

ADITYA RAMAMOORTHY

I. ESSENTIAL INFORMATION

A. Degrees Held

- Ph.D. (Electrical Engineering), 2005
University of California, Los Angeles, CA
- M. S. (Electrical Engineering), 2002
University of California, Los Angeles, CA
- B.Tech. (Electrical Engineering), 1999
Indian Institute of Technology (IIT), Delhi, India

B. Academic Positions Held

- Northrop Grumman Professor, Dept. of Electrical and Computer Engineering
Professor, Dept. of Mathematics (by courtesy)
Iowa State University, Ames, IA (July 2017 – Present).
- Faculty Professional Development Leave (FPDA), ECE Department
University of Illinois, Urbana-Champaign, IL (Jan. – Jun. 2015)
- Associate Professor, Dept. of Electrical and Computer Engineering
Iowa State University, Ames, IA (July 2012 – June 2016)
- Assistant Professor, Dept. of Electrical and Computer Engineering
Iowa State University, Ames, IA (August 2006 – June 2012)

C. Other Professional Employment

- Senior Design Engineer, Data Storage Signal Processing Group
Marvell Semiconductor Inc., Santa Clara, CA (August 2005 - August 2006).
- Research Intern, Communication and Signal Processing Group
Microsoft Research, Redmond, WA (June - October 2004).
- Systems Engineer, Biomorph VLSI, Inc.
Biomorph VLSI Inc., Westlake Village, CA (June 2000 – August 2001).

D. Honors and Awards

- Distinguished Lecturer, IEEE Information Theory Society, 2024-25.
- Ph.D. student Anindya B. Das won the 2022 Karas Award for the Outstanding Dissertation in Mathematical and Physical Sciences from Iowa State University.
- Holder of the Northrop Grumman Professorship from Jan. 2022.
- 2020 Iowa State University's College of Engineering Mid-Career Achievement in Research Award.

- 2019-2020 Boast-Nilsson Educational Impact Award.
- Best Poster Award, Midwest Machine Learning Symposium (MMLS) 2019 (with Ph.D. student Konstantinos Konstantinidis).
- 2012 NSF CAREER Award.
- 2012 Iowa State University's Early Career Engineering Faculty Research Award.
- Keynote speaker at the 2018 Australian Communication Theory Workshop.
- Invited participant in the following selective workshops.
 - The DIMACS Workshop on Network Coding: The Next 15 Years (2015).
 - Banff International Research Station (BIRS) workshop on Between Shannon and Hamming: Network Information Theory and Combinatorics (2015).
 - Banff International Research Station (BIRS) workshop on Science of Network Coding (2013).
 - The Nexus of Information and Computation Theories at the Institut Henri Poincare (IHP) in Paris (2016). Unable to attend owing to schedule issues.
 - Algorithmic Game Theory workshop at the Institute for Pure and Applied Mathematics (IPAM) at UCLA (2010).
- Invited to serve as a faculty opponent for the doctoral thesis of Ming Xiao, Chalmers University of Technology, Goteborg, Sweden, 2007.
- Harpole-Pentair Assistant Professor, Iowa State University, 2009 – 2011.
- IEEE Turbo Codes conference 2006 paper chosen as one of the best papers at the conference and invited for publication to the European Transactions on Telecommunications.
- Awarded the Regents of the University of California fellowship for Fall 2002 and Fall 2004.

Recognitions (Major Professional Service)

- Editor for the IEEE Transactions on Information Theory, from Oct. 22 – present and previously from Aug. 2016 - Aug. 2019.
- Editor for the IEEE Transaction on Communications, 2011 - 2015.
- Technical Program Committee (TPC) Chair (with Salim El Rouayheb) for the IEEE Workshop on Network Coding (NetCod) 2016.
- Publicity Chair, IEEE International Symposium on Information Theory (ISIT), 2012.
- Workshop Chair (with Joao Barros), International Workshop on Information Theory for Sensor Networks (WITS), 2008 held in conjunction with International Conference on Distributed Computing in Sensor Systems (DCOSS), 2008.

E. Citation Summary (according to Google Scholar)

- **h-index:** 32.
- **i10-index:** 63.
- Total number of citations – 4011.

II. RESEARCH / CREATIVE ACTIVITIES

A. Scholarship

Denotes any publication derived from the candidate's thesis/dissertation.

+ *Denotes student or postdoc co-author*

1. Articles in Peer-Reviewed Journals – In Print or Accepted

1. K. Konstantinidis⁺, Namrata Vaswani and **A. Ramamoorthy**, "Detection and Mitigation of Byzantine Attacks in Distributed Learning", IEEE/ACM Trans. on Networking, 2023 (to appear).
2. A. B. Das⁺, **A. Ramamoorthy**, D. J. Love and C. G. Brinton, "Distributed matrix computations with low-weight encodings", IEEE Journal on Sel. Areas in Info. Th., 2023 (to appear).
3. A. B. Das⁺ and **A. Ramamoorthy**, "A unified treatment of partial stragglers and sparse matrices in coded matrix computation", IEEE Journal on Sel. Areas in Info. Th., vol. 3(2), pp. 241-256, 2022.
4. P. Narayanamurthy⁺, N. Vaswani and **A. Ramamoorthy**, "Federated over-air robust subspace tracking from missing data", IEEE Trans. on Sig. Proc., vol. 70, pp. 3906-3920, 2022.
5. A. B. Das⁺ and **A. Ramamoorthy**, "Coded sparse matrix computation schemes that leverage partial stragglers", IEEE Trans. on Information Theory, vol. 68(6), pp. 4156-4181, 2022.
6. **A. Ramamoorthy** and L. Tang⁺, "Numerically stable coded matrix computations via circulant and rotation matrix embeddings", IEEE Trans. on Information Theory, vol. 68(4), pp. 2684-2703, 2022.
7. K. Son, **A. Ramamoorthy** and W. Choi, "Distributed Matrix Multiplication using group algebra for on-device edge computing", IEEE Sig. Proc. Letters, vol. 28, pp. 2097-2101, 2021.
8. A. B. Das⁺, **A. Ramamoorthy** and N. Vaswani, "Efficient and Robust Distributed Matrix Computations via Convolutional Coding", IEEE Trans. on Information Theory, vol. 67(9), pp. 6266-6282, 2021.
9. H. Ghasemi⁺ and **A. Ramamoorthy**, "Asynchronous Coded Caching with Uncoded Prefetching", IEEE/ACM Trans. on Networking, vol. 28(5), pp. 2146-2159, 2020.
10. K. Konstantinidis⁺ and **A. Ramamoorthy**, "Resolvable Designs for Speeding up Distributed Computing", IEEE/ACM Trans. on Networking, vol. 28(4), pp. 1657-1670, 2020.
11. **A. Ramamoorthy**, A. B. Das⁺ and L. Tang⁺, "*Straggler-resistant distributed matrix computation via coding theory*", IEEE Sig. Proc. Mag., vol. 37(3), pp. 136-145, 2020.
12. L. Tang⁺, K. Konstantinidis⁺ and **A. Ramamoorthy**, "*Erasure coding for distributed matrix multiplication for matrices with bounded entries*", IEEE Comm. Letters, vol. 23(1), pp.8-11, 2019.
13. A. S. Tripathy⁺ and **A. Ramamoorthy**, "*Sum-networks from incidence structures: construction and capacity analysis*", IEEE Trans. on Information Theory, vol. 64(5), pp. 3461-3480, 2018.

