CURRICULUM VITAE: NAMRATA VASWANI

I. CANDIDATE INFORMATION

A. Education

- Ph.D. (Electrical and Computer Engineering), 2004
  University of Maryland, College Park, MD
- B.Tech. (Electrical Engineering), 1999
  Indian Institute of Technology (IIT), Delhi, India

B. Academic Experience

- Anderlik Professor, Dept. of Electrical and Computer Engineering
  Iowa State University, Ames, IA (July 2019 – present)
- Professor, Dept. of Electrical and Computer Engineering
  Iowa State University, Ames, IA (July 2016 – present)
  - *Courtesy Professor, Dept. of Mathematics,*
    - *Iowa State University, Ames, IA (August 2013 – present)*
- Associate Professor, Dept. of Electrical and Computer Engineering
  Iowa State University, Ames, IA (August 2011 – June 2016)
  - *Faculty Professional Development Leave (sabbatical) at*
    - *University of Illinois, Urbana-Champaign (UIUC), Spring 2015*
- Assistant Professor, Dept. of Electrical and Computer Engineering
  Iowa State University, Ames, IA (August 2005 – July 2011)
- ***Research: Statistical Machine Learning foundations, signal processing, imaging***

C. Other Professional Employment

- Postdoctoral Fellow, School of Electrical and Computer Engineering
  Georgia Institute of Technology, Atlanta, GA (August 2004 – July 2005)
- Research Intern, Signal and Image Processing Division
  HRL (formerly Hughes Research Labs), Malibu, CA (June – October 2001)
- Graduate Research Assistant, Dept. of Electrical and Computer Engineering
  Univ. of Maryland, College Park, MD (August 1999 – July 2004)

D. Major Awards

- **AAAS Fellow (class of 2024)**
  for contributions to the field of statistical machine learning, particularly for dynamic structured high-dimensional data recovery
- **IEEE Fellow (class of 2019)**
  for contributions to dynamic structured high-dimensional data recovery
- **2014 IEEE Signal Processing Society (SPS) Best Paper Award** for the paper
  N. Vaswani and W. Lu*, "Modified-CS: Modifying Compressive Sensing for Problems with Partially Known Support", *IEEE Trans. Signal Processing*, vol. pp. 4595-4607, Sep. 2010.
- **2019 ECE Distinguished Alumni Award, University of Maryland, College Park**
  presented annually to alumni that have provided leadership / meritorious contributions in the broad field of engineering
- **2019 Iowa State University Award for Mid-Career Achievement in Research**
  recognizes faculty members who have demonstrated outstanding accomplishments in research and/or creative activity at the mid-career stage.

E. Other Honors

- Plenary Speaker at the Indian National Conference on Communications (NCC), February 2026
- Keynote talk at IEEE SSPICSCon 2024 (the Bangladesh Signal Processing conference)
- Keynote talk at NCVPRIPG 2019 (the Indian computer vision conference), December 2019
- Invited Speaker at NeurIPS 2023 Workshop on Deep Learning and Inverse Problems, December 2023
- Anderlik Professorship, Iowa State University, College of Engineering, July 2019 - present
- 2014 Iowa State University Early Career Engineering Faculty Research Award.
- Harpole-Pentair Assistant Professor, 2009-10
- SPARS 2019 paper (*Subspace Tracking with Missing Data and Matrix Completion)* finalist for Student Best Paper Contest

F. Citation Summary (November 29 2025)

- **https://scholar.google.com/citations?user=s-dQPO8AAAAJ&hl=en**
- **h-index:** 42
- **Total Citations:** 6081
- **Number of papers cited at least a hundred times:** 17
- **Four Most Cited Papers:**
  1. N. Vaswani and W. Lu*, "Modified-CS: Modifying Compressive Sensing for Problems with Partially Known Support," *IEEE Trans. Signal Processing*, vol. 58(9), pp. 4595-4607, Sep. 2010. ***Cited 620 times.*** **[2014 IEEE Signal Processing Society Best Paper Award]**
  2. N Vaswani, T Bouwmans, S Javed, P Narayanamurthy, "Robust Subspace Learning: Robust PCA, Robust Subspace Tracking, and Robust Subspace Recovery", IEEE Signal Processing Magazine, 2018. ***Cited 408 times***
  3. N. Vaswani, "Kalman Filtered Compressed Sensing," in *Proc. IEEE Intl. Conf. Image Processing (ICIP)*, 2008. ***Cited 389 times.***
  4. Y. Rathi, N. Vaswani, A. Tannenbaum, A. Yezzi, "Tracking Deforming Objects using Particle Filtering for Geometric Active Contours," *IEEE Trans. Pattern Analysis and Machine Intelligence (PAMI)*, vol. 29(8), pp. 1470-1475, Aug. 2007. ***Cited 283 times.***

G. Major Professional Service

- **Board of Governors, IEEE Signal Processing Society (SPS)**
  January 2021 – December 2023
- **Associate Editor, IEEE Transactions on Information Theory**
  October 2021 – December 2024
- **Area Editor (Special Issues), *IEEE Signal Processing Magazine***
  January 2018 – December 2020
- **Chair of Women in Signal Processing (WiSP) Committee of IEEE SPS**
  January 2018 – December 2020
- **Associate Editor, *IEEE Transactions on Signal Processing***
  Oct 2009 – Feb 2013, March 2017 – Dec 2018
- **Lead Guest Editor of a *Proceedings of the IEEE* special issue on**
  "Rethinking PCA for Modern Datasets: Theory, Algorithms and Applications"
  (co-editors: Yuejie Chi and Thierry Bouwmans)

H. CyMath-ISU K-12 Math Tutoring & Support

- CyMath is ISU College of Engineering's K-12 Math Tutoring and Support program founded by Dr. Vaswani in 2020. Its mission is to improve the likelihood of STEM college, research, and workforce success of all students by working to fill in gaps in their math skills early.
- Within CyMath, ECE, Math, Statistics, and other STEM graduate student or faculty volunteers and paid Math or Education undergraduate students tutor K-12 youth in grades 3-12 in math. The undergraduate students also manage session logistics. An AI-enabled math learning app is used to make tutoring easier and to encourage at-home math practice. Because
- CyMath has resulted in growth in math skills for all its students and in very large growth (sustained growth of 20-percentile points or more) for over a third of its students (6/15) within a year. It has helped many tutors improve their communication and teaching skills and find community. Details: https://www.ece.iastate.edu/~namrata/Cymath_brief.pdf
- Key features of CyMath are a learn-by-doing model, encouraging math practice at home, use of graduate student/faculty tutoring volunteers, low cost and scalability, flexibility, effective tech/AI use (math learning applications).

I. Funded Grants and Contracts

1. **CyMath: K-12 and College Math Tutoring as a Springboard to Strengthen Statewide Iowa Energy Workforce**
    a. **PI: Namrata Vaswani,** co-PI: None
    b. Agency: Iowa Energy Center
    c. January 2026 – December 2028. Amount - $99,000
2. **Supplement for CIF: Small: Secure and Fast Federated Low-Rank Recovery from Few Column-wise Linear, or Quadratic, Projections**
    a. **PI: Namrata Vaswani**, co-PI: Aditya Ramamoorthy
    b. Agency: National Science Foundation (CISE -- CCF - CIF)
    c. July 2025 – June 2026, Amount - $112,900
3. **CIF: Small: Efficient and Secure Federated Structure Learning from Bad Data**
    a. **PI: Namrata Vaswani,** co-PI: none
    b. Agency: National Science Foundation (CISE -- CCF - CIF)
    c. July 2024 – June 2027, amount - $600,000
4. **Internal Grant: On Impact of Grade School Math Tutoring by MI-STEM Graduate Students and Faculty.**
    a. PI: Namrata Vaswani, co-PI: Mohamed Selim.
    b. Agency: ISU-VPR Office-Community Vitality RIR,
    c. June 2024 – May 2025. Amout: $70,000
5. **Fully Decentralized (Attack-)Resilient Dynamic Low-Rank Matrix Learning**
    a. Agency: National Science Foundation (Engineering – ECCS)
    b. PI: Shana Moothedath. **Role: co-PI.**
    c. Sept 2022 – Aug 2025, amount - $300,000
6. **CIF: Small: Secure and Fast Federated Low-Rank Recovery from Few Column-wise Linear, or Quadratic, Projections**
    a. **PI: Namrata Vaswani**, co-PI: Aditya Ramamoorthy
    b. Agency: National Science Foundation (CISE -- CCF - CIF)
    c. July 2021 – June 2024, amount - $564,500
7. **HDR TRIPODS: D4 (Dependable Data-Driven Discovery) Institute: Phase I**
    a. Agency: National Science Foundation
    b. PI: Hridesh Rajan. **Role: funded senior personnel.**
    c. Oct 2019 – Sept 2022, amount- $1,531,995.
8. **CIF: Small: Structured High-dimensional Data Recovery from Phaseless Measurements**
    a. **PI: Namrata Vaswani**, co-PI: Chinmay Hegde

b. Agency: National Science Foundation (CISE -- CCF - CIF)
c. October 2018 – September 2021, amount - $499,041

