Chinmay Hegde

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	Coover Hall 3128	**Email**	chinmay@iastate.edu
	Ames, IA 50010	**Website**	http://home.engineering.iastate.edu/~chinmay/

Research Interests

Data Analytics
Machine Learning
Signal Processing
Design and Analysis of Algorithms

Education

2012   Ph.D. in Electrical and Computer Engineering, Rice University

Advisor: Richard G. Baraniuk
Thesis: "Nonlinear Signal Models: Geometry, Analysis, and Algorithms"
Winner of 2013 Ralph Budd Award for Best Thesis in School of Engineering

2010   M.S. in Electrical and Computer Engineering, Rice University

2006   B.Tech. in Electrical Engineering, Indian Institute of Technology Madras

Positions

2015-	Iowa State University, ECpE Department	Assistant Professor
2017-20	Iowa State University, College of Engineering	Black & Veatch Faculty Fellow
2012-15	Massachusetts Institute of Technology, CSAIL	Postdoctoral Associate
2014-15	Massachusetts Institute of Technology, EECS Department	Instructor
2011	Mitsubishi Electric Research Labs (MERL)	Summer Intern
2006-12	Rice University	Graduate Research Assistant
2005	Ittiam Systems Pvt. Ltd.	Summer Intern

Honors and Awards

2018	NSF CAREER Award
2017	Black & Veatch Building a World of Difference Faculty Fellowship
2017	Best Poster Award, Midwest Machine Learning Symposium (MMLS)
2016	NSF CISE Research Initiation Initiative (CRII) Award

2016	Warren B. Boast Undergraduate Teaching Award
2015	Best Paper Award, International Conference on Machine Learning (ICML)
2013	Ralph Budd Award for Best Thesis in the School of Engineering, Rice University
2010	Robert L. Patten Award for university service, Rice University
2009	Best Student Paper Award, SPARS Workshop
2006-12	Rice University Fellowship
2002-03	National Board of Higher Mathematics (NBHM) Fellowship, India
2002	Gold Medal, Indian National Physics Olympiad
2001,02	Certificate of Distinction, Indian National Mathematics Olympiad
2001	Certificate of Distinction, Indian National Astronomy Olympiad
2000-02	Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship, India
2000	National Talent Search Exam (NTSE) Scholarship, India

Funding

PI, "CAREER: Advances in Graph Learning and Inference", National Science Foundation (NSF), February 2018-January 2023, $420,000 (sole PI).

co-PI, "CIF: Small: Structured High-dimensional Data Recovery from Phaseless Measurements", National Science Foundation (NSF), July 2018-June 2021, $499,071. (PI: Namrata Vaswani, CH share: 50%).

co-PI, "ATD: Efficient and Stable Algorithms for Non-Euclidean Regression in Discrete Geometries", National Science Foundation (NSF), October 2018-September 2021, $200,000. (PI: Eric Weber, CH share: 25%).

PI, "Faculty Fellowship", Black & Veatch Foundation, September 2017-May 2020, $22,500.

Co-PI, "Modeling Multi-dimensional Risk in Real-World Drivers with Diabetes", University of Nebraska Medical Center (sub-award of Toyota Research grant), $198,664. (PI: Anuj Sharma, CH share: summer support).

Co-PI, "Prediction of Driver Safety in Advancing Age: Real-World Recorders", University of Nebraska Medical Center (sub-award of NIH grant), $76,122. (PI: Anuj Sharma, CH share: summer support).

PI, "CRII: CIF: Towards Linear-Time Computation of Structured Data Representations", National Science Foundation (NSF), April 2016-March 2018, $173,282 (sole PI).

Senior Personnel, "PFI: BIC: A Smart Service System for Traffic Incident Management Enabled by Large-data Innovations", National Science Foundation (NSF), September 2016-August 2019, $1,000,000. (PI: Anuj Sharma, CH share: summer support).

PI, "GPU Grant Program", NVIDIA Corporation, $2,500 (equipment).

Publications

Google Scholar metrics (August 2018): 2668 citations, H-index=19, i10-index=24.

Thesis

C. Hegde. *Nonlinear Signal Models: Geometry, Algorithms, and Analysis.* PhD thesis, ECE Department, Rice University, Sept. 2012. ***Ralph Budd Award for Best Thesis in School of Engineering.***

Journal Articles

M. Soltani and C. Hegde. Fast algorithms for demixing signals from nonlinear observations. *IEEE Trans. Sig. Proc.*, 65(16):4209–4222, Aug. 2017.

C. Hegde, A. Sankaranarayanan, W. Yin, and R. Baraniuk. NuMax: A convex approach for learning near-isometric linear embeddings. *IEEE Trans. Sig. Proc.*, 63(22):6109–6121, Nov. 2015.

