Christopher A. Metzler

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Education

Since 02/19 **Postdoctoral Researcher**, *Stanford University*, Electrical Engineering, Stanford, CA.
Advisor: Gordon Wetzstein

01/15–12/18 **Doctor of Philosophy**, *Rice University*, Electrical and Computer Engineering, Houston, TX.
4.0 GPA
Thesis: Data-Driven Computational Imaging with Applications to Imaging Through and Around Obstacles
Advisors: Richard Baraniuk and Ashok Veeraraghavan

08/13–12/14 **Master of Science**, *Rice University*, Electrical and Computer Engineering, Houston, TX.
Thesis: Denoising-based Approximate Message Passing for Compressed Sensing
Advisor: Richard Baraniuk

08/9–05/13 **Bachelor of Science**, *Rice University*, Electrical and Computer Engineering, Houston, TX.
3.89 GPA
Magna Cumme Laude

Honors and Awards

2018 **Annual Research Publication Awards Dinner Winning Paper**, *Naval Research Laboratory*.

2017 **Runner-up Best Paper**, *International Conference on Computational Photography*.

2015 **Top 10% Paper**, *International Conference on Image Processing*.

2018 **NASA Texas Space Grant Consortium Fellow**.

2017 **Ken Kennedy Institute High Performance Computing Fellow**.

2015 **NSF Graduate Research Fellow**.

2014 **NDSEG Fellow**.

2013 **Texas Instruments Fellow**.

2009 **National Merit Scholar Finalist**.

Experience

06/17-08/17 **Naval Research Laboratory**, *Graduate Research Intern in Applied Optics Branch*, Washington, DC.

05/16-07/16 **Ball Aerospace**, *RF Engineering Intern in Mission Systems Group*, Broomfield, CO.

05/15-07/15 **Ball Aerospace**, *RF Engineering Intern in Mission Systems Group*, Broomfield, CO.

05/14-08/14 **ViaSat**, *Engineering Intern*, Carlsbad, CA.

05/13-08/13 **National Instruments**, *Hardware Engineering Intern*, Austin, TX.

05/12-08/12 **Technical University of Braunschweig**, *Undergraduate Research Intern*, Braunschweig, Germany.

Talks

2018 **Talk**, *Deep Learning for Seeing Around Corners*, Rice Machine Learning Lunch.

2018 **Talk**, *prDeep: Robust Phase Retreival with a Flexible Deep Network*, ICML.

2018 **Invited Talk**, *Imaging Through Scattering Media Using Phase Retrieval*, ICA/LVA Special Session on Phase Retrieval and Applications.

2018 **Talk**, *Unsupervised Learning with Stein's Unbiased Risk Estimator: A Practical Approach to Universal Compressive Sensing*, SIAM IS-18 Minisymposium on Computational and Compressive Imaging Technologies and Applications.

2018 **Invited Talk**, *Data-Driven Computational Imaging: Improved Imaging Through Scattering Media with Visible Light*, Stanford Center for Imaging Systems and Engineering.

2018 **Invited Talk**, *Phase Retrieval: Fast, Robust, and Data-driven Algorithms for Computational Imaging*, SPIE Photonics West Quantitative Phase Imaging Workshop IV.

2017 **Talk**, *Unrolling: A Principled Method to Develop Deep Neural Networks*, Rice Geo-Mathematical Imaging Group Project Review.

2017 **Talk**, *Coherent Inverse Scattering via Transmission Matrices: Efficient Phase Retrieval Algorithms and a Public Dataset*, ICCP.

2016 **Talk**, *BM3D-prGAMP: Compressive Phase Retrieval Based on BM3D Denoising*, ICME MM-SPARSE Workshop.

2015 **Invited Talk**, *Connecting Bayesian and Denoising-based Compressed Sensing*, Asilomar.

2015 **Talk**, *BM3D-AMP: A New Image Recovery Algorithm Based on BM3D Denoising*, ICIP.

Publications

Inverse Scattering via Transmission Matrices Under Broadband Illumination: A Fast Phase Retrieval Algorithm and a Public Dataset, *Metzler, C.A., Sharma, M.K., Nagesh, S., Baraniuk, R.G., Cossairt, O. and Veeraraghavan, A.*, Under review.

Deep-inverse correlography: Towards real-time high-resolution non-line-of-sight imaging, *Metzler, C., Heide, F., Rangarajan, P., Viswanath, A., Baraniuk, R., Veeraraghavan, A.*, Under review.

Unsupervised learning with Stein's unbiased risk estimator, *Metzler, C., Mousavi, A., Heckel, R., and Baraniuk, R.*, Accepted, BASP Workshop, 2019.