9. **KLA-Tencor Grant (Gift) for research in outlier detection via robust PCA**
   a. **PI: Namrata Vaswani,** co-PI: none
   b. Agency: KLA-Tencor
   c. January 2018 – present (no end date), amount $67000
10. **CIF: Small: Online Algorithms for Streaming Structured Big-Data Mining,**
   a. **PI: Namrata Vaswani,** co-PI: none
   b. Agency: National Science Foundation (CISE -- CCF - CIF)
   c. October 2015 – September 2019, amount - $442,385
11. **Distributed Recursive Robust Estimation: Theory, Algorithms and Applications in Single and Multi-Camera Computer Vision**
   a. **PI: Namrata Vaswani,** co-PI: Nicola Elia.
   b. Agency: National Science Foundation (Engineering - ECCS)
   c. July 2015 – June 2019, amount: $250,000
12. **Novel Machine Learning Approaches for Low-light Image or Video Denoising**
   a. **PI: Namrata Vaswani,** co-PI: Soumik Sarkar
   b. Agency: Rockwell Collins and matching funds from Regents Innovations Fund
   c. January 2015-- May 2017 (after extension), amount - $200,000, my share - $100,000
13. **IDBR Type A – High-Throughput, Large-Scale Plant Phenotyping Platform**
   a. PI: Liang Dong, **Role: co-PI**
   b. Agency: National Science Foundation (Division of Biological Infrastructure)
   c. March 2014 – February 2017, amount ~ $697,550, my share ~ $180,000
14. **CIF: Small: Recursive Robust Principal Components Analysis (PCA)**
   a. **PI: Namrata Vaswani,** Co-PI: Fritz Keinert
   b. Agency: National Science Foundation (CISE -- CCF - CIF)
   c. September 2011 – August 2015, amount - $396,659, my share ~ $366,000
15. **RI: Small: Exploiting Correlated Sparsity Pattern Change in Dynamic Vision Problems**
   a. **PI: Namrata Vaswani,** Co-PI: none.
   b. Agency: National Science Foundation (CISE – IIS - RI)
   c. September 2011 – August 2015, amount - $204,395.
16. **CCF (CIF): Small: Recursive Reconstruction of Sparse Signal Sequences**
   a. **PI: Namrata Vaswani,** co-PI: none
   b. Agency: NSF (CISE – CCF - CIF)
   c. July 2009 – June 2013, amount - $279,279 + $12,000 (REU supplement)
17. **Change Detection in Nonlinear Systems and Applications in Shape Analysis**
   a. **PI: Namrata Vaswani,** co-PI: none.
   b. Agency: National Science Foundation (Engineering - ECCS)
   c. August 2007 – July 2011, amount - $265,529 + $12,000 (REU supplement)
18. **Internal Grant: Greenhouse on a Chip: A Fully Integrated Microfluidic Platform for Large-scale High-throughput Plant Phenomics**,
   a. PI: Liang Dong, **Role: co-PI**. my share ~ $10,000
   b. Agency: Plant Sciences Institute, Iowa State University
   c. July 2012 -- June 2013, amount~$52,000
19. **Internal Grant: New Faculty Grant Development Award**
   a. PI: Namrata Vaswani, co-PI: none
   b. Agency: Vice Provost for Research Office, Iowa State University
   c. June – August 2006, amount – $12,000

II. RESEARCH / CREATIVE ACTIVITIES

A. Scholarship (denotes student co-author; papers fully in bold are my most interesting works)***

- **Machine Learning Conference Papers**
  1. A. Singh*, A. Abbasi*, **N. Vaswani**, "Byzantine-Resilient Federated Alternating Gradient Descent and Minimization for Partly-Decoupled Low Rank Matrix Learning", *Proc. Intl. Conf. Machine Learning (ICML)*, 2025. *Acceptance Rate:27.5%*
  2. A. Singh*, **N. Vaswani**, "Secure and Fast Federated Few-Shot Learning", *Proc. Intl. Conf. Machine Learning (ICML)*, 2024. *Acceptance Rate:27.5%*
  3. J. Lin, S.Moothedath, **N. Vaswani**, "Fast and Sample Efficient Multi-Task Representation Learning in Stochastic Contextual Bandits", *Proc. Intl. Conf. Machine Learning (ICML)*, 2024. *Acceptance Rate:27.5%*
  4. S. Nayer*, P. Narayanamurthy*, **N. Vaswani**, "Phaseless PCA: Low-Rank Matrix Recovery from Column-wise Phaseless Measurements", *Proc. Intl. Conf. Machine Learning (ICML)*, 2019. *Acceptance Rate:22.6%*
  5. P. Narayanamurthy*, **N. Vaswani**, "Nearly Optimal Robust Subspace Tracking", *Proc. Intl. Conf. Machine Learning (ICML)*, 2018. *Long Talk. Acceptance Rate: 8.6%.*
  6. **N. Vaswani** and H. Guo*, "Correlated-PCA: Principal Components' Analysis when Data and Noise are Correlated", *Proc. Neural Info. Proc. Systems (NIPS),* 2016. *Acceptance rate: 22.7%*
  7. J. Zhan*, B. Lois*, H. Guo*, and **N. Vaswani**, "Online (and Offline) Robust PCA: Novel Algorithms and Performance Guarantees", *Proc. International Conf. Artificial Intelligence and Statistics (AISTATS)*, 2016. *Acceptance rate: 30.7%.*
  8. B. Song, **N. Vaswani**, A. Roy-Chowdhury, "Closed-loop Tracking and Change Detection in Multi-Activity Sequences," in *Proc. IEEE Intl. Conf. Computer Vision and Pattern Recognition (CVPR)*, 2007. ***Acceptance rate: 25%***.
  9. Y. Rathi, **N. Vaswani**, A. Tannenbaum, A. Yezzi, "Particle Filtering for Geometric Active Contours and Application to Tracking Deforming Objects," in *Proc. IEEE Intl. Conf. Computer Vision and Pattern Recognition (CVPR)*, 2005, ***Oral. Acceptance rate: 6%.***
  10. #**N. Vaswani**, A. Roy-Chowdhury, R. Chellappa, "Activity Recognition Using the Dynamics of the Configuration of Interacting Objects," in *Proc. IEEE Conf. Computer Vision and Pattern Recognition (CVPR)*, 2003. ***Acceptance rate: 25%.***

- **Journal Papers (most interesting ones are in bold)**
  1. S. Moothedath and **N. Vaswani**, "Decentralized Communication-Efficient Multi-Task Representation Learning", *IEEE Transactions on Control of Network Systems*, accepted with minor revisions, 2025
  2. **N. Vaswani, "AltGDmin: Alternating GD and Minimization for Partly-Decoupled (Federated) Optimization"**, *Foundations and Trends in Optimization, NOW Publishers,* 2025 (monograph)
  3. **A. Abbasi* and N. Vaswani, "Efficient Federated Low Rank Matrix Completion",** *IEEE Trans. Information Theory,* 2025.
  4. A. Singh* and **N. Vaswani**, "Byzantine-Resilient Federated PCA and Low Rank Column-wise Sensing", *IEEE Trans. Information Theory,* 2024.
  5. **N. Vaswani, "Efficient Federated Low Rank Matrix Recovery via Alternating GD and Minimization: A Simple Proof",** ***IEEE Trans. Information Theory,*** **2024.**
  6. K Konstantinidis, **N. Vaswani,** A Ramamoorthy, "Detection and Mitigation of Byzantine Attacks in Distributed Training", *IEEE/ACM Transactions on Networking*, 2023
  7. S. Babu*, S. Lingala, **N. Vaswani**, "Fast Low Rank Column-wise Compressive Sensing for Accelerated Dynamic MRI", *IEEE Trans. Computational Imaging*, 2023

