: Wavelets And Multifractal Analysis Workshop*	
2003–2006	NSF	*Safari: Scalable Ad Hoc Networking and Services*	(co-PI)
2002-2004	DARPA	*Integrated Sensing and Processing in Missile Systems* (with Raytheon)	
2002–2004	Hewlett Foundation	*Connexions – Education for a Networked World*	
1999–2004	TI	*Texas Instruments Leadership University Program*	(co-PI)
2002–2004	ONR	*Coherent Multiscale Statistical Modeling using Complex Wavelets*	
2001–2004	DOE	*INCITE: Edge-based Traffic Processing and Service Inference for High-Performance Networks*	
2001–2004	NSF	*Internet Control and Inference from the Edge*	(co-PI)
2000–2004	DARPA	*Multiscale Traffic Processing Techniques for Network Inference and Control*	
2001–2003	AFOSR	*Multiscale Statistical Models for Signal and Image Processing*	
1999–2001	Nokia	*Development of a High-Speed Wireless LAN*	(co-PI)
1999-2001	Texas	*High-Speed Wireless Local Area Network*	(co-PI)
1999-2002	NSF	*Wireless Technology: Seamless Multitier Wireless Networks for Multimedia Applications*	(co-PI)
1999–2002	NSF	*Multiscale Signal and Image Processing using Singularity Grammars*	
1999–2001	ONR	*Model-based Multiscale Signal and Image Processing*	
1999	NSF	*Acquisition of a High Performance Computer System for the Center for Computational Geophysics*	(co-PI)
1998–2000		*Rice Consortium for Computational Seismic Interpretation* Sponsors: Amerada-Hess, Arco, Conoco, Elf Aquitaine, Halliburton, Mobil, Schlumberger	
1998–2001	EPA	*Development of a New Gas Sensing System based on Terahertz Time-Domain Spectroscopy*	(co-PI)
1997–2000	DARPA	*Wavelet-based Detection Algorithms for ATD/R*	(co-PI)
1996	NSF	*CISE Research Instrumentation: A Medium Scale, Tightly Coupled, Shared Memory Multiprocessor*	(co-PI)
1995–1998	ONR	*Operator-Based Approaches for Matching Signal Processing Tools to Data*	(Young Investigator Award)
1994–2000	NSF	*Signal Analysis and Processing in Matched Coordinate Systems*	

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

ACTING

2024 *Little Lorraine* Role: Hearse Driver, Director: Andy Hines, Producers: Wango Films, Topsail Entertainment

STUDENTS

Postdoc: Mitch Roddenberry (PhD from Rice)

PhD students: Gabriel Diaz (Fulbright Scholar), Johaun Hatchett (GEM Fellow), Lucy Liu (KKI Fellow) Minh Tam Nguyen, Thomas Walker

Postdoc alums:
Toros Arikan (Asst. Prof., U. Notre Dame), 2024–2025
Mel White (Naval Research Lab), 2022–2025
Vishwanath Saragadam (Asst. Prof., UC-Riverside), 2021–2023
Yehuda Dar (Asst. Prof., Ben-Gurion University, Israel), 2020-2022
Blake Mason (Amazon Research), 2021–2022
Fernando Gama (Morgan Stanley), 2021–2022
Hamid Javadi (Google), 2020–2022
Gautam Dasarathy (Assoc. Prof., Arizona State University, NSF CAREER Award), 2016–2018
Salman Asif (Assoc. Prof., UC-Riverside, NSF CAREER Award) 2014–2016
Ankit Patel (Asst. Prof., Baylor College of Medicine) 2013–2015
Phillip Grimaldi (Research Scientist at Khan Academy) 2013–2015
Eric Chi (Assoc. Prof., University of Minnesota, NSF CAREER Award) 2013–2015
Mohammad Golbabaee (Prof., University of Bristol) 2013–2015
Divyanshu Vats (Two Sigma) 2012–2014
Tom Goldstein (Volpi-Cupal Prof., University of Maryland, Sloan Fellow, DARPA Young Faculty Award, SIAM DiPrima Prize, ICLR Best Paper) 2012–2014
Jianing Shi (Varian Medical Systems) 2011–2013
Christoph Studer (Prof., ETH-Zurich & Cornell, NSF CAREER Award) 2011–2013
Aswin Sankaranarayanan (Prof., CMU, NSF CAREER Award) 2009–2012
Arian Maleki (Assoc. 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 (Julian Hightower Chair, Georgia Institute of Technology, NSF CAREER Award, McDonnell Foundation 21st Century Science Initiative Scholar 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 (Prof., Université 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 (Manager R&D Observations and Data Technology at Royal Netherlands Meteorological Institute - KNMI) 1997–1999
Jan Odegard (Executive Director, K2I, Rice) 1996–1997
Robert Nowak (Grace Wahba 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 Gonçalvès (Director de Recherche, Ecole Normale Supérieure, Lyon, France) 1994–1996

