Ardhendu S. Tripathy

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Education

05/2018 **Iowa State University**
Ph.D., Electrical and Computer Engineering, Minor in Mathematics
Dissertation: "Network Coding for Function Computation"

05/2012 **Indian Institute of Technology Kanpur**
B.Tech., Electrical Engineering

Appointments

11/20 -	Missouri University of Science and Technology, Computer Science department	Assistant Professor
06/18 - 10/20	University of Wisconsin-Madison, Wisconsin Institute for Discovery Optimization group	Postdoctoral Research Associate
09/12 - 05/18	Iowa State University, Electrical and Computer Engineering department	Graduate Research Assistant
05/17 - 08/17	Mitsubishi Electric Research Laboratories (MERL)	Summer Intern

Honors and Awards

2023 NSF CISE Research Initiation Initiative (CRII) Award [link]

2022 Highlighted Reviewer, International Conference on Learning Representations (ICLR) [link]

2018 Research Excellence Award, Iowa State University

2011 Best Project, Summer Undergraduate Research Grant for Excellence program, IIT Kanpur

2007 Certificate of Distinction, National Standard Examination in Physics and Astronomy, India.

2007 Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship, India.

2006 National Talent Search Exam (NTSE) Scholarship, India.

Publications

Note: * contributed equally and are listed alphabetically

Peer-reviewed conference papers

14. N. Seidi, A. Tripathy, and S. Das, "Using Geographic Location-based Public Health Features in Survival Analysis," *Proceedings of the Eighth IEEE/ACM Conference on Connected Health: Applications, Systems, and Engineering Technologies (CHASE)*, pp. 80-91, 2023. https://arxiv.org/abs/2304.07679

13. S. Mukherjee*, A. Tripathy*, and R. Nowak, "Chernoff Sampling for Active Testing and Extension to Active Regression," *Proceedings of the 25th International Conference on Artificial Intelligence and Statistics (AISTATS)*, in Proceedings of Machine Learning Research, 151:7384-7432, 2022. Available from https://proceedings.mlr.press/v151/mukherjee22a.html.

12. B. Mason, A. Tripathy, and R. Nowak, "Nearest neighbor search under uncertainty," *Proceedings of the 37th Conference on Uncertainty in Artificial Intelligence (UAI)*, in Proceedings of Machine Learning Research 161:1777-1786, 2021. Available from https://proceedings.mlr.press/v161/mason21a.html

11. M. Malloy, A. Tripathy, and R. Nowak, "Optimal Confidence Sets for the Multinomial Parameter," *2021 IEEE International Symposium on Information Theory (ISIT)*, 2021, pp. 2173-2178, doi: 10.1109/ISIT45174.2021.9517964. https://arxiv.org/abs/2002.01044

10. B. Mason, L. Jain, A. Tripathy, and R. Nowak, "Finding all ϵ-good arms in stochastic bandits," *Advances in Neural Information Processing Systems (NeurIPS)*, 33, 20707-20718, 2020. Available from https://proceedings.neurips.cc/paper/2020/hash/edf0320adc8658b25ca26be5351b6c4a-Abstract.html

9. A. Tripathy, Y. Wang, and P. Ishwar, "Privacy-Preserving Adversarial Networks," *2019 57th Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, 2019, pp. 495-505, doi: 10.1109/ALLERTON.2019.8919758. https://arxiv.org/abs/1712.07008

8. S. Katariya*, A. Tripathy*, and R. Nowak, "MaxGap Bandit: Adaptive Algorithms for Approximate Ranking," *Advances in Neural Information Processing Systems (NeurIPS)*, 32, 2019. Available from https://proceedings.neurips.cc/paper/2019/hash/9b16759a62899465ab21e2e79d2ef75c-Abstract.html