8. S. Nayer*, N. Vaswani, "**Fast and sample-efficient federated low rank matrix recovery from column-wise linear and quadratic projections**", *IEEE Trans. Information Theory,* 2023.
9. P. Narayanamurthy*, **N. Vaswani**, A. Ramamoorthy. "Federated Over-Air Subspace Tracking from Incomplete and Corrupted Data", *IEEE Trans. Signal Processing*, July 2022.
10. N. Vaswani, "Correction to "Provable Low Rank Phase Retrieval", *IEEE Trans. Information Theory,* Feb. 2022.
11. S. Nayer*, N. Vaswani, "Sample-Efficient Low Rank Phase Retrieval", *IEEE Trans. Information Theory,* Dec*.,* 2021.
12. A. Das, A. Ramamoorthy, N. Vaswani, "Efficient and Robust Distributed Matrix Computations via Convolutional Coding", *IEEE Trans. Information Theory,* Sept., 2021.
13. N. Vaswani, "Nonconvex Structured Phase Retrieval: A Focus on Provably Correct Approaches", *IEEE Signal Processing Magazine,* Special Issue on Non-Convex Optimization, Sept. 2020.
14. P. Narayanamurthy*, N. Vaswani, **"Fast Robust Subspace Tracking via PCA in Sparse Data-Dependent Noise",** *IEEE Journal on Selected Topics in Information Theory (JSAIT),* special issue on Estimation and Inference, Nov. 2020.
15. S. Nayer*, P. Narayanamurthy*, N. Vaswani, "Provable Low Rank Phase Retrieval", *IEEE Trans. Information Theory*, Sept. 2020.
16. G. Jagatap, Z. Chen*, S. Nayer*, C. Hegde, **N. Vaswani**, "Sample Efficient Fourier Ptychography for Structured Data", *IEEE Trans. Computational Imaging*, 2019.
17. P. Narayanamurthy*, V. Daneshpajooh, **N. Vaswani**, "Provable Subspace Tracking from Missing Data and Matrix Completion", *IEEE Trans. Signal Processing*, 2019.
18. P. Narayanamurthy*, N. Vaswani, **"Provable Dynamic Robust PCA or Robust Subspace Tracking"***, IEEE Trans. Information Theory, 2018.*
19. **N. Vaswani** and P. Narayanamurthy*****, "Static and Dynamic Robust Principal Component Analysis (PCA) and Matrix Completion: A Review", *Proceedings of the IEEE*, August 2018 (special issue on Rethinking PCA for Modern Datasets).
20. **N. Vaswani, T. Bouwmans, S. Javed, P. Narayanamurthy*, "Robust Subspace Learning: Robust PCA, Robust Subspace Tracking, and Robust Subspace Recovery",** ***IEEE Signal Processing Magazine*****, July 2018.**
21. H. Guo and **N. Vaswani**, "Video Denoising via Dynamic Video Layering", to appear, *IEEE Signal Processing Letters*, 2018.
22. **N. Vaswani**, S. Nayer* and Y. Eldar, "Low Rank Phase Retrieval", *IEEE Trans. Signal Processing*, 2017.
23. **N. Vaswani** and J. Zhan*, "Recursive Recovery of Sparse Signal Sequences from Compressive Measurements: A Review", *IEEE Trans. Signal Processing*, 64 (13), 3523-3549, 2016
24. K. Santra, J. Zhan*, X. Song, E. Smith, **N. Vaswani** and J. Petrich, "What Is the Best Method to Fit Time-Resolved Data? A Comparison of the Residual Minimization and the Maximum Likelihood Techniques as Applied to Experimental Time-Correlated, Single-Photon Counting Data", *The Journal of Physical Chemistry*, B 120 (9), 2484-2490, 2016.
25. J. Zhan* and **N. Vaswani**, "Robust PCA with Partial Subspace Knowledge", *IEEE Trans. Signal Processing*, July, 2015.
26. J. Zhan* and N. Vaswani, **"Time Invariant Error Bounds for Modified-CS based Sparse Signal Sequence Recovery",** *IEEE Trans. Information Theory, March 2015.*
27. H. Guo*, C. Qiu* and **N. Vaswani**, "An Online Algorithm for Separating Sparse and Low-dimensional Signal Sequences from their Sum", *IEEE Trans. Signal Processing*, vol. 62(16), pp 4284-4297, August 2014.

28. C. Qiu*, N. Vaswani, B. Lois* and L. Hogben, **"Recursive Robust PCA or Recursive Sparse Recovery in Large but Structured Noise"**, *IEEE Trans. Information Theory*, August, 2014.
29. D. Xu, **N. Vaswani**, Y. Huang and J. U. Kang, "Modified Compressive Sensing Optical Coherence Tomography with Noise Reduction", *Optics Letters*, vol. 37(20), 4209-4211, Oct 2012.
30. W. Lu* and **N. Vaswani**, "Exact Reconstruction Conditions for Regularized Modified Basis Pursuit (reg-mod-BP)", *IEEE Trans. Signal Processing,* vol. 60 (5), pp. 2634-2640, May, 2012.
31. S. Das*, A. Kale, and **N. Vaswani**, "Particle Filter with Mode Tracker (PF-MT) for Visual Tracking across Illumination Changes", *IEEE Trans. Image Processing,* vol. 21(4), pp. 2340-2346, April, 2012.
32. W. Lu* and **N. Vaswani**, "Regularized Modified BPDN for Noisy Sparse Reconstruction with Partial Erroneous Support and Signal Value Knowledge", *IEEE Trans. Signal Processing,* vol. 60(1), pp. 182 – 196, Jan. 2012.
33. **N. Vaswani, "LS-CS-residual (LS-CS): Compressive Sensing on the Least Squares Residual," *IEEE Trans. Signal Processing*, vol. 58(8), pp. 4108-4120, Aug. 2010.**
34. S. Das* and **N. Vaswani**, "Nonstationary Shape Activities: Dynamic Models for Landmark Shape Change and Applications," *IEEE Trans. Pattern Analysis and Machine Intelligence (PAMI)*, vol. 32(4), pp. 579-592, Apr. 2010.
35. **N. Vaswani and W. Lu*, "Modified-CS: Modifying Compressive Sensing for Problems with Partially Known Support," *IEEE Trans. Signal Processing*, vol. 58(9), pp. 4595-4607, Sep. 2010 [2014 IEEE Signal Processing Society Best Paper Award].**
36. **N. Vaswani**, Y. Rathi, A. Yezzi, A. Tannenbaum, "Deform PF-MT: Particle Filter with Mode Tracker for Tracking Non-Affine Contour Deformations," *IEEE Trans. Image Processing*, vol. 19(4), pp. 841-857, Apr. 2010.
37. **N. Vaswani,** "Particle Filtering Algorithms for Multimodal Observation Likelihoods and Large Dimensional State Spaces," *IEEE Trans. Signal Proc*., vol. 56(10-1), pp. 4583-4597, Oct. 2008.
38. Y. Rathi, **N. Vaswani**, A. Tannenbaum, A. Yezzi, "Tracking Deforming Objects using Particle Filtering for Geometric Active Contours," *IEEE Trans. Pattern Analysis and Machine Intelligence (PAMI)*, vol. 29(8), pp. 1470-1475, Aug. 2007.
39. Y. Rathi, **N. Vaswani**, A. Tannenbaum, "A Generic Framework for Tracking using Particle Filter with Dynamic Shape Prior," *IEEE Trans. Image Processing*, vol. 16(5), pp. 1370-1382, May 2007.
40. **N. Vaswani**, "Additive Change Detection in Nonlinear Systems with Unknown Change Parameters," *IEEE Trans. Signal Processing*, vol. 55(3), pp. 859-872, Mar. 2007.
41. [#]**N. Vaswani**, R. Chellappa, "Principal Component Null Space Analysis for Image and Video Classification," *IEEE Trans. Image Processing*, vol. 15(7), pp. 1816-1830, Jul. 2006.
42. [#]**N. Vaswani**, A. Roy Chowdhury, R. Chellappa, "Shape Activity: A Continuous State HMM for Moving/Deforming Shapes with Application to Abnormal Activity Detection," *IEEE Trans. Image Processing*, vol. 14(10), pp. 1603-1616, Oct. 2005.
43. A. Ramamoorthy, **N. Vaswani**, S. Chaudhury, S. Bannerjee, "Recognition of Dynamic Hand Gestures," *Pattern Recognition*, vol. 36(9), pp. 2069-2081, Sep. 2003