C. Hegde, P. Indyk, and L. Schmidt. Fast algorithms for structured sparsity. *Bulletin of the EATCS*, 1(117):197–228, Oct. 2015.

C. Hegde, P. Indyk, and L. Schmidt. Approximation algorithms for model-based compressive sensing. *IEEE Trans. Inform. Theory*, 61(9):5129–5147, Sept. 2015.

Y. Li, C. Hegde, A. Sankaranarayanan, R. Baraniuk, and K. Kelly. Compressive image classification via secant projections. *J. Optics*, 17(6), June 2015.

S. Nagaraj, C. Hegde, A. Sankaranarayanan, and R. Baraniuk. Optical flow-based transport for image manifolds. *Appl. Comput. Harmon. Anal.*, 36(2):280–301, March 2014.

C. Hegde and R. Baraniuk. Signal recovery on incoherent manifolds. *IEEE Trans. Inform. Theory*, 58(12):7204–7214, Dec. 2012.

C. Hegde and R. Baraniuk. Sampling and recovery of pulse streams. *IEEE Trans. Sig. Proc.*, 59(4):1505–1517, Apr. 2011.

M. Davenport, C. Hegde, M. Duarte, and R. Baraniuk. Joint manifolds for data fusion. *IEEE Trans. Image Proc.*, 19(10):2580–2594, Oct. 2010.

R. Baraniuk, V. Cevher, M. Duarte, and C. Hegde. Model-based compressive sensing. *IEEE Trans. Inform. Theory*, 56(4):1982–2001, Apr. 2010.

Conference Proceedings

S. Asif and C. Hegde. Phase retrieval for signals in a union of subspaces. In *Proc. IEEE Global Conf. Signal and Image Processing (GlobalSIP)*, Nov. 2018.

P. Chakraborty, C. Hegde, and A. Sharma. Freeway incident detection from cameras: A semi-supervised learning approach. In *Proc. IEEE Int. Conf. Intelligent Transportation Systems (ITSC)*, Nov. 2018.

G. Jagatap, Z. Chen, C. Hegde, and N. Vaswani. Model corrected low rank ptychography. In *Proc. IEEE Conf. Image Proc.*, Sept. 2018.

T. Nguyen, A. Soni, and C. Hegde. On learning sparsely used dictionaries from incomplete samples. In *Proc. Int. Conf. Machine Learning (ICML)*, Jul. 2018.

T. Nguyen, R. Wong, and C. Hegde. Autoencoders learn generative linear models. In *Proc. ICML Workshop on Theory and Applications of Deep Generative Modeling (TADGM)*, June 2018.

Z. Jiang, A. Balu, C. Hegde, and S. Sarkar. Incremental consensus-based collaborative deep learning. In *Proc. ICML Workshop on Nonconvex Optimization for Machine Learning*, July 2018.

G. Jagatap and C. Hegde. Towards sample-optimal methods for solving random quadratic equations with structure. In *Proc. IEEE Int. Symp. Inform. Theory (ISIT)*, June 2018.

M. Soltani and C. Hegde. Fast low-rank matrix estimation for ill-conditioned matrices. In *Proc. IEEE Int. Symp. Inform. Theory (ISIT)*, June 2018.

V. Shah and C. Hegde. Solving linear inverse problems using gan priors: An algorithm with provable guarantees. In *Proc. IEEE Int. Conf. Acoust., Speech, and Signal Processing (ICASSP)*, Apr. 2018.

Z. Chen, G. Jagatap, S. Nayer, C. Hegde, and N. Vaswani. Low rank fourier ptychography. In *Proc. IEEE Int. Conf. Acoust., Speech, and Signal Processing (ICASSP)*, Apr. 2018.

G. Jagatap, Z. Chen, C. Hegde, and N. Vaswani. Fourier ptychography using structured sparsity. In *Proc. IEEE Int. Conf. Acoust., Speech, and Signal Processing (ICASSP)*, Apr. 2018.

M. Soltani and C. Hegde. Towards provable learning of polynomial neural networks using low-rank matrix estimation. In *Proc. Intl. Conf. Artificial Intelligence and Statistics (AISTATS)*, Apr. 2018.

T. Nguyen, R. Wong, and C. Hegde. A provable approach for double-sparse coding. In *Proc. AAAI Conf. Artificial Intelligence*, Feb. 2018.

G. Jagatap and C. Hegde. Fast sample-efficient algorithms for structured phase retrieval. In *Adv. Neural Inf. Proc. Sys. (NIPS)*, Dec. 2017.