14. L. Tang⁺ and **A. Ramamoorthy**, "*Coded Caching Schemes with Reduced Subpacketization from Linear Block Codes*", IEEE Trans. on Information Theory, vol. 64(4), pp. 3099-3120, 2018.
15. B. Li, **A. Ramamoorthy** and R. Srikant, "*Mean-Field-Analysis of Coding versus Replication in Large Data Storage Systems*", ACM Transactions on Modeling and Performance Evaluation of Computing Systems, vol. 3(1), pp. 3:1-3:28, 2018.
16. H. Ghasemi⁺ and **A. Ramamoorthy**, "*Improved Lower Bounds for Coded Caching*", IEEE Trans. on Information Theory vol. 63(7), pp. 4388-4413, 2017.
17. O. Olmez⁺ and **A. Ramamoorthy**, "*Fractional repetition codes with flexible repair from combinatorial designs*", IEEE Trans. on Information Theory, vol. 62(4), pp. 1565-1591, 2016.
18. S. Huang⁺ and **A. Ramamoorthy**, "*On the multiple unicast capacity of 3-source, 3-terminal directed acyclic networks*", IEEE/ACM Trans. on Networking, vol. 22(1), pp. 285-299, 2014.
19. S. Salapaka, **A. Ramamoorthy** and M. V. Salapaka, "*AFM Imaging – Reliable or Not?*", IEEE Control Systems, vol. 33(6), pp. 106-118, 2013.
20. S. Huang⁺ and **A. Ramamoorthy**, "*An achievable region for the double unicast problem based on a minimum cut analysis*", IEEE Trans. on Communications, vol. 61(7), pp. 2890-2899, 2013.
21. N. Kumar⁺, **A. Ramamoorthy** and M. V. Salapaka, "*Error Analysis for ML sequence detection in ISI channels with Gauss-Markov Noise*", IEEE Trans. on Signal Processing, vol. 61(4), pp. 3647-3652, 2013.
22. **A. Ramamoorthy** and M. Langberg, "*Communicating the sum of sources over a network*", IEEE Journal on Selected Areas in Communications: Special Issue on In-network Computation: Exploring the Fundamental Limits, vol. 31(4), pp. 655-665, 2013.
23. S. Li⁺ and **A. Ramamoorthy**, "*Multiple-source Slepian-Wolf coding under a linear equation correlation model*", IEEE Transactions on Communications, vol. 60(9), pp. 2402-2407, Sept. 2012.
24. L. Ke, **A. Ramamoorthy**, Z. Wang, and H. Yin, "*Degrees of freedom Region for an Interference Network with General Message Demands*", IEEE Trans. on Information Theory, vol. 58(6), pp. 3787-3797, Jun. 2012.
25. **A. Ramamoorthy**, V. P. Roychowdhury, and S. K. Singh, "*Selfish Distributed Compression over Networks*", IEEE Trans. on Information Theory, vol. 58(5), pp. 3182-3197, May 2012.
26. A. E. Kamal, **A. Ramamoorthy**, L. Long and S. Li⁺, "*Overlay protection against link failures using network coding*", IEEE/ACM Trans. on Networking, vol. 19(2), pp. 1071-1084, Aug. 2011.
27. S. Huang⁺, **A. Ramamoorthy** and M. Medard, "*Minimum cost mirror sites using network coding: Replication vs. coding at the source nodes*", IEEE Trans. on Information Theory, vol. 57(2), pp. 1080-1091, Feb. 2011.
28. **A. Ramamoorthy**, "*Minimum cost distributed source coding over a network*", IEEE Trans. on Information Theory, vol. 57(1), pp. 461-475, Jan. 2011.
29. S. Li⁺ and **A. Ramamoorthy**, "*Protection against link errors and failures using network coding in overlay networks*", IEEE Trans. on Communications, vol. 59(2), pp. 518-528, Feb. 2011.

30. S. Li⁺ and **A. Ramamoorthy**, "Improved compression of network coding vectors using erasure decoding and list decoding", IEEE Comm. Letters, vol. 14(8), pp. 749-751, Aug. 2010.
31. N. Kumar⁺, P. Agarwal, **A. Ramamoorthy**, M. V. Salapaka, "Maximum-Likelihood Sequence Detector for Dynamic Mode High Density Probe Storage", IEEE Trans. on Communications, vol. 58(6), pp. 1686-1694, June 2010.
32. C. Shi⁺ and **A. Ramamoorthy**, "Design and Analysis of E²RC Codes", IEEE Journal on Selected Areas in Communications, vol. 27(6), pp. 889-898, 2009.
33. S. Li⁺ and **A. Ramamoorthy**, "Rate and power allocation under the pairwise distributed source coding constraint", IEEE Trans. on Communications, vol. 57(12), pp. 3771-3781, Dec. 2009.
34. J. Kim, **A. Ramamoorthy** and S. W. Mclaughlin, "Design of Efficiently-Encodable Rate-Compatible LDPC Codes", IEEE Trans. on Communications, vol. 57(2), pp. 365-375, Feb. 2009.
35. A. A. Somasundara, **A. Ramamoorthy** and M. B. Srivastava, "Mobile Element Scheduling with Dynamic Deadlines", IEEE Trans. Mobile Computing, vol. 6(4), pp. 395-410 Apr. 2007.
36. **A. Ramamoorthy**[#], K. Jain, P. A. Chou and M. Effros, "Separating Distributed Source Coding from Network Coding", IEEE Trans. on Information Theory, vol. 52(6), pp.2785-2795, Jun. 2006.
37. **A. Ramamoorthy**[#], J. Shi and R. D. Wesel, "On the Capacity of Network Coding for Random Networks", IEEE Trans. on Information Theory, vol. 51(8), pp. 2878-2885, Aug. 2005.
38. **A. Ramamoorthy**, N. Vaswani, S. Chaudhury, S. Banerjee, "Recognition of Dynamic Hand Gestures", Pattern Recognition, vol. 36(9), pp. 2069-2081, Sept. 2003.

2. Articles in Peer-Reviewed Journals – In Review

3. Book Chapters

- W. Henkel, H. Neto and **A. Ramamoorthy**, "Rate-Compatible LDPC and Turbo Codes for Link Adaptivity and Unequal Error Protection", Channel Coding: Theory, Algorithms and Applications, Academic Press Library in Mobile and Wireless Communications, (eds. D. Declercq, M. Fossorier and E. Biglieri), Elsevier E-book series: Mobile and Wireless Communications, 2014 (**invited**).
- S. Li⁺ and **A. Ramamoorthy**, "Networked Distributed Source Coding", Theoretical Aspects of Distributed Computing in Sensor Networks", Springer Verlag, June 2010 (**invited**).