PhD alums:

Hossein Babaei (2025, now at Ground Truth Analytics)
Shashank Sonkar (2025, now Asst. Prof. at University of Central Florida)
Imtiaz Humayun (2025, now Research Scientist at Google Research)
Sina Alemohammad (2025, now postdoc at UT-Austin)
Paul Mayer (2025, now at BASSBOSS)
Lorenzo Luzi (2024, NSF Graduate Fellow, now Asst. Teaching Prof. at Rice D2K Lab)
Jack Wang (2023, D2K, KKI Fellow, now at Adobe Research)
Daniel LeJeune (2022, D2K Fellow, now postdoc at Stanford University)
Jasper Tan (2022, now at GLASS imaging)
CJ Barberan (2022, NDSEG, NSF, GEM, Intel Foundation Fellow, now at MSR)
Pavan Kota (2022, NIH NLM Fellow, now Activate Fellow and Founder at Anvil Diagnostics)
Randall Balestriero (2021, KKI Fellow, postdoc at NYU/Meta, now Asst. Prof. at Brown)
Tan Minh Nguyen (2020, NSF IGERT, NSF Fellow, CRA Computing Innovation Fellow, UCLA, now Asst. Prof. at NUS, Singapore)
Christopher Metzler (2018, postdoc at Stanford University, NDSEG, NSF, Intelligence Community Postdoc, and NASA Texas Space Grant Consortium Fellow, now Asst. Prof. of Computer Science at U. Maryland, NSF CAREER Award, AFOSR Young Investigator Award, ARO Young Investigator Award)
Ali Mousavi (2018, Schlumberger Fellow, Google AI Residency Program, now at MSR)
Amirali Aghazadeh (2017, Hershel Rich Invention Award, postdoc at Stanford and UC-Berkeley, now Asst. Prof. at Georgia Tech)
Andrew Lan (2016, postdoc at Princeton University and OpenStax, now Assoc. 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, NSF CAREER Award, Sloan Fellow, CIFAR Global Scholar)

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 Assoc. Prof. at NYU, NSF CISE CRII Award, NSF CAREER Award (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, postdoc at Whitehead Institute, MIT, now at Suki)
Mark Davenport, (2010, Hershel Rich Invention Award, Budd Award for best engineering thesis, NSF Math Sciences postdoc fellow at Stanford, now Prof. at Georgia Tech, PECASE, NSF CAREER Award, AFOSR YIP Award, Sloan Fellow, Rice Outstanding Young Engineering Alumnus)
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 Tesla)
Raymond Wagner (2007, now at NASA Johnson Space Center)
Michael Wakin (2006, IEEE Fellow, NSF Graduate Fellow, Hershel Rich Invention Award NSF Math Sciences postdoc fellow at Caltech, Asst. Prof. at U. Michigan, now Prof. at Colorado School of Mines, NSF CAREER Award, DARPA Young Faculty Award, IEEE Fellow)
Vinay Ribeiro (2005, Assoc. Prof. at IIT-Delhi, now Prof. at IIT-Bombay)
Nadeem Ahmed (2004, now VP at AxilPartners)
Justin Romberg (2003, now Schlumberger Prof. at Georgia Tech, IEEE Kilby Medal, Packard Fellow, PECASE, ONR YIP, Rice Outstanding Young Engineering Alumnus, IEEE Fellow)
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 VP Research and Fellow at Broadcom)
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, Westminster College Adjunct Faculty of the Year Award)