7. B. Mason*, A. Tripathy*, and R. Nowak, "Learning Nearest Neighbor Graphs from Noisy Distance Samples," *Advances in Neural Information Processing Systems (NeurIPS)*, 32, 2019. Available from https://proceedings.neurips.cc/paper/2019/hash/98c56bce74669e2e4e7a9fc1caa8c326-Abstract.html

6. A. Tripathy and A. Ramamoorthy, "Zero-error Function Computation on a Directed Acyclic Network," *2018 IEEE Information Theory Workshop (ITW)*, 2018, pp. 1-5, doi: 10.1109/ITW.2018.8613467. https://arxiv.org/abs/1805.03730

5. A. Tripathy and A. Ramamoorthy, "On computation rates for arithmetic sum," *2016 IEEE International Symposium on Information Theory (ISIT), 2016*, pp. 2354-2358, doi: 10.1109/ISIT.2016.7541720. https://arxiv.org/abs/1601.07228

4. A. Tripathy and A. Ramamoorthy, "Capacity of sum-networks for different message alphabets," *2015 IEEE International Symposium on Information Theory (ISIT)*, 2015, pp. 606-610, doi: 10.1109/ISIT.2015.7282526. https://arxiv.org/abs/1504.05618

3. A. Tripathy and A. Ramamoorthy, "Sum-networks from undirected graphs: Construction and capacity analysis," *2014 52nd Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, 2014, pp. 651-658, doi: 10.1109/ALLERTON.2014.7028517. https://arxiv.org/abs/1504.05618

2. A. Tripathy, L. Kumar, and R. M. Hegde, "Robust two-dimensional source localization using the MUSIC-Group delay spectrum," *2012 International Conference on Signal Processing and Communications (SPCOM)*, 2012, pp. 1-5, doi: 10.1109/SPCOM.2012.6290035.

1. A. Tripathy, L. Kumar, and R. M. Hegde, "Group delay-based methods for speech source localization over circular arrays," *2011 Joint Workshop on Hands-free Speech Communication and Microphone Arrays (HSCMA)*, 2011, pp. 64-69, doi: 10.1109/HSCMA.2011.5942411.

Journal papers

2. A. Tripathy and A. Ramamoorthy, "Sum-Networks from Incidence Structures: Construction and Capacity Analysis," in *IEEE Transactions on Information Theory*, vol. 64, no. 5, pp. 3461-3480, May 2018, doi: 10.1109/TIT.2017.2765661.

1. L. Kumar, A. Tripathy, and R. M. Hegde, "Robust Multi-Source Localization Over Planar Arrays Using MUSIC-Group Delay Spectrum," in *IEEE Transactions on Signal Processing*, vol. 62, no. 17, pp. 4627-4636, Sept.1, 2014, doi: 10.1109/TSP.2014.2337271.

Patent

1. Y. Wang, P. Ishwar, and A. Tripathy, "Data-driven privacy-preserving communication," United States Patent, No. 11,132,453.

Presentations

Invited talks

6. "Chernoff Sampling for Active Testing and Extension to Active Regression," Learning, Information, Optimization, Networks, and Statistics (LIONS) seminar series, Arizona State University, Oct 2022.
5. "MaxGap Bandit: Adaptive Algorithms for Approximate Ranking," Session on Recovering Permuted Data, Conference on Information Sciences and Systems (CISS), Princeton NJ, Mar. 2022.
4. "Generalized Chernoff Sampling," ARO MURI on Adaptive Exploitation of Non-commutative Multimodal Information Structure, Online, Oct. 2020.
3. "Adaptive Algorithms in Machine Learning," Theoretical and Applied Data Science Lunch-n-Learn at Iowa State University, Online, May 2020.
2. "Privacy-Preserving Adversarial Networks," Systems, Information, Learning and Optimization (SILO) seminar, UW-Madison, Nov. 2019.
1. "Network Coding for Function Computation," Graduation Day, Information Theory and Applications workshop, San Diego, CA, Feb. 2018.