4. Formally Invited Lectures and Presentations ((* denotes expenses partially or wholly paid by organizers)

1. “(*)*Coded matrix computation: numerical stability, partial stragglers and sparse input matrices*”, Simons Research Institute, Univ. of California, Berkeley, CA Mar. 2024.
2. “(*)*Coded matrix computation: numerical stability, partial stragglers and sparse input matrices*”, Institute for Defence Analysis – Center for Communications Research (IDA-CCR), Princeton, NJ, Oct. 2023.
3. “(*)*Coded matrix computation: numerical stability, partial stragglers and sparse input matrices*”, Dept. of Electrical and Computer Eng., New York University (NYU), Oct. 2023.
4. “*Coded matrix computation: numerical stability, partial stragglers and sparse input matrices*”, Center for Networked Intelligence., Indian Institute of Science, Bangalore, India Jun. 2022.
5. “*A Unified Treatment of partial stragglers and sparse matrices in coded matrix computation*”, IEEE Information Theory Workshop, Kanazawa, Japan, Oct. 2021.
6. “*A Unified Treatment of partial stragglers and sparse matrices in coded matrix computation*”, AMS Fall Central Sectional Meeting, Omaha, Oct. 2021.
7. “(*)*Leveraging Coding for Distributed Computing*”, Dept. of Electrical Eng. and Computer Science, University of Michigan, Ann Arbor, Oct. 2019.
8. “*Resolvable Designs for Coded Caching and Distributed Computing*”, Dept. of Electrical and Computer Eng., University of Minnesota, Twin Cities, Mar. 2019.
9. “*Distributed Matrix-Vector Multiplication: Connections to Universally Decodable Matrices and Convolutional Codes*”, Workshop on Information Theory and its Applications (ITA), Univ. of California, San Diego, Feb. 2019.
10. “*Coded Caching Schemes with Reduced Subpacketization from Linear Block Codes*”, Sun Yat-Sen University – Communications and Information Theory Workshop (SYSU-CITW), Nov. 2018.
11. “*C3LES: Codes for Coded Computation that Leverage Stragglers*”, IEEE Information Theory Workshop, Guangzhou, China Nov. 2018.
12. “(*)*Coded Caching Schemes with Reduced Subpacketization from Linear Block Codes*”, Indian Institute of Technology (IIT), Hyderabad, India, Jul. 2018.
13. “(*)*Coded Caching Schemes with Reduced Subpacketization from Linear Block Codes*”, International Institute of Information Technology (IIIT), Hyderabad, India, Jul. 2018.
14. “(*)*Coded Caching Schemes with Reduced Subpacketization from Linear Block Codes*”, IEEE International Conference on Signal Processing and Communications (SPCOM), Jul. 2018.
15. “(*)*Combinatorial Designs for distributed storage, caching and computation*”, Australian Communication Theory Workshop, Feb. 2018 (**Keynote talk**).
16. “*Combinatorial Designs for distributed data storage, function computation and coded caching*”, Dept. of Electrical and Computer Eng., University of California, Santa Barbara, Nov. 2017.
17. “*Low subpacketization level schemes for coded caching*”, Workshop on Information Theory and its Applications (ITA), Univ. of California, San Diego, Feb. 2017.

18. “*Combinatorial Designs for distributed data storage, function computation and coded caching*”, Dept. of Electrical and Computer Eng., Rice University, Houston, TX, Oct. 2016.
19. “(*)*Combinatorial Designs for distributed data storage, function computation and coded caching*”, Dept. of Electrical and Computer Eng., Texas A & M University, College Station, TX, Oct. 2016.
20. “*Combinatorial Designs for distributed data storage, function computation and coded caching*”, Wireless Networking & Communications Group Seminar, Dept. of Electrical and Computer Eng., Univ. of Texas, Austin, TX, Oct. 2016.
21. “(*)*Combinatorial Designs for distributed data storage, function computation and coded caching*”, Dept. of Electrical and Computer Eng., Ohio State University, Sep. 2016.
22. “*Combinatorial Designs for distributed data storage and distributed function computation*”, Dept. of Electrical Eng. and Computer Sc., University of California, Berkeley, Apr. 2016.
23. “(*)*Combinatorial Designs for distributed data storage and distributed function computation*”, Dept. of Electrical Eng., Indian Institute of Technology, Bombay, Mar. 2016.
24. “(*)*Combinatorial Designs for distributed data storage and distributed function computation*”, Dept. of Electrical Eng., Indian Institute of Technology, Delhi, Mar. 2016.
25. “(*)*Improved Lower Bounds for Coded Caching*”, DIMACS Workshop on Network Coding: The Next 15 Years, Dec. 2015.
26. “*Combinatorial Designs for distributed data storage and distributed function computation*”, Dept. of Electrical Eng, Columbia University, Dec. 2015.
27. “*Combinatorial Designs for distributed data storage and distributed function computation*”, Dept. of Electrical and Computer Eng, New York University, Dec. 2015.
28. “(*)*Distributed storage systems from combinatorial designs*”, Dept. of Electrical Engineering, Heriot-Watt University, Edinburgh, UK, Jul. 2015.
29. “(*)*Distributed storage systems from combinatorial designs*”, Banff International Research Station (BIRS) – Between Shannon and Hamming: Network Information Theory and Combinatorics, Mar. 2015.
30. “*PREMIER: Probabilistic Error-correction using Markov Inference in Errored Reads*”, Dept. of Electrical and Computer Eng, University of Illinois, May 2015.
31. “*Distributed Storage Systems from Combinatorial Designs*”, Dept. of Electrical and Computer Eng, University of Illinois, Mar. 2015.
32. “(*)*Distributed Storage Systems from Combinatorial Designs*”, Dept. of Electrical and Computer Eng., University of Notre Dame, Mar. 2015.
33. “*Distributed Storage Systems from Combinatorial Designs*”, Dept. of Electrical and Computer Eng., Purdue University, Mar. 2015.
34. “*Distributed Storage Systems from Combinatorial Designs*”, Dept. of Electrical Eng. and Computer Science, University of Michigan, Nov. 2014.
35. “(*)*Constructions of fractional repetition codes from combinatorial designs*”, IEEE International Conference on Signal Processing and Communications (SPCOM), Jul. 2014.

36. “(*)*Maximum likelihood sequence imaging: from DNA sequencing to nano-imaging*”, Fishbowl Seminar, Dept. of Electrical and Computer Eng., Texas A & M University, Mar. 2014 (by videoconferencing).
37. “*Maximum likelihood sequence imaging: from DNA sequencing to nano-imaging*”, Dept. of Electrical Eng. and Computer Science, Northwestern University, Mar. 2014.
38. “*PREMIER: Probabilistic Error-correction for DNA sequencers using Markov Inference in Errored Reads*”, Workshop on Information Theory and its Applications (ITA), Univ. of California, San Diego, Feb. 2014.
39. “(*)*On the multiple unicast capacity of 3-source, 3-terminal directed acyclic networks**”, Banff International Research Station – Workshop on Science of Network Coding, 2013.
40. “*PREMER Turbo: Probabilistic Error-correction using Markov Inference in Errored Reads using the Turbo principle*”, IEEE Global Conference on Signal and Information Processing (GlobalSIP), 2013.
41. “*Constructions of fractional repetition codes from combinatorial designs*”, 47th Asilomar Conference on Signals, Systems and Computers, 2013.
42. “*Repairable replication-based storage systems using combinatorial designs*”, Workshop on Information Theory and its Applications (ITA), Univ. of California, San Diego, Feb. 2013.
43. “*On the multiple unicast capacity of 3-source, 3-terminal directed acyclic networks*”, Workshop on Information Theory and its Applications (ITA), Univ. of California, San Diego, Feb. 2012.
44. “(*)*Networked Distributed Source Coding*”, Dept. of Electrical and Computer Eng., Indian Institute of Science, Sept. 2011.
45. “*Channel Modeling and Detector Design for Dynamic Mode High Density Probe Storage and Nano-Imaging Applications*”, 18th IFAC World Congress, Aug. 2011.
46. “*Networked Distributed Source Coding*”, Dept. of Electrical and Computer Eng., Univ. of Toronto, Apr. 2011.
47. “*High-density data storage based on dynamic mode atomic force microscopy (AFM): a communications perspective*”, Dept. of Electrical and Computer Eng., Univ. of Iowa, Apr. 2011.
48. “(*)*Networked Distributed Source Coding*”, Dept. of Electrical and Computer Eng., Univ. of Minnesota, Twin Cities, Mar. 2011.
49. “*An algebraic approach to Slepian-Wolf code design*”, Workshop on Information Theory and its Applications (ITA), Univ. of California, San Diego, Feb. 2011.
50. “(*)*Selfish Distributed Compression over Networks: Correlation Induces Anarchy*”, Algorithmic Game Theory (AGT) Workshop, Institute for Pure and Applied Mathematics (IPAM), Los Angeles, CA, Jan. 2011.
51. “*High-density data storage based on dynamic mode atomic force microscopy (AFM): a communications perspective*”, Dept. of Electrical Eng., Univ. of California, Los Angeles, Jan. 2011.
52. “*High-density data storage based on dynamic mode atomic force microscopy (AFM): a communications perspective*”, Coordinated Science Laboratory (CSL), Univ. of Illinois, Urbana-Champaign, Oct. 2010.