- **Other Conference Papers**

(acceptance rate for most of the conferences listed below is around 45-50%)

1. M. Selim, R. Gibert, **N. Vaswani**, "Scalable K-8 Math Support for Equitable Engineering Success", *IEEE Frontiers in Education (FIE)*, 2025

2. S. Babu*, S. Lingala, N. Vaswani, "Fully Generalizable Few Shot Alternating Gradient Descent and Minimization for Real-Time Dynamic MRI", *International Society for Magnetic Resonance in Medicine Annual Meeting (ISMRM)*, 2025
3. A. Singh*, **N. Vaswani**, "Secure Algorithms for Vertically Federated Multi-Task Representation Learning", *IEEE Intl. Symp. Info. Theory (ISIT)*, 2025
4. S Babu*, W Alam, RZ Rusho, SG Lingala, N Vaswani , "Generalizable Real-time Accelerated Dynamic MRI", *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP),* 2025
5. A. Singh*, **N. Vaswani**, "Byzantine-Resilient Federated Principal Subspace Estimation", *IEEE Intl. Symp. Info. Theory (ISIT)*, 2024
6. S. Moothedath, **N. Vaswani**, "Decentralized Low Rank Matrix Recovery from Column-wise Projections by Alternating GD And Minimization", *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP),* 2024
7. A. Abbasi*, S. Moothedath, **N. Vaswani**, "AltGDMin for Fast Federated Low Rank Matrix Completion", *Proc. Allerton conference*, 2023
8. S. Babu*, **N. Vaswani**, "A Fast Algorithm for Low Rank + Sparse column-wise Compressive Sensing", *Proc. Allerton conference*, 2023
9. A. Abbasi*, S. Moothedath, **N. Vaswani**, "AltGDMin for Fast Federated Low Rank Matrix Completion", *Proc. Allerton conference*, 2023
10. A. Singh*, **N. Vaswani**, "Byzantine-resilient Federated Low Rank Column-wise Compressive Sensing", *Proc. Allerton conference*, 2023
11. S. Moothedath, **N. Vaswani**, "Comparing Decentralized Gradient Descent Approaches and Guarantees", *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP),* 2023
12. S. Babu*, S. Aviyente, **N. Vaswani**, "Tensor Low Rank column-wise Compressive Sensing for Dynamic Imaging", *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP),* 2023.
13. S. Moothedath and N. Vaswani, "Dec-AltProjGD: Fully-Decentralized Alternating Projected Gradient Descent for Low-Rank Column-wise Compressive Sensing", *Proc. IEEE Conf. Decision and Control (CDC)*, 2022
14. Z. Chen*, S. Nayer*, N. Vaswani, "Undersampled Dynamic Fourier Ptychography via Phaseless PCA", *Proc. IEEE Intl. Conf. Image Proc. (ICIP)*, 2022
15. S. Nayer*, N. Vaswani, "Fast low rank column-wise compressive sensing", *IEEE Intl. Symp. Info. Theory (ISIT),* 2022.
16. S. Babu*, S. Nayer*, S. Lingala, **N. Vaswani**, "Fast Low Rank Column-wise Compressive Sensing for Accelerated Dynamic MRI", *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP),* 2022.
17. P. Narayanamurthy*, **N. Vaswani**, A. Ramamoorthy, "Federated over-air Robust Subspace Tracking from Missing Data", *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP),* 2022.
18. S. Moothedath, N. Vaswani, "Fully Decentralized and Federated Low Rank Compressive Sensing", *American Controls Conference (ACC),* 2022.
19. S. Nayer*, N. Vaswani, "Sample-Efficient Low Rank Phase Retrieval", *IEEE Intl. Symp. Info. Theory (ISIT),* 2021.
20. A. Das, A. Ramamoorthy, N. Vaswani, "Efficient and Robust Distributed Matrix Computations via Convolutional Coding", *IEEE Intl. Symp. Info. Theory (ISIT),* 2021
21. S. Nayer, P. Narayanamurthy, N. Vaswani, "Fast Compressive PCA and Low-Rank Matrix Recovery", Asilomar 2020, Invited talk in Special session on Bilinear and Nonlinear Inverse Problems
22. P. Narayanamurthy*, **N. Vaswani**, "Subspace Tracking with Missing Data and Matrix Completion", *Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop,* 2019. Only abstracts. Oral. **Student Best Paper Award finalist**

23. S.Nayer*, P. Narayanamurthy*, **N. Vaswani**, "Phaseless PCA: Low-Rank Matrix Recovery from Column-wise Phaseless Measurements", *Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop,* 2019. Only abstracts. Oral.
24. S. Nayer*, **N. Vaswani**, "PhaST: Model-Free Phaseless Subspace Tracking", *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP),* 2019.
25. P. Narayanamurthy*, **N. Vaswani**, "Provable Memory-Efficient Online Robust Matrix Completion", *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP),* 2019
26. P. Narayanamurthy*, **N. Vaswani**, "Provable Subspace Tracking with Missing Entries", *IEEE Intl. Symp. Info. Theory (ISIT),* 2019
27. S. Nayer*, **N. Vaswani**, "Phaseless Subspace Tracking", GlobalSIP 2018
28. S. Nayer*, **N. Vaswani**, Low-Rank Phase Retrieval with Partial Subspace Knowledge, Asilomar 2018
29. P. Narayanamurthy*, **N. Vaswani**, Robust Subspace Tracking and Online Dynamic Robust PCA via Recursive Projected Compressive Sensing, Asilomar 2018 **(Invited)**
30. Gauri Jagatap, Zhengyu Chen, Chinmay Hegde, Namrata Vaswani, Model-corrected Low-Rank Ptychography, *Proc. IEEE Intl. Conf. Image Proc. (ICIP)*, 2018
31. P. Narayanamurthy*, **N. Vaswani**, "Nearly Optimal Robust Subspace Tracking: U A Unified Approach", *Proc. IEEE Data Science Workshop (DSW),* 2018
32. P. Narayanamurthy*, **N. Vaswani**, "Provable Dynamic Robust PCA or Robust Subspace Tracking", *IEEE Intl. Symp. Info. Theory (ISIT),* 2018
33. **N. Vaswani**, P. Narayanamurthy*, "PCA in Sparse Data-Dependent Noise", *IEEE Intl. Symp. Info. Theory (ISIT),* 2018
34. Sajid Javed, Praneeth Narayanamurthy, Thierry Bouwmans, Namrata Vaswani, Robust PCA and Robust Subspace Tracking: A Comparative Evaluation, *Proc. IEEE Statistical Signal Processing Workshop (SSP)*, 2018
35. P. Narayanamurthy*, **N. Vaswani**, A fast and memory-efficient algorithm for robust PCA (MEROP), *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP),* 2018
36. Zhengyu Chen, Gauri Jagatap, Seyedehsara Nayer, Chinmay Hegde, Namrata Vaswani, Low Rank Fourier Ptychography, *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP),* 2018
37. Gauri Jagatap, Zhengyu Chen, Chinmay Hegde, N. Vaswani, Sub-diffraction imaging using Fourier ptychography and structured sparsity, *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP),* 2018.
38. **N. Vaswani**, P. Narayanamurthy*, "Finite Sample Guarantees for PCA in Non-Isotropic and Data-Dependent Noise", *Proc. Allerton Conference,* 2017 **(Invited).**
39. S. Nayer*, **N. Vaswani** and Y. Eldar, "Low Rank Phase Retrieval", *Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop,* 2017. Only abstracts. Oral.
40. S. Nayer*, **N. Vaswani** and Y. Eldar, "Low Rank Phase Retrieval", *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP)*, 2017
41. S. Nayer* , **N. Vaswani** and Y. Eldar, "Low Rank Matrix Recovery From Column-Wise Phaseless Measurements", IEEE Statistical Signal Processing (SSP) workshop, 2016
42. H. Guo* and **N. Vaswani**, "Video denoising via online sparse and low-rank matrix decomposition"*, IEEE Statistical Signal Processing (SSP) workshop*, 2016
43. B. Lois* and **N. Vaswani**, "Online Robust Matrix Completion", *Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop,* 2015, only abstracts
44. B. Lois* and **N. Vaswani**, "Online Matrix Completion and Online Robust PCA", *Proc. IEEE Intl. Symp. Info. Theory (ISIT),* 2015
45. B. Lois* and **N. Vaswani**, "A Correctness Result for Online Robust PCA", *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP)*, 2015