MS alums:

Josue Casco-Rodriguez (2025, GEM Fellow, now PhD student at BCM)
Indu Manickam (2019, now at Sandia National Laboratories)
Ryan Burmeister (2018, now in the US Navy)
Dante Soares (2014, now at OpenStax)
Stephen Schnelle (2011, NSF and NDSEG Graduate Fellow, now at Northrop-Grumman)
Sriram Nagaraj (2011, now at Federal Reserve Bank of Atlanta)
Manjari Narayan (2011, Google Anita Borg Scholarship, now Postdoc at Stanford)
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:

Julian Cooper (2010, PhD from MIT, postdoc at UIUC, now Asst. Prof. at U. Wisconsin)
Venkat Chandrasekaran (2005, PhD from MIT, postdoc at UC-Berkeley,

now Prof. at Caltech, NSF CAREER Award, Jin-Au Kong Dissertation Prize for best EE PhD thesis at MIT, Young Researcher Prize from the Mathematical Optimization Society)
Laura Balzano (2002, PhD from U. Wisconsin, now Assoc. Prof. at U. Michigan)
Shannon Hughes (1999, PhD from Princeton, now Asst. Prof. at UC-Boulder)
Maya Gupta (1997, PhD from Stanford, Assoc. Prof. at U. Washington, NSF Graduate Fellow, ONR Young Investigator Award, PECASE Award, now at Google)

External theses: Matteo Gamba (KTH, Sweden), 2025
Marwa El Halabi (EPFL, Switzerland), 2018
Nicolas Ducros (University of Lyon, France), 2017
Suman Maji (University of Bordeaux, France), 2013
Graeme Pope (ETH, Switzerland), 2013
Yaser Eftekhari (Carleton, Canada), 2012
Mohammad Golbabaee (EPFL, Switzerland), 2012
Ali Hormati (EPFL, Switzerland), 2010
Vladan Velisavljevic (EPFL, Switzerland), 2005
Felix Friedrich (Technical Universistat Munchen, Germany), 2005
Rosa Figueras Ventura (EPFL, Switzerland), 2005
James Carson (Baylor College of Medicine), 2004
Antoine Roueff (Ecole Nationale Supérieure d'Ingénieurs Electriciens, Grenoble), 2003
Pier Luigi Dragotti (EPFL, Switzerland), 2002
Minh Do (EPFL, Switzerland), 2001
Pierre Chenais (ENS-Lyon, France), 2001
Rutger van Spaendonck (Delft University of Technology, Netherlands), 2001
Eric Chassande-Motin (ENS-Lyon, France), 2000
Philippe Steeghs (Delft University of Technology, Netherlands), 1997
Dominique Devedeux (Université de Technologie de Compiégne, France), 1996

ACTIVITIES OUTSIDE RICE UNIVERSITY

Editorial Board: *Applied and Computational Harmonic Analysis* (1999–present)
SIAM Journal on Imaging Sciences (2019–present)
IEEE Journal on Selected Areas in Information Theory (2019–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:

AMS Special Session on *Spline Operators: The Mathematics of Deep Neural Networks*, Joint Mathematics Meeting, 2026
Learning @ Scale *Fourth Annual Workshop on A/B Testing and Platform-Enabled Learning Research*, 2023
NeurIPS Workshop on *Learning-Based Solutions for Inverse Problems: Opportunities and Challenges*, 2023
AIED Workshop on *The Future of AI-augmented Human Tutoring in Math*, 2023
Learning @ Scale *Third Annual Workshop on A/B Testing and Platform-Enabled Learning Research*, 2022
Conference on *Interpretability, Safety, and Security in AI*, Turing Institute, 2021
Workshop on *Theory of Overparameterized Machine Learning* (TOPML), 2021
NeurIPS Workshop on *Workshop on Deep Learning and Inverse Problems*, 2020
AIED Workshop on *Intelligent Textbooks (iTexbooks)*, 2020, 2021, 2022
ICLR Workshop on *Integration of Deep Neural Models and Differential Equations*, 2020
NeurIPS Workshop on *Solving Inverse Problems with Deep Networks*, 2019
KDD Workshop on *Deep Learning for Education (DL4Ed)*, 2019
AIED Workshop on *Intelligent Textbooks* (InTex), 2020
NIPS Workshops on *Integration of Deep Learning Theories & Machine Learning for Geophysical and Geochemical Signals*, 2018
SIAM Imaging Science Workshop on *Computational and Compressive Imaging Technology and Applications*, 2016, 2018, 2020
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 Eduction 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), 2016–2019
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:
The Academy of Medicine, Engineering and Science of Texas (TAMEST), 2022–present
IEEE James H. Mulligan, Jr. Education Medal Committee, 2020–2022
IEEE Richard W. Hamming Medal Committee, 2018–2020
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 MacDonald Outstanding Teaching Award, 2004
Sigma Xi Scientific Honor Society

Gov't panels:
NSF Blue Ribbon Panel (topic CUI), 2023
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

2018–2022	Faculty Search Committee, ECE
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 378	Machine Learning: Concepts and Techniques (developed)
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, Education Data Science, Deep Thinking
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/vLVHZP

2020 on Seeing Around Corners: *Science, IEEE Spectrum, The Times of London, The Telegraph, MSN.com*

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), Clarin (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)

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*

2003–2012 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, Edutopia (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

PRESENTATIONS

Keynote and Plenary Lectures

2025 "The Geometry of Deep Learning," *Topology, Algebra, and Geometry in Data Science Workshop*, UCSD, December 2025

"The Geometry of Deep Learning," *Ewing Lecture in Computational Science*, Texas A&M University, November 2025

"The Geometry of Deep Learning," *Dow Distinguished Lecture*, University of Michigan, October 2025

"OER Meets AI," CORES 2025 Symposium, Stanford, May 2025

"Deep Network Grokking, Explained," *Conference on Parsimony and Learning* (CPAL), Stanford, March 2025

"The Future is Open," *Advance Open Ed Speaker Series*, University of Manitoba, March 2025

"Data-Driven Equity: R&D Platforms for Math Learning," *SXSW EDU*, Austin, March 2025

2024 "OER in the AI Age," *Open Education Conference (OpenEd24)*, Providence, October 2024

"Education: The Future is Open," *Baylor University Educational Technology Showcase*, April 2024

2023 "The Geometry of Deep Learning," *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, June 2023

"Going off the Deep End with Deep Learning," *International Conference on Computing, Networking, and Communications* (ICNC), February 2023

"The Mathematics of Deep Learning," **AMS Josiah Willard Gibbs Lecture**, *Joint Mathematics Meeting*, January 2023

2022 "Opening the Data while Releasing None of It," *Learner Data Institute Workshop* at the *International Conference on Educational Data Mining* (EDM), July 2022

"A Signal Processing Perspective on Deep Learning," *SEG Research Workshop on Data Analytics and Machine Learning for Exploration and Production*, February 2022

2021 "Deep Network Spline Geometry," *Topology, Algebra, and Geometry in Computer Vision (TAG-CV) Workshop* at the *International Conference on Computer Vision* (ICCV), October 2021

"Mad Max: Max Affine Spline Insights on Deep Learning," *C3.AI Digital Transformation Institute*, March 2021

2020 "Mad Max: Max Affine Spline Insights on Deep Learning," *DeepMath Workshop*, New York, November 2020

"Going Off the Deep End with Deep Learning," *3rd Annual Meeting of the SIAM Texas-Louisiana Section*, October 2020

"Mad Max: Max Affine Spline Insights on Deep Learning," *Advanced Communication Center (ACC) Workshop*, Tel-Aviv University, Israel, March 2020

2019 "Mad Max: Max Affine Spline Insights on Deep Learning," *Advances in Data Science Theory, Methods, and Computation*, Texas A&M University, September 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 (1.1 million views)