53. “*Network Coding for Function Computation*” Dept. of Electrical Eng. and Computer Sc., Massachusetts Inst. of Tech. (MIT), June 2010.
54. “*Network Coding for Function Computation*” Dept. of Electrical and Computer Eng., Univ. of Illinois, Chicago (UIC), May 2010.
55. “*Network Coding for Function Computation*” Dept. of Electrical and Computer Eng., Univ. of Wisconsin, Madison, Apr. 2010.
56. “*Communicating the sum of sources in a 3-sources/3-terminals network*”, Workshop on Information Theory and its Applications (ITA), Univ. of California, San Diego, Feb. 2010.
57. “*Network coding for distributed compression*”, Dept. of Computer Science, Univ. of Porto, Portugal Nov. 2007.
58. “(*)*Network coding for distributed compression*”, Dept. of Electrical and Computer Eng., Univ. of Iowa, Nov. 2007.
59. “(*)*Network coding for distributed compression*”, Dept. of Electrical and Computer Eng., Chalmers University of Technology, Goteborg, Sweden, Nov. 2007.

5. Peer-Reviewed Conference Proceedings, Bulletins, or Reports – In Print/Accepted(*) indicates highly selective conference proceeding).

1. A. B. Das⁺, **A. Ramamoorthy**, D. J. Love and C. G. Brinton, "*Preserving sparsity and privacy in straggler-resilient distributed matrix computations*", 59th Allerton Conf. on Communication, Control and Computing, 2023.
2. A. B. Das⁺, **A. Ramamoorthy**, D. J. Love and C. G. Brinton, "*Distributed matrix computations with low-weight encodings*", IEEE Intl. Symp. on Information Theory (ISIT), 2023.
3. K. Son and **A. Ramamoorthy**, "*Coded Matrix computation with gradient coding*", IEEE Intl. Symp. on Information Theory (ISIT), 2023.
4. A. B. Das⁺, **A. Ramamoorthy**, "*An integrated method to deal with partial stragglers and sparse matrices in distributed computations*", IEEE Intl. Symp. on Information Theory (ISIT), 2022.
5. K. Konstantinidis⁺ and **A. Ramamoorthy**, "*Aspis: Robust Detection for Distributed Learning*", IEEE Intl. Symp. on Information Theory (ISIT), 2022.
6. P. Narayanamurthy⁺, N. Vaswani and **A. Ramamoorthy**, "*Federated over-air robust subspace tracking from missing data*", IEEE Conf. on Acoustics, Speech and Sig. Proc., 2022.
7. A. B. Das⁺, **A. Ramamoorthy**, "*A unified treatment of partial stragglers and sparse matrices in coded matrix computation*", IEEE Information Theory Workshop (ITW), 2021 (**invited**).
8. **A. Ramamoorthy** and L. Tang⁺, "*Numerically stable coded matrix computations via circulant and rotation matrix embeddings*", IEEE Intl. Symp. on Information Theory (ISIT), 2021.
9. A. B. Das⁺, **A. Ramamoorthy**, "*Coded sparse matrix computation schemes that leverage partial stragglers*", IEEE Intl. Symp. on Information Theory (ISIT), 2021.

10. A. B. Das⁺, **A. Ramamoorthy** and N. Vaswani, "*Efficient and Robust Distributed Matrix Computations via Convolutional Coding*", IEEE Intl. Symp. on Information Theory (ISIT), 2021.
11. (*) K. Konstantinidis⁺ and **A. Ramamoorthy**, "*ByzShield: An Efficient and Robust System for Distributed Training*", Fourth Conf. on Machine Learning and Systems (MLSys), 2021.
12. **A. Ramamoorthy**, L. Tang⁺ and P. O. Vontobel, "*Universally Decodable Matrices for Distributed Matrix-Vector Multiplication*", IEEE Intl. Symp. on Information Theory (ISIT), 2019.
13. K. Konstantinidis⁺ and **A. Ramamoorthy**, "*CAMR: Coded Aggregated MapReduce*", IEEE Intl. Symp. on Information Theory (ISIT), 2019.
14. A. B. Das⁺ and **A. Ramamoorthy**, "*Distributed Matrix-Vector Multiplication: A Convolutional Coding Approach*", IEEE Intl. Symp. on Information Theory (ISIT), 2019.
15. A. B. Das⁺, L. Tang⁺ and **A. Ramamoorthy**, "*C³LES: Codes for Coded Computation that leverage stragglers*", IEEE Information Theory Workshop (ITW), 2018 (**invited**).
16. A. S. Tripathy⁺ and **A. Ramamoorthy**, "*Zero Error Function Computation on a Directed Acyclic Network*", IEEE Information Theory Workshop (ITW), 2018.
17. K. Konstantinidis⁺ and **A. Ramamoorthy**, "*Leveraging Coding Techniques for Speeding up Distributed Computing*", IEEE Global Communications Conference (GLOBECOM), 2018.
18. H. Ghasemi⁺ and **A. Ramamoorthy**, "*Algorithms for Asynchronous Coded Caching*", 51st Asilomar Conf. on Signals, Systems and Computers (**invited**), 2017.
19. H. Ghasemi⁺ and **A. Ramamoorthy**, "*Asynchronous Coded Caching*", IEEE Intl. Symp. on Information Theory (ISIT), 2017.
20. L. Tang⁺ and **A. Ramamoorthy**, "*Low Subpacketization Schemes for Coded Caching*", IEEE Intl. Symp. on Information Theory (ISIT), 2017.
21. L. Tang⁺ and **A. Ramamoorthy**, "*Coded Caching with Low Subpacketization Level*", IEEE Workshop on Network Coding and Applications (NetCod), 2016.
22. (*) B. Li, **A. Ramamoorthy** and R. Srikant, "*Mean-Field-Analysis of Coding versus Replication in Cloud Storage Systems*", IEEE Intl. Conf. on Computer Communications (INFOCOM), 2016 [18.25% acceptance rate].
23. L. Tang⁺ and **A. Ramamoorthy**, "*Coded Caching for Networks with the Resolvability Property*", IEEE Intl. Symp. on Information Theory (ISIT), 2016.
24. A. S. Tripathy⁺ and **A. Ramamoorthy**, "*On Computation Rates for Arithmetic Sum*", IEEE Intl. Symp. on Information Theory (ISIT), 2016.
25. H. Ghasemi⁺ and **A. Ramamoorthy**, "*Further results on lower bounds for coded caching*", IEEE Intl. Symp. on Information Theory (ISIT), 2016.
26. H. Ghasemi⁺ and **A. Ramamoorthy**, "*Improved lower bounds for coded caching*", IEEE Intl. Symp. on Information Theory (ISIT), 2015.
27. A. S. Tripathy⁺ and **A. Ramamoorthy**, "*Capacity of sum-networks for different message alphabets*", IEEE Intl. Symp. on Information Theory (ISIT), 2015.
28. A. S. Tripathy⁺ and **A. Ramamoorthy**, "*Sum-networks from undirected graphs: construction and capacity analysis*", 52nd Allerton Conf. on Communication, Control and Computing, 2014.