Posters

5. "MaxGap Bandit: Adaptive Algorithms for Approximate Ranking," Bombay Information Theory Seminar, Indian Institute of Technology Bombay, Jan. 2020.
4. "Learning Nearest-Neighbor Graphs from Noisy Distance Samples," Midwest Machine Learning Symposium, UW-Madison, Jun. 2019.
3. "Zero-Error Function Computation on a Directed Acyclic Network," North American Summer school in Information Theory, Texas A&M, College Station TX, May 2018.

2. "Sum-Networks from Incidence Structures," DIMACS workshop on network coding: the next 15 years, Rutgers University, Dec. 2015.
1. "Capacity of sum-networks for different message alphabets," Croucher Summer school in Information Theory, Chinese University of Hong Kong, Jun. 2015.

Grants

3. **National Science Foundation.** "CRII: CIF: Sequential Decision-Making Algorithms for Efficient Subset Selection in Multi-Armed Bandits and Optimization of Black-Box Functions." Sole PI. Total amount $174,982. May 2023 - Apr 2025.
2. **Office of Naval Research.** "A Heterogeneous Secure Test-Bed for Machine Learning." Co-PI. Total amount $466,813. Feb 2023 - Jan 2024.
1. **Kummer Ignition Grant Initiative, Missouri S&T.** "Trustworthy Machine Learning and Artificial Intelligence-based Framework Development for Hybrid and Sustainable Energy Systems." Co-PI. Total amount $40,000. Jan 2022 - Jan 2023.

Classes taught

At Missouri S&T

Fall 2023	COMP SCI 6400: Advanced Topics in Artificial Intelligence	Enrollment: 39
Spring 2023	COMP SCI 5001: Probability and Computing **(new course developed)**	Enrollment: 34
Fall 2022	COMP SCI 5001: Reinforcement Learning	Enrollment: 19
Spring 2022	COMP SCI 6400: Advanced Topics in Artificial Intelligence	Enrollment: 43
Fall 2021	COMP SCI 3800: Introduction to Operating Systems	Enrollment: 13
Spring 2021	COMP SCI 5001: Reinforcement Learning **(new course developed)**	Enrollment: 6

At Iowa State University

Spring 2019	Guest lecturer in E E 520: Special Topics in Communications and Signal Processing: "Introduction to Stochastic Bandits"
Spring 2018	Graduate Teaching Assistant for E E 224: Signals and Systems I
2014-2018	Guest lecturer in E E 422: Communication Systems II, E E 523: Random Processes for Communications and Signal Processing, E E 622: Information Theory

Mentoring

Ph.D. students

Advising at Missouri S&T:

- Raja Sunkara
- Navid Seidi (co-advised with Sajal Das)

Committee member at Missouri S&T:

- Fred Love, Dissertation title "Intelligent Cyber-Physical System Security of Lab-On-Chip Medical Systems," graduated Spring 2022.
- Md Yasin Kabir, Dissertation title "Social Media Analytics with Applications in Disaster Management and Covid-19 Events," graduated Spring 2022.
- Mukund Telukunta
- Arindam Khanda
- Luke Smith
- Abhay Goyal
- Priyesh Ranjan

Mentoring as postdoctoral research associate at UW-Madison:

- Subhojyoti Mukherjee
- Blake Mason
- Sumeet Katariya

M.S. students

Advising at Missouri S&T:

- Shreen Gul

Committee member at Missouri S&T:

- Raja Sunkara, Thesis title "Computer Vision in Adverse Conditions: Small Objects, Low-Resolution Images, and Edge Deployment," graduated Spring 2023.
- Nikola Andric, Thesis title "Mat: Multi-Objective Adversarial Attack On Multi-Task Deep Neural Networks Based On Genetic Algorithms," graduated Spring 2023.
- Sree Pooja Akula, Thesis title "Dynamic Discounted Satisficing Based Driver Decision Prediction In Sequential Taxi Requests," graduated Spring 2023.
- Jack Manhardt
- Caleb Ross

Undergraduate students

- Lane Floyd, independent study, graduated Spring 2022.
- Decordre Johnson, intern in the Summer Engineering Research Academy program, 2022. [link]
- Joshua Caruso, Opportunities for Undergraduate Research Experience cohort, 2022-2024.