Z. Jiang, A. Balu, C. Hegde, and S. Sarkar. Collaborative deep learning over fixed topology networks. In *Adv. Neural Inf. Proc. Sys. (NIPS)*, Dec. 2017.

A. Balu, T. Nguyen, A. Kokate, C. Hegde, and S. Sarkar. A forward-backward approach for visualizing information flow in deep networks. In *Proc. NIPS Symposium on Interpretability for Machine Learning*, Dec. 2017.

P. Chakraborty, C. Hegde, and A. Sharma. Trend filtering in network time series with applications to traffic incident detection. In *Proc. NIPS Time Series Workshop (TSW)*, Dec. 2017.

M. Cohen, C. Hegde, S. Jegelka, and L. Schmidt. Efficiently optimizing over (non-convex) cones via approximate projections. In *Proc. NIPS Workshop on Optimization for Machine Learning (OPT)*, Dec. 2017.

C. Hubbard and C. Hegde. Parallel computing heuristics for matrix completion. In *Proc. IEEE Global Conf. Signal and Image Processing (GlobalSIP)*, Nov. 2017.

M. Soltani and C. Hegde. Demixing structured superposition signals from periodic and aperiodic nonlinearities. In *Proc. IEEE Global Conf. Signal and Image Processing (GlobalSIP)*, Nov. 2017.

C. Hegde. Learning graph evolutions from cut sketches: Faster algorithms, fewer samples. In *Proc. Asilomar Conf. Sig. Sys. Comput.*, Nov. 2017.

V. Shah, M. Soltani, and C. Hegde. Reconstruction from periodic nonlinearities, with applications to HDR imaging. In *Proc. Asilomar Conf. Sig. Sys. Comput.*, Nov. 2017.

M. Soltani and C. Hegde. Fast algorithms for learning latent variables in graphical models. In *Proc. ACM KDD Workshop on Mining and Learning with Graphs (KDD MLG)*, Aug. 2017.

B. Wang, C. Gan, J. Yang, C. Hegde, and J. Wu. Graph-based multiple-line outage identification in power transmission systems. In *IEEE Power and Engineering Systems General Meeting (PES)*, Jul. 2017.

M. Soltani and C. Hegde. Stable recovery of sparse vectors from random sinusoidal feature maps. In *Proc. IEEE Int. Conf. Acoust., Speech, and Signal Processing (ICASSP)*, Mar. 2017.

C. Hegde, P. Indyk, and L. Schmidt. Fast recovery from a union of subspaces. In *Adv. Neural Inf. Proc. Sys. (NIPS)*, Dec. 2016.

M. Soltani and C. Hegde. Iterative thresholding for demixing structured superpositions in high dimensions. In *Proc. NIPS Workshop on Learning in High Dimensions with Structure (LHDS)*, Dec. 2016.

M. Soltani and C. Hegde. A fast iterative algorithm for demixing sparse signals from nonlinear observations. In *Proc. IEEE Global Conf. Signal and Image Processing (GlobalSIP)*, Dec. 2016.

M. Soltani and C. Hegde. Demixing sparse signals from nonlinear observations. In *Proc. Asilomar Conf. Sig. Sys. Comput.*, Nov. 2016.

C. Hubbard, J. Bavslik, C. Hegde, and C. Hu. Data-driven prognostics of lithium-ion rechargeable battery using bilinear kernel regression. In *Annual Conf. Prognostics and Health Management (PHM)*, Oct. 2016.

C. Hegde, P. Indyk, and L. Schmidt. Nearly linear-time algorithms for graph-structured sparsity. In *Proc. Intl. Joint Conf. Artificial Intelligence (IJCAI)*, Best Paper Awards Track, July 2016.

C. Hegde. A fast algorithm for demixing signals with structured sparsity. In *Proc. Intl. Conf. Sig. Proc. Comm. (SPCOM)*, June 2016.

C. Hegde. Bilevel feature selection in nearly-linear time. In *Proc. Stat. Sig. Proc. (SSP)*, June 2016.

C. Hegde, P. Indyk, and L. Schmidt. A nearly linear-time framework for graph-structured sparsity. In *Proc. Int. Conf. Machine Learning (ICML)*, July 2015. **Best Paper Award.**

J. Acharya, I. Diakonikolas, C. Hegde, J. Li, and L. Schmidt. Fast and near-optimal algorithms for approximating distributions by histograms. In *Proc. Symp. Principles of Database Systems (PODS)*, May 2015.

M. Araya-Polo, C. Hegde, P. Indyk, and L. Schmidt. Greedy strategies for data-adaptive shot selection. In *Proc. Annual EAGE Meeting*, May 2015.