29. X. Yin, Z. Song⁺, K. S. Dorman and **A. Ramamoorthy**, "*PREMIER Turbo: Probabilistic Error-correction using Markov Inference in Errored Reads using the Turbo principle*", IEEE Global Conf. on Signal and Information Processing (GlobalSIP), **(invited)** 2013.
30. O. Olmez⁺ and **A. Ramamoorthy**, "*Construction of fractional repetition codes from combinatorial designs*", 47th Asilomar Conf. on Signals, Systems and Computers **(invited)**, 2013.
31. X. Yin, Z. Song⁺, K. S. Dorman and **A. Ramamoorthy**, "*PREMIER – Probabilistic Error-correction using Markov Inference in Errored Reads*", IEEE Intl. Symp. on Information Theory (ISIT), 2013.
32. S. Ghosal, G. Saraswat, **A. Ramamoorthy** and M. V. Salapaka, "*Topography Detection using Innovations Mismatch Method for high speed and high density dynamic mode AFM*", American Control Conference (ACC), 2013.
33. O. Olmez⁺ and **A. Ramamoorthy**, "*Replication based storage systems with local repair*", IEEE Intl. Workshop on Network Coding (NetCod), 2013.
34. O. Olmez⁺ and **A. Ramamoorthy**, "*Repairable Replication-based Storage systems Using Resolvable Designs*", 50th Allerton Conf. on Communication, Control and Computing, 2012.
35. S. Huang⁺ and **A. Ramamoorthy**, "*On the multiple unicast capacity of 3-source, 3-terminal directed acyclic networks*", IEEE Information Theory and Applications Workshop (ITA), **(invited)** 2012.
36. S. Huang⁺ and **A. Ramamoorthy**, "*An achievable region for the double unicast problem based on a minimum cut analysis*", IEEE Information Theory Workshop. (ITW), 2011.
37. S. Li⁺ and **A. Ramamoorthy**, "*Algebraic Codes for Slepian-Wolf code design*", IEEE Intl. Symp. on Information Theory (ISIT), 2011.
38. L. Ke, **A. Ramamoorthy**, Z. Wang and H. Yin, "*Degrees of freedom region for an interference network with general message demands*", IEEE Intl. Symp. on Information Theory (ISIT), 2011.
39. N. Kumar⁺, P. Agarwal, **A. Ramamoorthy** and M. V. Salapaka, "*Channel Modeling and Detector Design for Dynamic Mode High Density Probe Storage and Nano-Imaging Applications*", 18th IFAC World Congress, 2011.
40. S. Huang⁺ and **A. Ramamoorthy**, "*A note on the multiple unicast capacity of directed acyclic networks*", IEEE Intl. Conf. on Comm. (ICC), 2011.
41. C. Shi⁺ and **A. Ramamoorthy**, "*Improved Combinatorial Algorithms for Wireless Information Flow*", 48th Allerton Conf. on Communication, Control and Computing, pp. 875 - 880, 2010.
42. N. Kumar⁺, G. Saraswat, P. Agarwal, **A. Ramamoorthy** and M. V. Salapaka, "*High-speed Nano-imaging using dynamic mode AFM: A MAP detection approach*", 44th Asilomar Conference on Signals, Systems and Computers, pp. 1807 – 1811, 2010.
43. N. Kumar⁺, **A. Ramamoorthy** and M. V. Salapaka, "*Performance evaluation of ML sequence detection in ISI channels with Gauss Markov Noise*", IEEE GlobeCom, pp. 1 – 5, 2010.
44. M. Langberg and **A. Ramamoorthy**, "*Communicating the sum of sources in a 3-sources/3-terminals network; revisited*", IEEE Intl. Symp. on Information Theory (ISIT), pp. 1853 – 1857, 2010.

45. S. Huang⁺, **A. Ramamoorthy** and M. Medard, "*Minimum cost content distribution using network coding: Replication vs. coding at the source nodes*", IEEE Information Theory Workshop (ITW), pp. 1 – 5, 2010.
46. N. Kumar⁺, P. Agarwal, **A. Ramamoorthy**, M. V. Salapaka, "*Maximum-Likelihood Sequence Detector for Dynamic Mode High Density Probe Storage*", IEEE GlobeCom, pp. 1 – 6, 2009.
47. M. Langberg and **A. Ramamoorthy**, "*Communicating the sum of sources in a 3-sources/3-terminals network*", IEEE Intl. Symp. on Information Theory (ISIT), pp. 2121 – 2125, 2009.
48. S. Li⁺ and **A. Ramamoorthy**, "*Protection against link errors and failures using network coding in overlay networks*", IEEE Intl. Symp. on Information Theory (ISIT), pp. 986 – 990, 2009.
49. (*) **A. Ramamoorthy**, V. P. Roychowdhury and S. K. Singh, "*Selfish Distributed Compression over Networks*", IEEE INFOCOM '09 Mini-Conf., pp. 3011 – 3015, 2009 [26.6% acceptance rate].
50. C. Shi⁺ and **A. Ramamoorthy**, "*Design and Analysis of E^2RC Codes using EXIT Chart*", IEEE Intl. Conf. on Comm. (ICC), pp. 1 – 5, 2009.
51. C. Shi⁺ and **A. Ramamoorthy**, "*Protograph E^2RC Codes*", IEEE GlobeCom, pp. 1 – 5, 2008.
52. **A. Ramamoorthy**, "*Communicating the sum of sources over a network*", IEEE Intl. Symp. on Information Theory (ISIT), pp. 1646 – 1650, 2008.
53. S. Li⁺ and **A. Ramamoorthy**, "*Rate and power allocation under the pair-wise distributed source coding constraint*", IEEE Intl. Symp. on Information Theory (ISIT), pp. 2312 – 2316, 2008.
54. A. E. Kamal and **A. Ramamoorthy**, "*Overlay Protection against Link Failures using Network Coding*", 42nd Annual Conf. on Information Sciences and Systems (CISS), pp. 527 – 533, 2008.
55. N. Kumar⁺, P. Agarwal, **A. Ramamoorthy** and M. V. Salapaka, "*Channel modeling and detector design for dynamic mode high density probe storage*", 42nd Annual Conf. on Information Sciences and Systems (CISS), pp. 1273 – 1278, 2008.
56. **A. Ramamoorthy**, "*Minimum cost distributed source coding over a network*", IEEE Intl. Symp. on Information Theory (ISIT), pp. 1761 – 1765, 2007.
57. **A. Ramamoorthy** and N. Varnica, "*Error Floors of LDPC Coded BICM*", IEEE Intl. Conf. on Comm. (ICC), pp. 839 – 834, 2007.
58. J. Kim, W. Hur, **A. Ramamoorthy** and S. W. McLaughlin, "*Design of Rate-Compatible Irregular LDPC Codes for Incremental Redundancy Hybrid ARQ Systems*", IEEE Intl. Symp. on Information Theory (ISIT), pp. 1139 – 1143, 2006.
59. J. Kim, **A. Ramamoorthy** and S. W. McLaughlin, "*Design of Efficiently-Encodable Rate-Compatible Irregular LDPC Codes*", IEEE Intl. Conf. on Comm. (ICC), pp. 1131 – 1136, 2006.
60. J. Kim, **A. Ramamoorthy** and S. W. McLaughlin, "*Design of Efficiently-Encodable Rate-Compatible Irregular LDPC Codes*", 4th Intl. Symp. on Turbo Codes and Related Topics, pp. 1 – 6, 2006.
61. **A. Ramamoorthy** and R. D. Wesel, "*The Single Source Two Terminal Network with Network Coding*", 9th Canadian Workshop on Information Theory, June 2005.