46. J. Zhan* and N. Vaswani, Robust PCA with Partial Subspace Knowledge, *Proc. IEEE Intl. Symp. Info. Theory (ISIT),* 2014
47. J. Zhan* and N. Vaswani, Performance Guarantees for ReProCS -- Correlated Low-Rank Matrix Entries Case, *Proc. IEEE Intl. Symp. Info. Theory (ISIT),* 2014
48. H. Guo*, C. Qiu* and **N. Vaswani**, "Practical ReProCS for Separating Sparse and Low-dimensional Signal Sequences from their Sum – Part 2", *Proc. IEEE Global Conf. on Signal and Info. Processing (GlobalSIP)*, 2014
49. H. Guo*, C. Qiu* and **N. Vaswani**, "Practical ReProCS for Separating Sparse and Low-dimensional Signal Sequences from their Sum – Part 1", *Proc. IEEE Intl. Conf. Acous. Speech Sig. Proc. (ICASSP)*, 2014
50. B. Lois*, **N. Vaswani** and C. Qiu*, Performance Guarantees for Undersampled Recursive Sparse Recovery in Large but Structured Noise, *IEEE Global Conf. on Signal and Info. Processing (GlobalSIP)*, 2013 **(invited)**
51. C. Qiu* and **N. Vaswani**, Recursive Sparse Recovery in Large but Structured Noise - Part 2, *Proc. IEEE Intl. Symp. Info. Theory (ISIT)* 2013
52. J. Zhan* and **N. Vaswani**, Time Invariant Error Bounds for Modified-CS based Sparse Signal Sequence Recovery, *Proc. IEEE Intl. Symp. Info. Theory (ISIT)* 2013
53. C. Qiu*, **N. Vaswani** and L. Hogben, Recursive Robust PCA or Recursive Sparse Recovery in Large but Structured Noise, *Proc. IEEE Intl. Conf. Acous. Speech Sig. Proc. (ICASSP)*, 2013
54. J. Zhan*, **N. Vaswani** and I. Atkinson, Separating Sparse and Low-Dimensional Signal Sequence from Time-varying Undersampled Projections of their Sums, *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP)*, 2013
55. R. Sarkar*, **N. Vaswani** and S. Das, Tracking Sparse Signal Sequences from Nonlinear/Non-Gaussian Measurements and Applications in Illumination-Motion Tracking, *Proc. IEEE Intl. Conf. Acous. Speech. Sig. Proc. (ICASSP)*, 2013
56. C. Qiu* and **N. Vaswani,** Recursive Sparse Recovery in Large but Correlated Noise," *Proc. Allerton Conf. Communication, Control and Computing,* 2011
57. C. Qiu* and **N. Vaswani,** Support Predicted Modified-CS for Recursive Robust Principal Components' Pursuit, *Proc. IEEE Intl. Symp. Info. Theory (ISIT),* 2011
58. W. Lu*, T. Li*, I. Atkinson, **N. Vaswani**, Modified-CS-Residual for Recursive Reconstruction of Highly Undersampled Functional MRI Sequences, *Proc. IEEE Intl. Conf. Image Proc. (ICIP)*, 2011
59. F. Raisali* and **N. Vaswani**, Stability (over time) of Regularized Modified-CS (noisy) for Recursive Causal Sparse Reconstruction, *Proc. Conf. Info. Sciences and Systems (CISS)*, 2011
60. **N. Vaswani**, "Stability (over time) of Modified-CS for Recursive Causal Sparse Reconstruction," *Proc. Allerton Conf. Communication, Control and Computing,* 2010 **(invited).**
61. C. Qiu* and **N. Vaswani**, "Real-time Robust Principal Components' Pursuit", *Proc. Allerton Conf. Communication, Control and Computing,* 2010.
62. W. Lu* and **N. Vaswani**, "Exact Reconstruction Conditions and Error Bounds for Regularized Modified Basis Pursuit," *Proc. Asilomar Conf. Signals, Systems and Computers,* 2010.
63. S. Das* and **N. Vaswani**, "Particle Filtered Modified Compressive Sensing (PF-mod-CS) for tracking signal sequences," *Proc. Asilomar Conf. Signals, Systems and Computers,* 2010 **(invited).**
64. W. Lu* and **N. Vaswani**, "Modified Basis Pursuit Denoising (Modified-BPDN) for Noisy Compressive Sensing with Partially Known Support," in *Proc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP)*, 2010.

65. W. Lu* and **N. Vaswani**, "Modified Compressive Sensing for Real-time Dynamic MR Imaging," in *Proc. IEEE Intl. Conf. Image Processing (ICIP)*, 2009.
66. **N. Vaswani** and W. Lu*, "Modified-CS: Modifying Compressive Sensing for Problems with Partially Known Support," in *Proc. IEEE Intl. Symp. Information Theory (ISIT)*, 2009.
67. **N. Vaswani**, "Analyzing Least Squares and Kalman Filtered Compressed Sensing," in *Proc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP)*, 2009.
68. C. Qiu*, W. Lu* and **N. Vaswani**, "Real-time Dynamic MR Image Reconstruction using Kalman Filtered Compressed Sensing," in *Proc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP)*, 2009.
69. S. Das* and **N. Vaswani**, "Efficient importance sampling techniques for large dimensional and multimodal posterior computations," in Proc. *IEEE Digital Signal Processing/SPE Workshop*, Miami FL, Jan 2009 **(invited).**
70. **N. Vaswani,** Kalman Filtered Compressed Sensing," in *Proc. IEEE Intl. Conf. Image Processing (ICIP)*, 2008.
71. S. Das* and **N. Vaswani**, "Model-based Compression of Nonstationary Landmark Shape Sequences," in *Proc. IEEE Intl. Conf. Image Processing (ICIP)*, 2008.
72. A. Kale and **N. Vaswani**, Generalized ELL for Detecting and Tracking Through Illumination Model Changes," in *Proc. IEEE Intl. Conf. Image Processing (ICIP)*, 2008.
73. **N. Vaswani** and S. Das, "Particle Filter with Efficient Importance Sampling and Mode Tracking (PF-EIS-MT) and its Application to Landmark Shape Tracking," in *Proc. Asilomar Conf. Signals, Systems and Computers*, 2007 **(invited).**
74. **N. Vaswani,** "PF-EIS and PF-MT: New Particle Filtering Algorithms for Multimodal Observation Likelihoods and Large Dimensional State Spaces," in *Proc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP)*, 2007.
75. A. Kale, **N. Vaswani**, C. Jaynes, "Particle Filter with Mode Tracker (PF-MT) for Visual Tracking across Illumination Change," in *Proc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP)*, 2007.
76. **N. Vaswani,** A.Yezzi, Y. Rathi, A. Tannenbaum, "Time-varying Finite Dimensional Basis for Tracking Contour Deformations," in *Proc. IEEE Conf. Decision and Control (CDC)*, 2006.
77. B. Song, **N. Vaswani,** A.K. Roy-Chowdhury, "Summarization and Indexing of Human Activity Sequences," in *Proc. IEEE Conf. Image Processing (ICIP)*, 2006.
78. **N. Vaswani,** A. Yezzi, Y. Rathi, A. Tannenbaum, "Particle Filters for Infinite (or Large) Dimensional State Spaces – Part 1," in P*roc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP)*, 2006.
79. **N. Vaswani, "**Particle Filters for Infinite (or Large) Dimensional State Spaces – Part 2," in *Proc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP)*, 2006.
80. **N. Vaswani**, R. Chellappa, "NonStationary 'Shape Activities,'" in *Proc. IEEE Conf. Decision and Control (CDC)*, 2005.
81. **N. Vaswani**, "The Modified CUSUM Algorithm for Slow and Drastic Change Detection in General HMMs with Unknown Change Parameters," in *Proc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP)*, 2005.
82. **N. Vaswani**, "Change Detection in Partially Observed Nonlinear Dynamic Systems with Unknown Change Parameters," in *Proc. American Control Conf. (ACC)*, 2004.
83. **N. Vaswani**, R. Chellappa, "Classification Probability Analysis of Principal Component Null Space Analysis," in *Proc. Intl. Conf. Pattern Recognition (ICPR)*, 2004.
84. **N. Vaswani**, "Bound on Errors in Particle Filtering with Incorrect Model Assumptions and its Implication for Change Detection," in *Proc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP)*, 2004. ***Acceptance: 40-50%, Paper selected as an***

outstanding paper (top 15% papers) in Signal Processing Theory and Methods category of ICASSP papers. Net acceptance: 6-7.5%