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

2025 Texas Academy of Medicine, Engineering, Science, and Technology (TAMEST) Annual Meeting, DOD Basic Research Forum, Electrical and Computer Engineering Department Heads Association, Texas A&M TAMIDS, HackRice 15, University of Regina, University of Maryland (BRIN)

2022 University of Washington, University of Maryland Norbert Wiener Center, University of Texas at Austin

2021 Yale University, UC-Riverside ECE Distinguished Colloquium, Machine Learning in Solid Earth Geoscience lecture series, CVPR Precognition Workshop, Oberwolfach Program on Computation and Learning in High Dimensions, Harvard

2020 SPE-GCS Data Science Convention, Harvard University, MINDS, Stanford University, Keck Center

2019 Arizona State University; Alan Turing Institute; Simons Institute at UC-Berkeley; US Congress AI Caucus; Universidad Carlos III de Madrid

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; NLII 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

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Highlight Paper (top 10% of accepted papers, top 2.5% of submitted papers)

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Z. Wang, W. Nie, Z. Qiao, C. Xiao, R. G. Baraniuk, and A. Anandkumar, "Retrieval-based Controllable Molecule Generation," *International Conference on Learning Representations* (ICLR), Kigali, Rwanda, May 2023.
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Z. Wang, A. Lan, and R. G. Baraniuk, "Math Word Problem Generation with Mathematical Consistency and Problem Context Constraints," *Conference on Empirical Methods in Natural Language Processing* (EMNLP), November 2021.

V. K. Chaudhri, M. Boggess, H. L. Aung, D. Basu Mallick, A. C. Waters, and R. G. Baraniuk, "Bootstrapping Ontology Graphs," *Automated Knowledge Base Construction*, October 2021.

V. Saragadam, A. Dave, R. G. Baraniuk, and A. Veeraraghavan "Thermal Image Processing via Physics-Inspired Deep Networks," *Learning for Computational Imaging Workshop at ICCV*, (selected for oral presentation), October 2021.

Z. Wang, K. Manning, D. B. Mallick, and R. G. Baraniuk, "Towards Blooms Taxonomy Classification Without Labels," *International Conference on Artificial Intelligence in Education* (AIED), June 2021

S. Alemohammad, H. Babaei, R. Balestriero, M. Cheung, A. I., Humayun, D. LeJeune, N. Liu, L. Luzi, J. Tan, Z. Wang, and R. G. Baraniuk, "Wearing a Mask: Compressed Representations of Variable-Length Sequences using Recurrent Neural Tangent Kernels" *IEEE International Conference on Acoustics, Speech and Signal Processing – ICASSP'21*, June 2021.

V. K. Chaudhri, M. Boggess, H. L. Aung, D. B. Mallick, A. C. Waters, and Richard G. Baraniuk, "A Case Study in Bootstrapping Ontology Graphs from Textbooks," *Automated Knowledge Base Construction*, 2021.

V. Saragadam, M. De Zeeuw, A. Sankaranarayanan, R. G. Baraniuk, and A. Veeraraghavan, "SASSI — Super-Pixellated Adaptive Spatio-Spectral Imaging," *IEEE International Conference on Computational Photography* (ICCP), April 2021.

S. Alemohammad, R. Balestriero, J. Wang, and R. G. Baraniuk, "The Recurrent Neural Tangent Kernel," *International Conference on Learning Representations* (ICLR), April 2021.

T. Yao, D. LeJeune, H. Javadi, R. G. Baraniuk, and G. A. Allen, "Minipatch Learning as Implicit Ridge-Like Regularization," *IEEE International Conference on Big Data and Smart Computing*, January 2021.

S. Sonkar, A. Waters, and R. G. Baraniuk, "Attention Word Embedding," *International Conference on Computational Linguistics* (COLING), December 2020.

R. Balestriero, S. Paris, and R. G. Baraniuk, "Analytical Probability Distributions and EM-Learning for Deep Generative Networks," *Neural Information Processing Systems* (NeurIPS), December 2020.