62. A. Kansal, **A. Ramamoorthy**, G. J. Pottie and M. B. Srivastava, "*On Sensor Network Lifetime and Data Distortion*", IEEE Intl. Symp. on Information Theory (ISIT), 2005.
63. **A. Ramamoorthy**, K. Jain, P. A. Chou and M. Effros, "*Separating Distributed Source Coding from Network Coding*", 42nd Allerton Conf. on Communication, Control and Computing, Oct. 2004.
64. A. A. Somasundara, **A. Ramamoorthy** and M. B. Srivastava, "*Mobile Element Scheduling for Efficient Data Collection in Wireless Sensor Networks with Dynamic Deadlines*", IEEE International Real-Time Systems Symposium (RTSS), pp. 296 – 305, 2004.
65. **A. Ramamoorthy** and R. D. Wesel, "*Construction of Short Block Length Irregular LDPC Codes*", IEEE Intl. Conf. on Comm. (ICC), pp. 410 – 414, 2004.
66. W.-Y. Weng, **A. Ramamoorthy** and R. D. Wesel, "*Lowering the Error Floors of High-Rate LDPC Codes by Graph Conditioning*", IEEE Vehicular Technology Conference (VTC), pp. 2549 – 2553, Fall 2004.
67. **A. Ramamoorthy**, J. Shi and R. D. Wesel, "*On the Capacity of Network Coding for Random Networks*", 41st Allerton Conf. on Communication, Control and Computing, Oct. 2003.

B. Patents, Disclosures, and Technology Transfer

- **A. Ramamoorthy**, Z. Wu, and P. Sutardja, "*Multi-level memory controller with probability-distribution-based encoding*", United States Patent 9,053,051, granted Jun. 2015.
- A. Matache. H. Tang, G. Burd., **A. Ramamoorthy**, J. Xu, and Z. Wu, "*Apparatus for encoding and decoding using sparse matrices*", United States Patent 9,009,560, granted Apr. 2015.
- **A. Ramamoorthy**, Z. Wu, and P. Sutardja, "*Apparatus and method for encoding data for storage in multi-level nonvolatile memory*", United States Patent 8,856,622, granted Oct. 2014.
- P. Sutardja, Z. Wu. T. Doan, and **A. Ramamoorthy**, "*High density multi-level memory*", United States Patent 8,219,886, granted Jul. 2012.
- **A. Ramamoorthy**, "*Multi-level signal memory with LDPC and interleaving*", United States Patent 7,971,130, granted Jun. 2011.
- **A. Ramamoorthy**, G. Burd, and X. Yang, "*Method and apparatus for calibrating a read/write channel in a memory arrangement*", United States Patent 7,936,630, granted May 2011.
- D.-H. Kim, J. Kim, **A. Ramamoorthy**, S. W. McLaughlin, "*Apparatus and method for transmitting/receiving signal in a communication system*", United States Patent 7,904,792, granted Mar. 2011.
- A. E. Kamal and **A. Ramamoorthy**, "*I+N Network Protection for Mesh Networks: Network Coding-Based Protection Using P-Cycles and Protection Paths*", United States Patent 7,869,344, granted Jan. 2011.
- **A. Ramamoorthy**, Z. Wu, and P. Sutardja, "*Method and System for Error Correction in Flash Memory*", United States Patent 7,844,879, granted Nov. 2010

- A. Matache, H. Tang, G. Burd, **A. Ramamoorthy**, J. Xu, and Z. Wu, “*LDPC Codes and Expansion Method*”, United States Patent 7,774,675, granted Aug. 2010.
- **A. Ramamoorthy**, G. Burd, and X. Yang, “*Channel estimation for multi-level memories using pilot signals*”, United States Patent 7,649,793, granted Jan. 2010.

C. Funded Grants and Contracts

Summary of funding information:

- Since starting my position at Iowa State in Aug. 2006, the total amount of funding I have brought in is approximately **\$4.44 million**, out of which my share is approximately **\$3.1 million**.
- **Machine learning for efficient ansatz identification in variational quantum algorithms**
 - Investigators: **A. Ramamoorthy** (PI) and Thomas Iadecola (co-PI)
 - Granting Agency: **Translational AI Center (TrAC)** seed funding program.
 - Dates of beginning and end of grant: Feb. 2022 – Aug. 2022.
 - Total dollar amount of grant and amount allocated to candidate: \$20,000.
 - Role or responsibilities of the candidate: PI.
- **CIF: Small: Secure and Fast federated low-rank recovery from few column-wise linear or quadratic projections**
 - Investigators: N. Vaswani (PI) and **A. Ramamoorthy** (co-PI)
 - Granting Agency: **NSF** (CCF – Communications and Information Foundations).
 - Dates of beginning and end of grant: Jul. 2021 – Aug. 2024.
 - Total dollar amount of grant and amount allocated to candidate: \$564,500.
 - Role or responsibilities of the candidate: co-PI.
- **CIF: Small: Leveraging coding techniques for distributed computing**
 - Investigators: **A. Ramamoorthy** (sole PI)
 - Granting Agency: **NSF** (CCF – Communications and Information Foundations).
 - Dates of beginning and end of grant: Oct. 2019 – Oct. 2022.
 - Total dollar amount of grant and amount allocated to candidate: \$492,271.
 - Role or responsibilities of the candidate: sole PI.
- **CIF: Small: Towards practical coded caching**
 - Investigators: **A. Ramamoorthy** (sole PI)
 - Granting Agency: **NSF** (CCF – Communications and Information Foundations).
 - Dates of beginning and end of grant: July 2017 – July 2020.
 - Total dollar amount of grant and amount allocated to candidate: \$449,996.
 - Role or responsibilities of the candidate: sole PI.

- **CIF: Small: Distributed storage systems from combinatorial designs**
 - Investigators: **A. Ramamoorthy** (sole PI)
 - Granting Agency: **NSF** (CCF – Communications and Information Foundations).
 - Dates of beginning and end of grant: Aug. 2013 – Jul. 2017.
 - Total dollar amount of grant and amount allocated to candidate: \$399,999.
 - Role or responsibilities of the candidate: sole PI.

- **CAREER: Joint topographic imaging and materials characterization using atomic force microscopy: a systems approach**
 - Investigators: **A. Ramamoorthy** (sole PI)
 - Granting Agency: **NSF** (CCF – Communications and Information Foundations).
 - Dates of beginning and end of grant: Mar. 2012 – Mar. 2017.
 - Total dollar amount of grant and amount allocated to candidate: \$413,672.
 - Role or responsibilities of the candidate: sole PI.

- **CIF: Small: Collaborative Research: Signal processing for enabling high speed probe based nanoimaging**
 - Investigators: **A. Ramamoorthy** (PI at ISU) and M. V. Salapaka (PI at UMN). ISU was the lead institution
 - Granting Agency: **NSF** (CCF – Communications and Information Foundations).
 - Dates of beginning and end of grant: Jul. 2011 – Jul. 2015.
 - Total dollar amount of grant and amount allocated to candidate: \$446659 and \$245437.
 - Role or responsibilities of the candidate: sole PI from ISU.