L. Schmidt, C. Hegde, P. Indyk, L. Lu, X. Chi, and D. Hohl. Seismic feature extraction using Steiner tree methods. In *Proc. IEEE Int. Conf. Acoust., Speech, and Signal Processing (ICASSP)*, Apr. 2015.

C. Hegde, P. Indyk, and L. Schmidt. Nearly linear-time model-based compressive sensing. In *Proc. Intl. Colloquium on Automata, Languages, and Programming (ICALP)*, July 2014.

C. Hegde, P. Indyk, and L. Schmidt. A fast approximation algorithm for tree-sparse recovery. In *Proc. IEEE Int. Symp. Inform. Theory (ISIT)*, June 2014.

Y. Li, C. Hegde, and K. Kelly. Object tracking via compressive sensing. In *Proc. Comput. Optical Sensing and Imaging (COSI)*, June 2014.

C. Hegde, A. Sankaranarayanan, and R. Baraniuk. Lie operators for compressive sensing. In *Proc. IEEE Int. Conf. Acoust., Speech, and Signal Processing (ICASSP)*, May 2014.

L. Schmidt, C. Hegde, P. Indyk, J. Kane, L. Lu, and D. Hohl. Automatic fault localization using the Generalized Earth Movers Distance. In *Proc. IEEE Int. Conf. Acoust., Speech, and Signal Processing (ICASSP)*, May 2014.

C. Hegde, P. Indyk, and L. Schmidt. Approximation-tolerant model-based compressive sensing. In *Proc. ACM Symp. Discrete Alg. (SODA)*, Jan. 2014.

E. Grant, C. Hegde, and P. Indyk. Nearly optimal linear embeddings into very low dimensions. In *Proc. IEEE Global Conf. Signal and Image Processing (GlobalSIP)*, Dec. 2013.

C. Hegde, A. Sankaranarayanan, and R. Baraniuk. Learning measurement matrices for redundant dictionaries. In *Proc. Work. Struc. Parc. Rep. Adap. Signaux (SPARS)*, July 2013.

L. Schmidt, C. Hegde, and P. Indyk. The Constrained Earth Movers Distance model, with applications to compressive sensing. In *Proc. Sampling Theory and Appl. (SampTA)*, July 2013.

Y. Li, C. Hegde, R. Baraniuk, and K. Kelly. Compressive classification via secant projections. In *Proc. Comput. Optical Sensing and Imaging (COSI)*, June 2013.

D. Grady, M. Moll, C. Hegde, A. Sankaranarayanan, R. Baraniuk, and L. Kavraki. Multi-robot target verification with reachability constraints. In *Proc. IEEE Int. Symp. on Safety, Security, and Rescue Robotics (SSRR)*, Nov. 2012.

D. Grady, M. Moll, C. Hegde, A. Sankaranarayanan, R. Baraniuk, and L. Kavraki. Multi-objective sensor replanning for a car-like robot. In *Proc. IEEE Int. Symp. on Safety, Security, and Rescue Robotics (SSRR)*, Nov. 2012.

C. Hegde, A. Sankaranarayanan, and R. Baraniuk. Near-isometric linear embeddings of manifolds. In *Proc. Stat. Sig. Proc. (SSP)*, Aug. 2012.

C. Hegde and R. Baraniuk. SPIN: Iterative signal recovery on incoherent manifolds. In *Proc. IEEE Int. Symp. Inform. Theory (ISIT)*, July 2012.

A. Sankaranarayanan, C. Hegde, S. Nagaraj, and R. Baraniuk. Go with the flow: Optical flow-based transport operators for image manifolds. In *Proc. Allerton Conf. on Comm., Contr., and Comp.*, Sept. 2011.

D. Grady, M. Moll, C. Hegde, A. Sankaranarayanan, R. Baraniuk, and L. Kavraki. Look before you leap: Predictive sensing and opportunistic navigation. In *Proc. IROS Workshop on Open Prob. Motion Plan.*, Sept. 2011.

M. Davenport, C. Hegde, M. Duarte, and R. Baraniuk. High-dimensional data fusion via joint manifold learning. In *Proc. AAAI Fall Symp. on Manifold Learning*, Nov. 2010.

C. Hegde and R. Baraniuk. Compressive sensing of a superposition of pulses. In *Proc. IEEE Int. Conf. Acoust., Speech, and Signal Processing (ICASSP)*, March 2010.

S. Schnelle, J. Laska, C. Hegde, M. Duarte, M. Davenport, and R. Baraniuk. Texas hold 'em algorithms for distributed compressive sensing. In *Proc. IEEE Int. Conf. Acoust., Speech, and Signal Processing (ICASSP)*, March 2010.