85. **N. Vaswani**, A. Roy-Chowdhury, R. Chellappa, "Statistical Shape Theory for Activity Modeling," in *Proc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP)*, 2003.
86. **N. Vaswani**, R. Chellappa, "A Particle Filtering Approach to Abnormality Detection in Nonlinear Systems and its Application to Abnormal Activity Detection," in *Proc. 3rd Intl. Workshop on Statistical and Computational Theories of Vision*, held in conjunction with ICCV, 2003.
87. **N. Vaswani**, "A Linear Classifier for Gaussian Class Conditional Distributions with Unequal Covariance Matrices," in *Proc. Intl. Conf. Pattern Recog. (ICPR)*, 2002.
88. **N. Vaswani**, R. Chellappa, "Best View Selection and Compression of Moving Objects in IR Sequences," in *Proc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP)*, 2001.

- **Book Chapters**
  1. **N. Vaswani**, C. Qiu, B. Lois, H. Guo, J. Zhan, "Online (Recursive) Robust Principal Components' Analysis", in *Handbook on Robust Low-Rank and Sparse Matrix Decomposition: Applications in Image and Video Processing*, Eds. T. Bouwmans, CRC Press, Taylor and Francis Group
  2. **N. Vaswani** and W. Lu, "Recursive Reconstruction of Sparse Signal Sequences" in *Filtering from Undersampled Data with an Introduction to Compressed Sensing*, Springer, Eds M. Mihaylova, A. Carmi, S. Godsill, 2014
  3. W. Lu, I. Atkinson and **N. Vaswani**, "Recursive Reconstruction of Highly Undersampled Functional MRI Sequences", in *Physics, Image Reconstruction, and Analysis*, Taylor and Francis, Eds A. Majumdar and R. Ward, to appear.
  4. **N. Vaswani,** A.K. Agrawal, Q. Zheng, R. Chellappa, **"**Moving Object Detection and Compression in IR Sequences**,"** in *Computer Vision Beyond the Visible Spectrum*, B. Bhanu and I. Pavlidis, Eds. New York: Springer, 2004, ch. 5, pp. 141-165.

- **Formally Invited Lectures and Presentations at Universities and Companies**
  - Alternating GD & Minimization (AltGDmin) for Fast Communication-Efficient Federated Learning**, Invited Talk at ICASSP ML workshop, 2025**
  - Alternating GD & Minimization (AltGDmin) for Fast Communication-Efficient Federated Learning**, University of Maryland ECE department, September 2024,**
  - Women in Signal Processing (WiSP) Panel, **ICASSP 2023, Greece**
  - Sample-Efficient Low Rank Phase Retrieval, **Tufts University, ECE Dept Seminar, April 2022**
  - ECE Graduate Student Association Panel on Academic Careers

  (Outreach) University of Maryland, College Park, October 2021
  - Invited tutorial on High Dimensional Probability for Machine Learning

  Midwest Big Data Summer School, May 2021
  - **(Outreach) Invited speaker at IEEE SPS Gujarat chapter for International Women's Day**
  - Women in Signal Processing (WiSP) panel: How to make it professionally and personally

  (Outreach) Invited panelist at ICIP 2020 WiSP panel discussion
  - (Dynamic) Subspace Learning from "Bad" Data

  University of Illinois Urbana-Champaign (UIUC), ISE Dept Seminar, February 2020
  - Subspace Learning from "Messy" Data: Phaseless PCA and Robust Subspace Tracking

  University of Maryland, College Park, ECE Dept Seminar, September 2019
  - Robust and Phaseless PCA

Syracuse University, EECS Dept Colloquium, April 2019

- Dynamic Structured (Big) Data Recovery
  IMA, Univ of Minnesota (UMN), Data Science Seminar, March 2019
- Nearly Optimal Robust Subspace Tracking and Dynamic Robust PCA
  February Fourier Talks (FFT), Univ. of Maryland College Park (UMD), Feb 2019
- **Nearly Optimal Robust Subspace Tracking and Dynamic Robust PCA**
  - ECE Dept Seminar, Purdue University, West Lafayette, IN, Sept 2018
- **PCA and Robust PCA for Modern Datasets**
  - Invited tutorial at SPCOM 2018 at IISc Bangalore, July 2018
- **PCA and Robust PCA for Modern Datasets**
  - invited one-week short course at IIIT-Delhi under the Global Initiative of Academic Networks (GIAN) program of Indian government, Dec 2017
- **Memory-Efficient Dynamic Robust PCA**
  - **ITA 2018**
- **Dynamic Structured (Big) Data Recovery**
  - KLA-Tencor, February 2018
- **Memory-Efficient Dynamic Robust PCA**
  - ISN Seminar, ECE dept, Cornell University, Ithaca, NY, December 2017
- **Dynamic Structured (Big) Data Recovery**
  - ECE Dept. Seminar, Texas A&M (TAMU), College Station, TX, April 2017
- **Dynamic Robust PCA**
  - ECE Dept. Seminar, University of Rochester, Rochester, NY, March 2017
- **Online Dynamic Robust PCA**
  - Dept. Seminar, IIT-Bombay, March 2016
  - Dept. Seminar, IIT-Delhi, March 2016
  - Dept. Seminar, University of Southern California (USC), February 2016
- **Online Robust PCA or Online Sparse + Low-Rank Matrix Recovery**
  - Networks and DSP seminar, UC Berkeley, October 2015
  - Seminar in Communication Theory and Systems, UC San Diego (UCSD), Oct 2015
  - Information Systems Lab (ISL) Colloquium, Stanford University, October, 2015
  - EE Dept. seminar, Heriott-Watt University, Edinburgh, UK, June 2015
  - CSP seminar, University of Michigan, Ann Arbor, MI, March 2015
  - Michigan State University, East Lansing, MI, March 2015
  - DSP Seminar, University of Illinois, Urbana-Champaign (UIUC), March 2015
  - ECE Department Seminar, Carnegie Mellon University (CMU), Pittsburgh, PA, February 2015
  - California Institute of Technology (Caltech), Pasadena, CA, February 2015
  - Rice University, Houston, TX, November 2014
  - University of Texas at Austin (UT-Austin), TX, November 2014
  - Texas A&M University (TAMU), College Station, TX, November 2014
  - University of Iowa, Iowa City, IA, October 2014
- **Dynamic Structured Signals' Recovery and Applications in Bioimaging**
  - Northwestern University, April 2014
  - ECE Department Colloquium at University of Illinois, Urbana-Champaign (UIUC), December 2013
- **Recursive Sparse Recovery and Applications in Dynamic Imaging**
  - Department Seminar at Engineering division at Brown University, Providence, RI, February 2011
- **Recursive Reconstruction of Sparse Signal Sequences**