- **ATD: Models for (Meta)Genome Identification from Next Generation Sequence Data with Errors**
 - Investigators: K. S. Dorman (PI), **A. Ramamoorthy** (co-PI), S. Aluru (co-PI) and B. Blitvich (co-PI).
 - Granting Agency: **NSF** (DMS – Division of Mathematical Sciences) & **DTRA**.
 - Dates of beginning and end of grant: Sep. 2011 – Sep. 2016.
 - Total dollar amount of grant and amount allocated to candidate: \$698,297 and \$224,048
 - Role or responsibilities of the candidate: co-PI.

- **CIF: Small: An Algebraic Approach to Distributed Source Coding**
 - Investigators: **A. Ramamoorthy** (sole PI)
 - Granting Agency: **NSF** (CCF – Communications and Information Foundations).
 - Dates of beginning and end of grant: Sep. 2010 – Sep. 2014 (one year extension was requested).
 - Total dollar amount of grant and amount allocated to candidate: \$350,571.

- Role or responsibilities of the candidate: sole PI.
- **ECCS: Collaborative Research: Dynamic Mode High Density Probe Based Data Storage**
 - Investigators: **A. Ramamoorthy** (PI at ISU), M. V. Salapaka (PI at UMN). UMN was the lead institution.
 - Granting Agency: **NSF** (ECCS – Power, Control and Adaptive Networks).
 - Dates of beginning and end of grant: Apr. 2008 – Apr. 2011.
 - Total dollar amount of grant and amount allocated to candidate: Exact total amount unknown (~ \$300,000) and \$99,994.
 - Role or responsibilities of the candidate: sole PI from ISU.
- **NeTS: NBD: Network Coding based Protection**
 - Investigators: A. Kamal (PI) and **A. Ramamoorthy** (co-PI)
 - Granting Agency: **NSF** (CNS – Computer and Network Systems).
 - Dates of beginning and end of grant: Aug. 2007 – Jul. 2011 (one year extension was requested).
 - Total dollar amount of grant and amount allocated to candidate: \$306,700 and \$149,698.
 - Role or responsibilities of the candidate: co-PI.
- **Faculty Development Grant from ISU VPR Office**
 - Investigators: **A. Ramamoorthy** (PI)
 - Granting Agency: **ISU VPR Office**.
 - Dates of beginning and end of grant: May 2007 – Aug. 2007.
 - Total dollar amount of grant and amount allocated to candidate: \$12,000
 - Role or responsibilities of the candidate: sole PI.

III. TEACHING / EDUCATION ACTIVITIES

A. Instruction for ISU

- **Graduate courses**
 - Quantum Information Theory (Mini-course): Fall 2021.
 - Quantum Computation (Mini-course): Fall 2020.
 - Probabilistic Methods in Computer Engineering (CPRE 528): Spring 2020.
 - Convex Optimization (EE 571): Fall 2018.
 - Topics in Communication: Network Coding (EE 520): Fall 2007, 2009.
 - Topics in Communication: Multi-User Information Theory (EE 520): Fall 2008 (co-taught with Prof. Zhengdao Wang).
 - Random Processes for Communication and Signal Processing (EE 523): Spring 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2016.
- **Undergraduate courses**
 - Theoretical Foundations of Computer Engineering (CPRE 310): Spring 2020, 2021, 2022.

- Communication Systems – II (EE 422): Spring 2010, 2011, 2012, 2013, 2014, 2016.
- Signals and Systems (EE 224): Fall 2013
- Signals and Systems (EE 224, Recitations or/and Labs): Fall 2006, 2010, 2011, 2012, 2014, 2015

B. Curriculum Development Activity for ISU

- EE 571 – Convex Optimization (2018 --)
 - This This is a course on convex optimization that is taken by several students from the ECpE, ME and AerE departments. I started teaching this course in Fall 2018. I have made several changes in the course to make it more relevant to current topics of interest within data science and machine learning. In particular, I have included discussions of several first-order and second-order methods for optimization.
- EE 422 – Analysis of Communication Systems (2010 – 2016)
 - This is a senior level class on the analysis of communication systems in the presence of noise. I modified the course content to ensure that the basics probability and random processes were thoroughly covered in the beginning of the class. In addition, I have emphasized the portion on digital communications significantly more than the analog communications part.
- EE 520 - Topics in Communication: Network Coding (2007 – 2009)
 - I introduced this as a special topics class on network coding. The class was taught mostly from the foundational papers in the field.
- EE 520 - Topics in Communication: Multi-user Information Theory (2008)
 - I co-taught a course on multi-user information theory with Prof. Zhengdao Wang. The primary motivation was that a first course in information theory does not allow one to discuss research level topics. We taught this course from newly published monographs on the topic.
- EE 523 - Random Processes for Communication and Signal Processing (2010 – 2016)
 - This is a required course for graduate students in the communications and signal processing area. I started teaching this course when I first started at Iowa State. The course was significantly revamped to make it significantly more rigorous. Furthermore, several advanced topics such as Markov Chains and an introduction to convergence of sequences of random variables was introduced. Over the years, I have had students from other areas and departments as well.

C. Service as Major Professor on Graduate Student Committees

Current Ph.D. students

- *Ruoyu Meng* (since Fall 2021). Research area: Quantum Information Theory.
- *Sifat Munim* (since Fall 2022). Research area: Coded Computation.

Graduated Ph.D. and M.S. students

- *Konstantintos Konstantinidis*, Ph. D., Spring 2017 - Fall 2022.
 - Dissertation title: “*Leveraging redundancy and coding techniques for speeding up distributed computing and securing distributed learning*”.

- Winner of the ISU Research Excellence Award and ISU Teaching Excellence Award.
- Software Engineer, C3AI.
- *Anindya B. Das*, Ph. D., Summer 2018 - Spring 2022.
 - Dissertation title: “*Coded approaches for straggler-resilient distributed matrix computations: Numerical stability, sparsity and leveraging partial computations*”.
 - Winner of the 2022 Karas Award, ISU Research Excellence Award and ISU Teaching Excellence Award.
 - Post-doctoral Fellow, Purdue University.
- *Li Tang*, Ph. D., Fall 2014 - Spring 2020.
 - Dissertation title: “*Algebraic Approaches for Coded Caching and Distributed Computing*”.
 - Software Engineer, Pinterest Inc.
- *Hooshang Ghasemi*, Ph. D., Spring 2014 - Spring 2019.
 - Dissertation title: “*Content Delivery Systems with Coded Caching*”.
 - Winner of the Research Excellence Award.
 - Senior Engineer, Qualcomm Inc.
- *Ardhendu Tripathy*, Ph. D., Fall 2012 - Spring 2018.
 - Dissertation title: “*Network coding for function computation*”.
 - Winner of the Research Excellence Award.
 - Tenure track assistant professor in the Computer Science department at Missouri S&T.
- *Shurui Huang*, Ph. D., Spring 2009 - Spring 2013.
 - Dissertation title: “*Network coding for multiple unicast over directed acyclic networks*”.
 - Winner of the Research Excellence Award.
 - Senior Quality Engineer, The Mathworks Inc.
- *Cuizhu Shi*, Ph. D., Fall 2006 - Spring 2011.
 - Dissertation title: “*Network flow algorithms for wireless networks and design and analysis of rate compatible LDPC codes*”.
 - Software Engineer, Google, Kirkland, WA.
- *Shizheng Li*, Ph. D., Fall 2007 - Summer 2011.
 - Dissertation title: “*Algebraic approaches to distributed compression and network error correction*”.
 - Vice President, Algorithmic Trading at AQR Capital Management.
- *Naveen Kumar*, Ph. D., (Prof. Murti V. Salapaka , co-advisor), Fall 2005 - Fall 2010.
 - Dissertation title: “*A communication system perspective for dynamic mode atomic force microscopy, with applications to high-density storage and nanoimaging*”.
 - Winner of the Research Excellence Award.
 - Manager, SK Hynix Memory Solutions Inc., San Jose, CA.
- *Yan Ren*, M. S., Fall 2012 - Fall 2015.
 - Thesis title: “*Multilevel sequence detection for dynamic mode atomic force microscopy*”.
- *Vahid Noroozi*, M. S., Fall 2012 - Fall 2015.
 - Thesis title: “*Probabilistic Insertion, Deletion and Substitution Error Correction using Markov Inference in Next Generation Sequencing Reads*”.