T. Nguyen, B. Wang, A. Bertozzi, S. Osher, and R. G. Baraniuk, "MomentumRNN: Integrating Momentum into Recurrent Neural Networks," *Neural Information Processing Systems* (NeurIPS), December 2020.

Y. Dar, P. Mayer, L. Luzi, and R. G. Baraniuk, "Subspace Fitting Meets Regression: The Effects of Supervision and Orthonormality Constraints on Double Descent of Generalization Error," *International Conference on Machine Learning* (ICML), July 2020.

B. Coleman, R. G. Baraniuk, and A. Shrivastava, "Sub-linear Memory Sketches for Near Neighbor Search on Streaming Data with RACE," *International Conference on Machine Learning* (ICML), July 2020.

S. Sonkar, A. Lan, A. Waters, and R. G. Baraniuk, "qDKT: Question-centric Deep Knowledge Tracing," *International Conference on Educational Data Mining – EDM*, July 2020.

J. Wang, Y. Gu, A. Lan, and R. G. Baraniuk, "VarFA: A Variational Factor Analysis Framework For Efficient Bayesian Learning Analytics," *International Conference on Educational Data Mining – EDM*, July 2020.

J. Tan, S. Khan, V. Boominathan, J. Byrne, R. G. Baraniuk, K. Mitra, and A. Veeraraghavan, "CAnOPIC: Pre-Digital Privacy-Enhancing Encodings for Computer Vision," *IEEE International Conference on Multimedia and Expo* (ICME), London, UK, July 2020 (oral presentation).

D. LeJeune, H. Javadi, and R. G. Baraniuk, "The Implicit Regularization of Ordinary Least Squares Ensembles," *International Conference on Artificial Intelligence and Statistics* (AISTATS), Palermo, Italy, June 2020.

D. LeJeune, G. Dasarathy, and R. G. Baraniuk, "Thresholding Graph Bandits with GrAPL," *International Conference on Artificial Intelligence and Statistics* (AISTATS), Palermo, Italy, June 2020.

H. You, C. Li, P. Xu, Y. Fu, Y. Wang, R. G. Baraniuk, and Y. Lin, "Drawing Early-Bird Tickets: Toward More Efficient Training of Deep Networks," *International Conference on Learning Representations* (ICLR), Addis Ababa, April 2020. (Spotlight paper)

R. Balestriero, R. Cosentino, B. Aazhang, and R. G. Baraniuk, "The Geometry of Deep Networks: Power Diagram Subdivision," *Neural Information Processing Systems* (NeurIPS), Vancouver, December 2019.

I. Manickam, A. S. Lan, G. Dasarathy, and R. G. Baraniuk, "IdeoTrace: A Framework for Ideology Tracing with a Case Study on the 2016 U.S. Presidential Election," *IEEE/ACM International Conference on Social Networks Analysis and Mining* (ASONAM), Vancouver, August 2019.

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. Balestriero 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. Balestriero, 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. Balestriero 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, Y. Lin, and R. G. Baraniuk, "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. Abnousi, 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. Balestriero 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.

R. Cosentino, R. Balestriero, 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 Tradeoff," *Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, October 2017.

T. Nguyen, W. Liu, F. Sinz, R. G. Baraniuk, A. S. Tolias, 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.

C. Metzler, M. Sharma, S. Nagesh, R. G. Baraniuk, O. Cossairt, and A. Veeraraghavan, "Coherent Inverse Scattering via Transmission Matrices: Efficient Phase Retrieval Algorithms and a Public Dataset," *IEEE International Conference on Computational Photography*, Stanford, June 2017.
Best Paper Award runner-up

G. Dasarathy, P. Shah, and R. G Baraniuk, "Sketched Covariance Testing: A Compression-Statistics Tradeoff," *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)*, Washingon, 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.

A. Taeb, A. Maleki, C. Studer, and R. G. Baraniuk, "Maximin Analysis of Message Passing for Recovering Group Sparse Signals," *Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Lausanne, Switzerland, July 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)*, Coolum, Australia, July 2011.

J. P. Slavinsky, J. Laska, and R. G. Baraniuk, "The Compressive Mutliplexer 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.

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