C. Hegde and R. Baraniuk. Compressive sensing of streams of pulses. In *Proc. Allerton Conf. on Comm., Contr., and Comp.*, Sept. 2009.

V. Cevher, P. Indyk, C. Hegde, and R. Baraniuk. Recovery of clustered sparse signals from compressive measurements. In *Proc. Sampling Theory and Appl. (SampTA)*, May 2009.

C. Hegde, M. Duarte, and V. Cevher. Compressive sensing recovery of spike trains using a structured sparsity model. In *Proc. Work. Struc. Parc. Rep. Adap. Signaux (SPARS)*, Apr. 2009. ***Best Student Paper Award.***

M. Duarte, C. Hegde, V. Cevher, and R. Baraniuk. Recovery of compressible signals from unions of subspaces. In *Proc. IEEE Conf. Inform. Science and Systems (CISS)*, March 2009.

V. Cevher, M. Duarte, C. Hegde, and R. Baraniuk. Sparse signal recovery using Markov Random Fields. In *Adv. Neural Inf. Proc. Sys. (NIPS)*, Dec. 2008.

M. Davenport, C. Hegde, M. Wakin, and R. Baraniuk. Manifold-based approaches for improved classification. In *Proc. NIPS Workshop on Topology Learning*, Dec. 2007.

C. Hegde, M. Davenport, M. Wakin, and R. Baraniuk. Efficient machine learning using random projections. In *Proc. NIPS Workshop on Efficient Machine Learning*, Dec. 2007.

C. Hegde, M. Wakin, and R. Baraniuk. Random projections for manifold learning. In *Adv. Neural Inf. Proc. Sys. (NIPS)*, Dec. 2007.

Under Review

P. Chakraborty, C. Hegde, and A. Sharma. Data-driven traffic incident detection using robust summary statistics. Preprint, Sept. 2018.

T. Nguyen, R. Wong, and C. Hegde. Autoencoders learn generative linear models. Preprint, June 2018.

G. Jagatap and C. Hegde. Learning ReLU networks using alternating minimization. Preprint, June 2018.

Z. Jiang, A. Balu, C. Hegde, and S. Sarkar. Decentralized stochastic momentum gradient descent for multi-agent learning. Preprint, June 2018.

M. Soltani and C. Hegde. Provable algorithms for learning two-layer polynomial neural networks. Preprint, Jan. 2018.

T. Nguyen, R. Wong, and C. Hegde. A provable approach for double-sparse coding. Preprint, available online at https://arxiv.org/abs/1711.03638, Nov. 2017.

M. Soltani and C. Hegde. Fast low-rank matrix estimation without the condition number. Preprint, Dec. 2017.

G. Jagatap and C. Hegde. Sample-efficient algorithms for recovering structured signals from magnitude-only measurements. Available online at http://arxiv.org/abs/1705.06412, Nov. 2017.

Books and Monographs

C. Hegde and A. Kamal. Theoretical foundations of computer engineering. Monograph available online, June 2017.

C. Hegde. Lecture notes on data analytics. Monograph available online, June 2017.

R. Baraniuk, M. Davenport, M. Duarte, and C. Hegde. *An Introduction to Compressive Sensing.* Connexions e-textbook, 2011.

Technical Reports

C. Hubbard and C. Hegde. GPUFish: A parallel computing framework for matrix completion from a few observations. Technical report, Iowa State University, December 2016.

C. Hegde. Bilevel feature selection in nearly-linear time. Preprint, 2016.

C. Hegde, A. Sankaranarayanan, and R. Baraniuk. Learning manifolds in the wild. Preprint, July 2012.

C. Hegde, P. Indyk, and L. Schmidt. A fast adaptive variant of the GW algorithm for the Prize-Collecting Steiner Tree problem. DIMACS Workshop, Dec. 2014.

C. Hegde, O. Tuzel, and F. Porikli. Efficient upsampling of natural images. MERL Technical Report, March 2012.

M. Davenport, C. Hegde, M. Duarte, and R. Baraniuk. A theoretical analysis of joint manifolds. Technical Report TREE0901, Rice University ECE Department, Jan. 2009.

C. Hegde, M. Wakin, and R. Baraniuk. Random projections for manifold learning: Proofs and analysis. Technical Report TREE-0710, Rice Univ., ECE Dept., Dec. 2007.

Patents

O. Tuzel, F. Porikli, and C. Hegde, "Upscaling Natural Images", US Patent No. 8,620,073, December 2013.

Invited Presentations

At ISU

"Unsupervised Neural Network Learning from an Algorithmic Lens", CS Department Seminar, University of Iowa, September 2018.