- *Wenyu Wang*, M. S., Fall 2011 - Spring 2015.
 - Thesis title: “*Fast estimation of nonlinearities in atomic force microscopy*”.
- *Shurui Huang*, M. S., Fall 2006 - Spring 2009.
 - Thesis title: “*Minimum cost content distribution using network coding: Replication vs. Coding*”.

Graduated Ph.D. students with significant collaborations

- *Xin Yin*, Ph. D., Fall 2010 - Fall 2016.
 - Dissertation title: “*Probabilistic methods for quality improvement in high-throughput sequencing data*” (Bioinformatics & Computational Biology, Statistics).
 - Software Engineer, EBay.

D. Supervision of Post-Doctoral Students and Professional Staff

- *Oktay Olmez*, Spring 2013 and Summer 2014, “*Distributed Storage Systems from Combinatorial Designs*”.
 - Associate Professor, Department of Mathematics, Ankara University, Turkey.

E. Supervision of Undergraduate Research and Independent Study

- *Fengxing Zhu*, Spring 2014 and Summer 2014, “*Numerical methods for estimating nonlinearities in atomic force microscopy*”
 - Graduate student in the EECS department at the Univ. of Michigan, Ann Arbor.
- *Alfonso Raymundo*, Summer 2010, REU student participant in the SPEED program. The SPEED program is a series of workshops for incoming freshmen who belong to under-represented groups.
- *Benjamin Green*, Fall 2008 – Fall 2009, REU student who worked on programming software defined radios using the GNU radio interface.
- *Prakalp Sudhakar*, Spring 2008, Freshmen Honors Mentor Program (HON 290H).

IV. EXTENSION/PROFESSIONAL PRACTICE ACTIVITIES

A. Editorial Service for Journals

- *IEEE Transactions on Information Theory*. Associate Editor in the area of “Networking and Computation” (Oct. 2022 – present). Associate Editor in the overall area of “Coding Techniques”. (Aug. 2016 – Aug. 2019).
- *IEEE Transactions on Communications*. Editor in the overall area of “Coding and Communication Theory”. My subfield within this area was “Network Coding and LDPC Codes” (Nov. 2011 – Feb. 2015).

B. Offices Held in Professional Societies

- *IEEE Central Iowa Chapter Chair*, 2010 – 2016.

C. Tutorial Presentation, Workshop and Symposium Organization

- Tutorial at the Information Theory Workshop (ITW) 2018.
 - Title: Coded Caching and Distributed Computing: Opportunities and Challenges (with Petros Elia, Eurecom, France).
- Publicity Chair, IEEE International Symposium on Information Theory (ISIT), 2012.
- Workshop Chair (with Joao Barros), International Workshop on Information Theory for Sensor Networks (WITS), 2008 held in conjunction with International Conference on Distributed Computing in Sensor Systems (DCOSS), 2008.

D. Grant Review Panels

- Served as a panelist on several NSF panels over the years. Had to decline many invitations owing to conflict of interest situations.
- Israel Science Foundation (ISF) reviewer in 2011.
- Contacted several times by the Research Grants Council (Hong Kong) and the Romanian National Research Council.

E. Public Service Activities

- Invited Speaker, IEEE Virtual Workshop Speaker Series on Early Career Faculty Development (ECFD).
- Volunteer judge for High School State Science and Technology Fair of Iowa: 2007 & 2008.
- Publicized the Shannon Centennial year (2016) at the Ames High School by screening short documentary films and presenting the basic ideas of information theory.

F. Other Extension/Professional Practice Activities

- Technical Program Committee Chair (with Salim El Rouayheb) for the 2016 IEEE Workshop on Network Coding (NetCod).
- Technical Program Committee Member, Conf. on Machine Learning and Systems (MLSys), 2022.
- Technical Program Committee Member, IEEE International Symposium on Information Theory (ISIT): 2008, 2014, 2016, 2018, 2019, 2020, 2021.
- Technical Program Committee Member, IEEE Information Theory Workshop (ITW): 2017, 2018, 2019, 2021.
- Technical Program Committee Member, IEEE Workshop on Network Coding (NetCod): 2015.
- Technical Program Committee Member, IEEE Global Communications Conference (GlobeCom): 2008, 2010, 2011, 2012, 2013.
- Technical Program Committee Member, IEEE International Conference on Communications (ICC): 2012, 2015, 2016.
- Technical Program Committee Member, IEEE International Conference on Signal Processing and Communications (SPCOM): 2012, 2014, 2016.

- Reviewer for all major journals and conferences in the field.
 - Journals: IEEE Journal on Selected Areas in Information Theory, IEEE Trans. on Information Theory, IEEE Trans. on Communications, IEEE Trans. on Signal Processing, IEEE Communication Letters, IEEE Signal Processing Letters, EURASIP Journal on Wireless Communications and Networking, Electronics and Telecommunications Research Institute (ETRI) Journal.
 - Conferences: Conf. on Machine Learning and Systems, IEEE International Symposium on Information Theory, IEEE Conf. on Communications, IEEE/ACM INFOCOM, IEEE Information Theory Workshop, IEEE GlobeCom, IEEE Vehicular Technology Conference, IEEE Conf. on Decision and Control.

V. INSTITUTIONAL SERVICE ACTIVITIES

A. University-Level Service

- Member of University Awards Committee, (Mar. 2011). Responsible for evaluating university level award nominees. This committee was organized by the VPR office and chaired by the Associate Vice President for Research.
- Panelist at the university level NSF CAREER grants workshop (Feb. 2014), organized by the VPR office. The workshop had over 150 attendees and was held in the Alliant Energy-Lee Liu Auditorium, Howe Hall.

B. Department-Level Service

- Member, Faculty Hiring Committee, 2021-2022.
- Director of Student Professional Development (since Fall 2018).
- Member, Promotion and Tenure Committee, 2018-2020.
- Member, post-tenure review committee for one ECpE faculty member in 2014.
- Chair, peer teaching evaluation committee for three ECpE faculty members in 2014 – 2015.
- Member, peer teaching evaluation committee for two ECpE faculty members in 2012 - 2013
- Member, Promotion and Tenure Committee, 2013-2014. (as associate professor).
 - Did not serve in Spring 2015 as I was on FPDA.
- Member, Seminar Series Committee, 2011-2013 and in 2015.
- Member, Senior Design Review Committee, 2011 – 2015.
- Member, Faculty Search Committee, 2008-2009, 2010-2011.
- Member, Strategic Planning Committee, 2007-2008, 2010-2011.
- Member, Promotion and Tenure Committee, 2009-2010 (as assistant professor).