Professional Service

Area Chair Positions

2024 International Conference on Artificial Intelligence and Statistics (AISTATS)
2023 International Conference on Artificial Intelligence and Statistics (AISTATS)

Proposal Panelist

2023 National Science Foundation (NSF)

Reviewer

- AAAI Conference on Artificial Intelligence
- IEEE Communications Letters
- IEEE International Conference on Communications
- IEEE International Symposium on Information Theory (ISIT)
- IEEE Journal on Selected Areas in Information Theory
- IEEE Transactions on Communications
- IEEE Transactions on Dependable and Secure Computing
- IEEE Transactions on Information Forensics and Security
- IEEE Transactions on Information Theory
- IEEE Transactions on Signal and Image Processing over Networks
- IEEE Transactions on Signal Processing
- International Conference on Artificial Intelligence and Statistics (AISTATS)
- International Conference on Learned Representations (ICLR)
- International Conference on Machine Learning (ICML)
- Journal of Nonparametric Statistics
- Neural Information Processing Systems (NeurIPS)

Committee Position

2023-24 Student and Outreach Subcommittee, IEEE Information Theory Society

Other activities

2023 Panelist in the Resume Review event organized by ACM-Women student chapter, Missouri S&T
2021 Judge for the Council of Graduate Students poster competition, Missouri S&T
2018 Judge for the State Science and Technology Fair of Iowa, Iowa State University

Member

- Association for the Advancement of Artificial Intelligence (AAAI)
- Association for Computing Machinery (ACM)
- Institute of Electrical and Electronics Engineers (IEEE), IEEE Information Theory Society, IEEE Signal Processing Society
- National Institute of Standards and Technology (NIST) Generative AI - Public Working Group

University Service

At Missouri S&T

2023	Faculty Search Committee, ECE department search in AI
2022	Faculty Search Committee, CS department
06/22 - 05/23	Coordinator, CS department seminar series
2022	Faculty Search Committee, Tang Endowed Professorship in Cybersecurity
2022 - 24	Undergraduate Curriculum Committee, CS department
2022	Computer Science building upgrade subcommittee
2021 -	CS department liaison, Curtis Laws Wilson Library

At Iowa State University

2018	Founding Member of the Data Science Reading Group
2017	University Relations and Legislative Affairs Chair in the Graduate and Professional Student Senate
2016	Senator for Electrical and Computer Engineering in the Graduate and Professional Student Senate

Outreach

- **Instructor in Computer Science Pre-College Initiative, 2023.** Supervised a hands-on activity describing basic python programming to high school students from underrepresented communities. Event was organized by the Computer Science department in collaboration with the National Society of Black Engineers student chapter.
- **Instructor at the Jackling Introduction to Engineering Summer Camp 2021, 2022 and the Cyberminer Summer Camp 2022.** The Jackling Introduction to Engineering is a three-day summer camp for high school students interested in learning about science and engineering. Cyberminer is a one day summer camp for high school students interested in Computer Science. Both summer camps organized by the Kummer Center for STEM Education at Missouri S&T. Developed and supervised two suitable activities for students to complete in two three-hour lab sessions that introduced them to programming concepts and mathematical reasoning.
- **Organizer of Rolla NeurIPS Meetup 2021.** Organized an in-person and virtual four-day meetup for students, faculty, and public interested in current machine learning research. The meetup happened on the campus of Missouri S&T concurrently with the virtual 2021 Neural Information Processing Systems (NeurIPS) conference. It featured livestreams of keynote talks and oral presentations, followed by discussions among attendees.