Imaging through extreme scattering in extended dynamic media, *Kanaev, A., Watnik, A., Gardner, D., Metzler, C., Judd, K., Lebow, P., Novak, K., and Lindle, J.*, Optics Letters, 2018.

prDeep: Robust phase retrieval with a flexible deep network, *Metzler, C., Schniter, P., Veeraraghavan, A., and Baraniuk, R.*, International Conference on Machine Learning (ICML), 2018.

An expectation-maximization approach to tuning generalized vector approximate message passing, *Metzler, C., Schniter, P., and Baraniuk, R.*, ICA/LVA Special Session on Advances in Phase Retrieval and Applications, 2018.

Learned D-AMP: Principled neural-network-based compressive image recovery, *Metzler, C., Mousavi, A., and Baraniuk, R.*, Neural Information Processing Systems (NIPS), 2017.

Coherent inverse scattering via transmission matrices: Efficient phase retrieval algorithms and a public dataset, *Metzler, C.A., Sharma, M.K., Nagesh, S., Baraniuk, R.G., Cossairt, O. and Veeraraghavan, A.*, IEEE International Conference on Computational Photography (ICCP), 2017.

BM3D-prGAMP: Compressive phase retrieval based on BM3D denoising, *Metzler, C., Maleki, A., and Baraniuk, R.*, IEEE International Conference on Image Processing (ICIP), 2016.

From denoising to compressed sensing, *Metzler, C., Maleki, A., and Baraniuk, R.*, IEEE Transactions on Information Theory, 2016.

Optimal recovery from compressive measurements via denoising-based approximate message passing, *Metzler, C., Maleki, A., and Baraniuk, R.*, IEEE International Conference on Sampling Theory and Applications (SampTA), 2015.

Iterative reconstruction from limited angle, limited view projections for cryo-electron tomography, *Wood, S., Fontenla, E., Metzler, C., Chiu, W., Baraniuk, R.*, IEEE 49th Asilomar Conference on Signals, Systems and Computers, 2015.

Dynamic model generation for application of compressed sensing to cryo-electron tomography reconstruction, *Wood, S., Fontenla, E., Metzler, C., Chiu, W., Baraniuk, R.*, IEEE Signal Processing and Signal Processing Education Workshop (SP/SPE), 2015.

BM3D-AMP: A new image recovery algorithm based on BM3D denoising, *Metzler, C., Maleki, A., and Baraniuk, R.*, IEEE International Conference on Image Processing (ICIP), 2015.

Teaching Experience

Fall 2017 **Grader**, *Introduction to Deep Learning*, Rice University.

Spring 2016 **Grader**, *Fundamentals of Electrical Engineering II*, Rice University.

Fall 2015 **Grader**, *Signals and Systems*, Rice University.

Spring 2015 **Teaching Assistant**, *Fundamentals of Electrical Engineering II*, Rice University.

Fall 2014 **Grader**, *Signals and Systems*, Rice University.

Fall 2013 **Teaching Assistant**, *Advanced VLSI*, Rice University.

Fall 2011 **Course Assistant**, *Signals and Systems*, Rice University.

Spring 2011 **Course Assistant**, *Fundamentals of Electrical Engineering II*, Rice University.

Fall 2010 **Course Assistant**, *Fundamentals of Electrical Engineering I*, Rice University.

Professional Service

Journal Reviewer, *IEEE Transactions on Image Processing, Information Theory, Signal Processing, and Computational Imaging; IEEE Signal Processing Letters; IEEE Sensors Journal; SIAM Journal on Imaging Sciences; Elsevier Digital Signal Processing, Elsevier Signal Processing: Image Communication, and Elsevier Journal of Visual Communication and Image Representation; and Springer Journal of Circuits, Systems, and Signal Processing.*

Conference Reviewer, *CVPR and ICML.*

08/17-05/18 **Professional Development Chair**, *Rice ECE Graduate Student Association.*

08/16-05/17 **Social Chair**, *Rice ECE Graduate Student Association.*

08/14-05/15 **Community Service Committee Member**, *Rice Graduate Student Association.*

08/12-05/13 **Vice President**, *Rice IEEE.*

08/11-05/12 **Treasurer**, *Rice IEEE.*

08/09-05/13 **Member**, *Rice Society of Automotive Engineers.*

Technical Skills

Machine Learning, *TensorFlow, PyTorch, and MatConvNet.*

General Programming, *Matlab, Python, C, C++, and R.*

FPGA/HDL, *System Generator, VHDL, Verilog, Labview FPGA, and AutoESL.*

Lab, *RF measurements in anechoic chambers and general circuit assembly and test experience.*