"Unsupervised Neural Network Learning from an Algorithmic Lens", ECE Graduate Seminar, Carnegie Mellon University, Pittsburgh PA, September 2018.

"Fast Algorithms for Learning Structured Dictionaries and Autoencoders", Midwest Machine Learning Symposium, Chicago IL, June 2018.

"Provably Accurate Double-Sparse Coding", Information Theory and Applications Workshop, San Diego CA, February 2018.

"The Curse of Dimensionality", Big Data Seminar Series, Iowa State University, November 2017.

"Phase Retrieval: Challenges, Solutions, and Applications", Department of Mathematics Seminar, Iowa State University, October 2017.

"Fast(er) Algorithms for Machine Learning in High Dimensions", Department of Statistics Seminar, Iowa State University, September 2017.

"Fast Algorithms for Learning Latent Variables in Graphical Models", ACM KDD Mining and Learning with Graphs Workshop (spotlight presentation), Halifax NS, August 2017.

"Fast(er) Algorithms for Machine Learning in High Dimensions", The Alan Turing Institute, London UK, August 2017.

"Phase Retrieval with Structured Sparsity", International Linear Algebra Society (ILAS) Conference, Ames IA, July 2017.

"SVD-free Algorithms for Low-Rank Matrix Recovery", SIAM Conference on Optimization, Vancouver BC, Canada, May 2017.

"Stable Inversion of (Certain) Periodic Random Feature Maps", Information Theory and Applications Workshop, San Diego CA, February 2017.

"Iterative Thresholding for Demixing Structured Superpositions in High Dimensions", NIPS Workshop on Learning in High Dimensions, Barcelona, Spain, December 2016. ***Oral presentation; acceptance rate: 2/50.***

"A Fast Algorithm for Demixing Signals with Structured Sparsity", International Conference on Signal Processing and Communications, Bangalore, India, June 2016.

"Nearly Linear-Time Algorithms for Structured Sparsity", Information Theory and Applications Workshop, San Diego CA, February 2016.

"Learning Structured Sparse Representations Using Approximation", Joint Mathematics Society, Special Session on "Analysis, Geometry, and Data", Seattle WA, January 2016.

"Fast Algorithms for Structured Sparsity", EE Seminar, Indian Institute of Technology Bombay, Mumbai, India, October 2015.

"Fast Algorithms for Structured Sparsity", ECE Seminar, Indian Institute of Science, Bangalore, India, October 2015.

"Fast Algorithms for Structured Sparsity", Computer Science Colloquium, Iowa State University, Ames IA, September 2015.

Pre-ISU

"Nearly Linear-Time Algorithms for Structured Sparsity", International Symposium on Mathematical Programming (ISMP), Pittsburgh PA, July 2015.

"The Power of Structured Sparsity in Data Acquisition and Analysis", ECE Seminar, Ohio State University, Columbus OH, April 2015.

"The Power of Structured Sparsity in Data Acquisition and Analysis", ECpE Seminar, Iowa State University, Ames IA, March 2015.

"Structured Sparsity: Models, Algorithms, and Applications", ECE Seminar, University of Illinois, Chicago IL, March 2015.

"Structured Sparsity: Models, Algorithms, and Applications", EECS Seminar, Washington State University, Pullman WA, February 2015.

"Structured Sparsity: Models, Algorithms, and Applications", EECS Seminar, University of California, Irvine CA, February 2015.

"Nearly Linear-Time Algorithms for Structured Sparsity", ECE Seminar, Rice University, Houston TX, October 2014.

"Nearly Linear-Time Algorithms for Structured Sparsity", ECE Seminar, University of Massachusetts, Amherst MA, October 2014.

"Linear Dimensionality Reduction of Large-Scale Datasets", PED Seminar Series, MIT Lincoln Laboratory, Lexington MA, March 2014.

"Approximation Algorithms for Structured Sparse Recovery", INFORMS Optimization Society Conference, Houston TX, March 2014.

"Approximation-Tolerant Model-Based Compressive Sensing", EIS Seminar, Carnegie Mellon University, Pittsburgh PA, November 2013.

"Approximation-Tolerant Model-Based Compressive Sensing", CSIP Seminar, Georgia Institute of Technology, Atlanta GA, October 2013.

"Sparse Modeling Techniques for Geological Exploration", Hunters Network Meeting, Massachusetts Institute of Technology, Cambridge MA, August 2013.

"A Convex Approach for Designing Good Linear Embeddings", Workshop on Sparse Fourier Transform etc., Massachusetts Institute of Technology, Cambridge MA, February 2013.