    - Iowa State Mathematics Dept Colloquium, October 2012
    - Indian Institute of Science (IISc), Bangalore, India, September 2011
    - University of Maryland, College Park, MD, March 2011
    - California Institute of Technology (CalTech), May 2010
    - Princeton University, May 2010
    - Johns Hopkins University (JHU), Baltimore, MD, March 2011
    - Mitsubushi Electric Research Labs (MERL), Boston, MA, May 2011
    - University of California, Santa Barbara (UCSB), May 2010
    - University of California, Los Angeles (UCLA), May 2010
    - Northwestern University, May 2010
    - University of California, San Diego (UCSD), October 2009
- **Formally Invited Lectures and Presentations at Workshops and Conferences**
  Invited Conference or Workshop Short Talks
  - Keynote talk at SPICSCON 2024, Bangladesh
  - Information Theory and Applications (ITA) workshop, San Diego, CA 2024
  - Information Theory and Applications (ITA) workshop, San Diego, CA 2023
  - Information Theory and Applications (ITA) workshop, San Diego, CA 2022 May
  - Fast Compressive PCA and Low-Rank Matrix Recovery
    - Asilomar 2020
  - Robust Subspace Tracking and Online Dynamic Robust PCA via Recursive Projected Compressive Sensing
    - Asilomar 2018
  - Nearly Optimal Robust Subspace Tracking
    - CISS 2018
  - Dynamic Robust PCA
    - ICCV 2017 Workshop on Robust Subspace Learning
  - Finite Sample Guarantees for PCA in Non-Isotropic and Data-Dependent Noise
    - Allerton 2017
  - Improved Performance Guarantees for Correlated-PCA: PCA when Data and Noise are Correlated
    - Information Theory and Applications (ITA) workshop, San Diego, CA, February 2017
  - Online and Offline Robust PCA: Novel Algorithms and Performance Guarantees
    - Information Theory and Applications (ITA) workshop, San Diego, CA, February 2016
  - A Correctness Result for Online Robust PCA
    - Information Theory and Applications (ITA) workshop, San Diego, CA, February 2015
  - A Correctness Result for Online Sparse + Low-Rank Matrix Recovery
    - International Conference on Signal Processing and Communications (SPCOM), Indian Institute of Science (IISc), Bangalore, India, July 2014
  - Recursive Robust PCA or Recursive Sparse Recovery in Large but Structured Noise
    - Information Theory and Applications (ITA) workshop, San Diego, CA, February 2014
  - Performance Guarantees for Undersampled Recursive Sparse Recovery in Large but Structured Noise
    - IEEE Global Conf. on Signal and Info. Processing (GlobalSIP), December 2013
  - Stability (over time) of Modified-CS for Recursive Causal Sparse Reconstruction
    - Allerton Conf. on Communications, Control and Computing, 2010
  - Particle Filtered Modified Compressive Sensing for tracking signal sequences

- Asilomar Conf. Signals, Systems and Computers, 2010.
- Causal and Recursive Reconstruction of Sparse Signal Sequences
  - Institute for Operations Research and Management Sciences (INFORMS) Annual Meeting, Compressed Sensing Special Session, San Diego, CA, October 2009
- Efficient importance sampling techniques for large dimensional and multimodal posterior computations
  - DSP Workshop, 2009
- Particle Filter with Efficient Importance Sampling and Mode Tracking (PF-EIS-MT) and its Application to Landmark Shape Tracking
  - Asilomar Conf. Signals, Systems and Computers, 2007

Invited Workshop Talks (long talks)

- PF-EIS and PF-MT: Particle Filtering with Efficient Importance Sampling and with Mode Tracking and Applications in Deformable Contour Tracking
  - SAMSI Sequential Monte Carlo Mid-Program Workshop, Raleigh, NC, February 2009
- Particle Filters for Large Dimensional State Spaces with Multimodal Observation Likelihoods
  - SAMSI Sequential Monte Carlo Opening Workshop, Raleigh, NC, September 2008
- Deformable Contour Tracking
  - SAMSI Workshop on Geometry and Statistics of Shape Spaces, Raleigh, NC, July 2007
- Deformable Contour Tracking
  - IPAM Workshop on Image Processing for Random Shapes, Los Angeles, CA, May 2007
- Deformable Contour Tracking
  - IMA Workshop on Shape Spaces, Minneapolis, MN, April 2006

III. TEACHING / EDUCATION ACTIVITIES

A. Instruction for ISU

- **Graduate courses**
  - High-dimensional Probability and Linear Algebra for Machine Learning (EE 623X): new course started in Fall 2021
  - Special Topics: Statistical Machine Learning (EE 520): Fall 2015, Fall 2016, Fall 2019
  - Special Topics: Compressive Sensing and Matrix Completion (EE 520): Spring 2013
  - Special Topics: Compressive Sensing (EE 520): Spring 2009
  - Estimation and Detection Theory (EE 527): Spring 2008, Spring 2010, Spring 2012, Spring 2014, offered to off-campus students in all years
  - Digital Signal Processing (EE 524): Fall 2010
  - Digital Image Processing (EE 528): Spring 2007, Fall 2009
  - Special Topics: Computer Vision (EE 520): Fall 2005
- **Undergraduate courses**
  - Machine Learning: A Signal Processing Perspective (EE 425X)
    - Developed this new course in Spring 2019
  - Probabilistic Methods for Electrical Engineers (EE 322)
  - Introduction to Digital Signal Processing (EE 424): taught once
  - Signals and Systems Recitations (co-instructor for it)

B. Curriculum Development Activity for ISU

- **High-dimensional Probability and Linear Algebra for Machine Learning (EE 623X)**
  - *New graduate course. Starting Fall 2021*
- **Machine Learning: A Signal Processing Perspective (EE 425)**
  - *New senior-year undergraduate or early graduate level course*
- Special topics course on Statistical Machine Learning (EE 520)
  - http://www.ece.iastate.edu/~namrata/MachineLearning_class/
- Special topics course on Matrix Completion and Compressive Sensing (EE 520)
  - http://www.ece.iastate.edu/~namrata/MC_CSclass
- Special topics course on Compressive Sensing (EE 520)
  - http://www.ece.iastate.edu/~namrata/CSclass
- Digital Image Processing (EE 528)
  - http://www.ece.iastate.edu/~namrata/EE528
- Estimation and Detection Theory (EE 527)
  - Updated the material on Bayesian estimation – MMSE estimation and Kalman filtering
  - Included a detailed discussion of laws of large numbers and Chernoff bounding based inequalities
- Added appropriate level modules on sparse recovery and compressive sensing (at appropriate levels) to various undergraduate and graduate courses
  - Signals and Systems I (EE 224) – lab on compressive sensing (beyond Nyquist)
  - Introduction to DSP (EE 424) – lab on undersampled MRI image reconstruction
  - Estimation and Detection Theory (EE 527) – two lectures on sparse recovery, compressive sensing problem definition, algorithms and applications
  - DSP (EE 524)

C. Service as Major Professor on Graduate Student Committees

- **Graduated Ph.D. students**

1. Ahmed Ali Abbasi, Ph.D., Fall 2025
2. Silpa Babu, Ph.D., Fall 2025
3. Zhengyu Chen, Ph.D., Fall 2022
   - Meta, California
4. Praneeth Narayanamurthy, Ph.D., Summer 2021. **Received Research Excellence Award and Teaching Excellence Award.**
   - Postdoc at Univ. of Southern California (USC)
5. Seyedehsara (Sara) Nayer, Ph.D., Spring 2021. **Received Research Excellence Award.**
   - ASML, California
6. Han Guo, Ph.D., Spring 2019
   - Adobe, San Jose, California
7. Jinchun Zhan, Ph.D., Fall 2015. **Received Research Excellence Award.**
   - Now at Google, Bay Area, California
8. Brian Lois, Ph.D., Summer 2015 (co-advised with Prof. Leslie Hogben, Mathematics major, EE co-major). **Received Research Excellence Award and Teaching Excellence Award**
   - Data Scientist at AT&T, Dallas
9. Man Basnet, Ph.D., Summer 2013 (co-advised with Prof. Fritz Keinert, Mathematics major, EE co-major),
   - Lecturer in Mathematics dept. at ISU
10. Chenlu Qiu, Ph.D., Summer 2013,
    - Scientist at Traffic Management Research Institute, China

11. Wei Lu, Ph.D., Fall 2011,
    - Senior Algorithms Engineer at KLA-Tencor, San Jose, CA
12. Samarjit Das, Ph.D., Fall, 2010, Received **Teaching Excellence Award.**
    - Principal AI Scientist at Bosch Labs, Pittsburgh
    - **Received the College of Engineering Young Alum Award, 2022**

- **Graduated M.S. students**
  1. Komal Mogilipalepu, M.S., started Spring 2025
  2. Vaheed Daneshpajooh, M.S. Summer 2019
  3. Rituparna Sarkar, M.S., Fall 2012
  4. Fardad Raisali, M.S. Spring 2012
  5. Taoran Li, M.S. Summer 2011
- **Current Ph.D. Students**
  1. Ankit Pratap Singh, Ph.D. student, started Fall 2021
  2. Tusher Karmarker, Ph.D. student, started Fall 2025
  3. Chevonne McInnis, PhD student, co-advised with Steve Holland, AeroE
  4. Elham Oliyaei, Ph.D. student, Math.