"Geometric Models for Signal Acquisition and Processing", University of Wisconsin, Madison WI, May 2012.

"Near-Isometric Linear Embeddings of Manifolds", KECoM Workshop, The Ohio State University, Columbus OH, May 2012.

"A Geometric Approach for Compressive Sensing", Shell Bellaire Technology Center, Houston TX, April 2012.

"Geometric Signal Models for Compressive Sensing", Mitsubishi Electric Research Labs, Cambridge MA, June 2011.

"Random Projections for Manifold Learning", IMA Workshop on Multi-Manifold Data Modeling, Minneapolis MN, October 2008.

Teaching Experience

At ISU

Spring 2019	CprE 310: Theoretical Foundations of Computer Eng. Professor)	Iowa State University
Fall 2018	CprE 310: Theoretical Foundations of Computer Eng. Professor)	Iowa State University
Spring 2018	EE 525X: Principles of Data Analytics for ECpE Professor (Evaluation: 4.8 (mean))	Iowa State University
Spring 2018	CprE 310: Theoretical Foundations of Computer Eng. Professor (Evaluation: 4.6 (mean))	Iowa State University
Fall 2017	CprE 310: Theoretical Foundations of Computer Eng. Professor (Evaluation: 4.4 (mean))	Iowa State University
Spring 2017	EE 525X: Principles of Data Analytics for ECpE Professor (Evaluation: 4.8 (mean))	Iowa State University
Fall 2016	CprE 310: Theoretical Foundations of Computer Eng. Professor (Evaluation: 4.4/5 (mean)	Iowa State University
Spring 2016	EE 525X: Principles of Data Analytics for ECpE Professor (Evaluation: 4.7/5 (mean))	Iowa State University
Fall 2015	EE 324: Signals and Systems II Professor (Evaluation: 4.8/5 (mean))	Iowa State University

Pre-ISU

Spring 2015	6.006: Introduction to Algorithms Instructor	Massachusetts Institute of Technology
Spring 2014	6.042: Mathematics for Computer Science Instructor	Massachusetts Institute of Technology
Summer 2010	Summer School on Image Analysis Teaching Assistant	Park City Mathematical Institute
2007-2011	ELEC 301, ELEC431, ELEC 531 Graduate Course Assistant	Rice University

Student Supervision

Graduate Students

[current]
Mohammadreza Soltani (PhD, Jan 2016-present)
Gauri Jagatap (PhD, August 2016-present)
Viraj Shah (PhD, August 2016-present)
Thanh Nguyen (PhD, August 2016-present)
Ameya Joshi (PhD, co-advised with Soumik Sarkar, August 2018-present)
Pranamesh Chakraborty (PhD, co-advised with Anuj Sharma, Jan 2018-present)
Rishikumar Sureshkumar (MS, co-advised with Brian Gelder, August 2018-present)
Amitangshu Mukherjee (MS, co-advised with Soumik Sarkar, June 2018-present)
Rahul Singh (MS, June 2018-present)
[graduated]
Charlie Hubbard (MS, May 2016-Dec 2017; First position: Hy-Vee Data Science Division)
Shen Fu (MS, co-advised with Prof. Daji Qiao, August 2016-Dec 2017)
Manaswi Podduturi (MS, May 2016-Feb 2018; First position: Kingland Analytics)
Jayganesh Rajaraman (MS, Aug 2017-May 2018; First position: Rockwell Automation)

Undergraduate Students

Yazan Okasha (Independent study, 2017-2018.)
Omar Taylor (Independent study, 2016-2017.)
Souparni Agnihotri (Independent study, 2016-2017.)
Yifan Liu (Independent study, 2018.)
Chun-Hao Lo (Independent study, 2016.)

Senior Design Mentoring

Alex Mortimer, Carter Scheve, Sam Howard, "Asset Management and Financial Factor Discovery", 2018.
Jose Candelario, Bradlee Stiff, Yifan Liu, Sam Park, "FollowMe: A Guided Autonomous Vehicle", 2017.
Cameron Cornick, Ashlyn Freestone, Yiru Gao, Wen-Chi Hsu, Zachary Snyder, "A Voice for Autism", 2016.
Daniel Kim, Ryan Ostwinkle, Johnny Panicola, Matt Ruebbelke, "Traffic Control Warning Lights", 2016.
Dillon Einck, Paul Gerlich, and Brian Shannan, "Machine Learning for Retinopathy Detection", 2015-2016.

ISU Future Faculty Program

Davood Hajinezhad, Fall 2016.
Ardhendu Tripathy, Fall 2017.

Professional Activities

Organizing Committee

2019	Midwest Big Data Summer School
2018	Midwest Big Data Summer School
2017	Midwest Big Data Summer School

Conference Session Chair

2017   IEEE GlobalSIP 2017

2017   Asilomar Conference on Signals, Systems, and Computers

2016   International Conference on Signal Processing and Communications (SPCOM)

Proposal Reviewer

2017   Society for Industrial and Applied Mathematics (SIAM)

2017   Israeli Science Foundation (ISF)

2016   German-Israeli Foundation for Scientific Research and Development

Technical Program Committees

2019   National Conference on Communication (NCC)

2018   International Conference on Machine Learning (ICML)

2018   IEEE International Conference on Computational Photography (ICCP)

2018   International Conference on Signal Processing and Communications (SPCOM)

2016   International Conference on Artificial Intelligence and Statistics (AISTATS)

2016   International Conference on Signal Processing and Communications (SPCOM)

2015   International Joint Conferences on Artificial Intelligence (IJCAI) - ML Track

2013   IEEE GlobalSIP Symposium on New Sensing and Statistical Inference Methods

Reviewer

Artificial Intelligence and Statistics (AISTATS)

ACM-SIAM Symposium on Discrete Algorithms (SODA)

ACM Symposium on Principles of Distributed Computing (PODC)

Applied Computational and Harmonic Analysis

Cambridge University Press

European Symposium on Algorithms (ESA)

EURASIP Journal on Advances in Signal Processing

IEEE Conference on Acoustics, Speech and Signal Processing (ICASSP)

IEEE Conference on Information Processing and Sensor Networks (IPSN)

IEEE Conference on International Transportation Systems (ITSC)

IEEE International Symposium on Information Theory (ISIT)

IEEE Journal on Selected Topics in Signal Processing

IEEE Signal Processing Letters

IEEE Signal Processing Magazine

IEEE Transactions on Cyber-Physical Systems

IEEE Transactions on Geoscience and Remote Sensing

IEEE Transactions on Information Theory

IEEE Transactions on Image Processing

IEEE Transactions on Knowledge and Data Engineering

IEEE Transactions on Pattern Analysis and Machine Intelligence

IEEE Transactions on Robotics

IEEE Transactions on Signal Processing

IEEE Transactions on Systems, Man and Cybernetics

IEEE Workshop on Computational Advances in Multi-Sensor Adaptive Processing

International Conference on Learning Representations (ICLR)

International Conference on Machine Learning (ICML)

International Journal on Applied Control and Signal Processing

Journal of Computational and Graphical Statistics

Journal of Optics

Neural Information Processing Systems (NIPS)

Neural Computation (NECO)

Pattern Recognition

Sampling Theory and Applications (SampTA)

SIAM Journal on Computing

SIAM Journal on Imaging Sciences

Signal Processing with Adaptive Sparse Structured Representations (SPARS)

Symposium on Theoretical Aspects of Computer Science (STACS)

Affiliations

2018-   Senior Member, IEEE

2018-   Senior Member, IEEE Signal Processing Society

2012-2018   Member, IEEE

2013-2018   Member, IEEE Signal Processing Society

2010-2011   Student member, AAAI

2007–2012   Student member, IEEE

Participant

2016-18	Information Theory and Applications (ITA) Workshop
2012	Workshop on Knowledge-Enhanced Compressive Sensing (KeCoM)
2009-2011	Winedale Workshop
2011	Rice University Office of Faculty Development Workshop
2011	Signal Processing Education Network (SPEN) Workshop
2010	Park City Mathematics Institute Summer Program on Image Processing
2008	IMA Workshop on Multi-Manifold Data Modeling and Applications
2008	IMA Workshop on Nonlinear Approximation Techniques using L1
2007	IPAM Workshop on Sparsity and High Dimensional Geometry

University Service

At ISU

2018-	ECSEL Mentor
2018	Panelist, VPR New Faculty Orientation
2016-	ECE representative, University Honors Committee
2016-2017	CoE representative, Data Science Minor Committee
2016-	Member, ECpE Graduate Admissions Committee
2016-	Member, Promotion and Tenure Review Committee
2016	Member, ABET Accreditation Subcommittee
2015-2016	Member, ECpE Faculty Search Committee
2015	Member, Senior Design Committee
2015-	Participant, EE/CprE 294 (Program Discovery)
2015-	Participant, EE/CprE 394 (Program Exploration)
2015-	Participant, Take Your Professor to Lunch (TYPTL) Program

Pre-ISU

2008-2009	President, Indian Students at Rice (ISAR)
2009-2010	Representative, Graduate Students Association (GSA), Rice University
2008-2010	Graduate Mentor, ECE Department, Rice University