D. Supervision of Undergraduate Research and Independent Study

- Robyn Zachary Barton, 2025, REU
- Chloe McAleer, 2025, REU
- Jolien Hidalgo Murra, 2025, REU
- Hae tha lay Paw, 2024, REU
- David Ntako, 2024-25, REU
- Grace Buhl, 2024-25
- Emma Buhl, 2024-25
- Amreen Chhinna, 2025
- Thenuki De Mel, 2025
- Reyna Hernandez Martinez, Summer 2019
- Christopher Sheafe (ECE), Trevor Steil (Math), Jonathan Lai (Math), REU students, Summer 2013
  - studied modified-CS, weighted CS using simulations as well as theoretical analysis.
- Tyler Stapler, REU student, Summer 2012
- Matt Boyce, REU student, Summer 2011
- Jennifer Nixon, REU student, Summer 2010
- Matt Rich, REU student, Spring 2010
- Xiang Li, undergraduate research student, Spring and Summer 2008

IV. OUTREACH and PROFESSIONAL SERVICE

A. **Outreach:**

- CyMath K-12 Math Tutoring & Support

B. Editorial Service for Journals

- Associate Editor, IEEE Transactions on Information Theory, October 2021 – 2024
- Area Editor (Special Issues), IEEE Signal Processing Magazine January 2018 – Dec 2020
- Chief Guest Editor of a forthcoming (2018) Proceedings IEEE Special Issue on
  - "Rethinking PCA for Modern Datasets: Theory, Algorithms and Applications" (co-editors: Yuejie Chi and Thierry Bouwmans)
- Guest Editor of a forthcoming (2018) Signal Processing Magazine Feature Cluster on "Exploiting Structure in Big Data Analytics – Sparse and Low-Rank Structures"
- Associate Editor, IEEE Transactions on Signal Processing
  March 2017 – present

October 2009 – February 2013

C. Offices Held in Professional Societies

- Technical Program Committee, IEEE ISIT, 2024, 2025
- Technical Program Committee, IEEE ITW 2025
- Board of Governors, IEEE Signal Processing Society (SPS), Jan 2021 – Dec 2023
- Chair of Women in Signal Processing Committee of IEEE Signal Processing Society, January 2018 – Dec 2020
- Steering Committee Member, Data Science Initiative of Signal Processing Society, April 2017 – present
- Elected member of the Signal Processing Theory and Methods technical committee of the IEEE Signal Processing Society, January 2016 – present
- Elected member of the Image Video and Multidimensional Signal Processing (IVMSP) technical committee of the IEEE Signal Processing Society, January 2015 – Dec. 2017
- Member of the Women in Signal Processing Committee of the IEEE Signal Processing Society, April 2015 – present

D. Tutorial Presentation, Workshop and Symposium Organization

- Invited tutorial at SPCOM 2018
    - PCA and Robust PCA for Modern Datasets
- Invited Short-Course Lecturer for a Global Initiatives of Academic Networks (GIAN) Course sponsored by the Government of India in Delhi in December 2017
    - PCA and Robust PCA for Modern Datasets: Theory, Algorithms, and Application
- Tutorial at ICASSP 2017
    - tutorial on Big Data Mining in Large but Structured Noise – in planning
- Symposium and Workshop Organization (as Co-Chair)
    - Robust Subspace Learning and Applications, Subspace Learning Workshop at ICCV 2017 (IEEE Intl. Conf. on Computer Vision)
    - Big Data Analysis and Challenges in Medical Imaging at GlobalSIP 2016
    - Robust Subspace Learning Workshop at ICCV 2015 (IEEE Intl. Conf. on Computer Vision)
    - Information Processing in Big Data Symposium at GlobalSIP 2014
    - Compressed Sensing and Matrix Completion Min-symposium at ILAS 2017 (Meeting of the International Linear Algebra Society) – in planning
- Area Chair for interpolation for IEEE Intl. Conf. Image Processing (ICIP), 2009
- Tutorials Chair for IEEE Intl. Conf. Image Processing (ICIP), 2008

E. Grant Review Panels

- National Science Foundation Panelist, 2008, 2010, 2011, 2012, 2016, 2018
- Served as an ad hoc reviewer for Israel Science Foundation

F. Other Activities

- Served on the Women in Signal Processing Panel at IEEE Intl. Conf. Image Processing (ICIP) 2020
- Technical Program Committee Member, IEEE Intl Conf. Sig. Proc. and Comm (SPCOM), IISc, Bangalore, 2012 and 2014
- Technical Program Committee Member, IEEE Statistical Signal Processing (SSP) Workshop 2012
- Organized Special Sessions at

    - Asilomar 2010: Recursive reconstruction of sparse signal sequences
    - ICIP 2008: Landmark shape sequence analysis
- Performed book proposal reviews for Cambridge University Press and others
- Program Committees: IEEE Intl. Conf. Comp. Vis. Pattern Recog. (CVPR), 2008, 2009; European Conf. Comp. Vis. (ECCV), 2008; IEEE Intl. Conf. Comp. Vis. (ICCV), 2007
- Journal Reviewing:
    - IEEE Trans. Signal Proc. (TSP), IEEE Trans. Information Theory, IEEE Trans. Image Processing (TIP), IEEE Trans. Pattern Analysis and Machine Intelligence (PAMI), EURASIP Journal on Applied Signal Processing, IEEE Trans. Auto. Control, and Automatica
- Conference Reviewing:
    - IEEE Intl. Conf. Acoustics, Speech and Signal Processing (ICASSP), IEEE Intl. Conf. Image Processing (ICIP), IEEE Intl. Conf. Comp. Vision (ICCV), IEEE Conf. Dec. and Control (CDC), Globecomm, Milcom
- Consulted for Zenph Sound Innovations in 2010
- Thesis Examiner for a Ph.D. student from University of Newcastle, Australia, 2011

V. INSTITUTIONAL SERVICE ACTIVITIES

A. University-Level Service
- CyMath K-12 Math Tutoring and Support – see above
- Member of ISU Mid-Career Award Evaluation Committee, 2020-23

B. College-Level Service
- CyMath K-12 Math Tutoring and Support – see above
- Member of ISU CoE Success Committee, 2024-25
- Member of ISU College of Engineering's Diversity Committee, Fall 2010 – Fall 2015, Spring 2023 – present

C. Department-Level Service
- Student Professional Development, 2025--present
- Awards Committee, 2024
- Member of Faculty Search Committee, 2022-23
- Member of Awards and Honors Committee, 2021 - present
- Chair of Seminars' Committee, 2018-19, 2019-20
- Member of Faculty Search Committee, 2016-17, 2018-19
- Member of the Department Chair Search Committee, 2015-2016
- Actively participated in recruiting faculty candidates for the Presidential Hiring Initiative on Big Data (not on search committee)
- Academic Area Chair for Communications and Signal Processing, 2013-present
- Member of Graduate Committee, 2013-present (except in Spring 2010 due to FPDA)
- Strategic Area Chair for Bioengineering, 2011-2012
- Course Coordinator for EE 322 (Probabilistic Methods for Electrical Engineers) and EE 528 (Digital Image Processing)
- Member, Graduate Admissions Committee, 2008-2009
- Member, Elections Committee, 2006-2008
- Member, Strategic Planning Committee, 2005-2006, 2009, 2012, 2013
- Member, Promotion and Tenure Committee, 2008-2009
- Member, Distinguished Lectures Committee, 2009-2010