Sanjukta Bhowmick

Associate Professor
Department of Computer Science and Engineering,
University of North Texas

Research Interests

My research is on modeling large-scale, dynamic complex systems as networks and analyzing these networks to study problems arising in applications including material science, cybersecurity, and ecology. My research involves developing scalable, resource-efficient algorithms for updating dynamic data, uncertainty quantification on noisy data, modeling multi-modal data, and predicting behavior of time-varying data.

Education

2004 **Ph.D. in Computer Science** Minor in High Performance Computing,
Department of Computer Science and Engineering.
Pennsylvania State University, University Park.
Thesis: Multimethod Solvers: Algorithms, Applications and Software.
Thesis Advisor: Dr. Padma Raghavan.

2000 **Bachelor of Technology (Honors)**, Computer Science and Engineering,
Haldia Institute of Technology, West Bengal, India.

Employment

Fall 2020-Present **Associate Professor**, Department of Computer Science and Engineering, University of North Texas (UNT)

2018-Summer 2020 **Visiting Research Associate Professor**, Department of Computer Science and Engineering, University of North Texas

2015-2018 **Associate Professor**, Department of Computer Science, University of Nebraska, Omaha

2016-2017 **Visiting Faculty** (on Sabbatical), Department of Computer Science and Engineering, University of North Texas

Jun-Aug 2014 **Visiting Faculty**, Air Force Research Laboratory.

2009-2015 **Assistant Professor**, Department of Computer Science, University of Nebraska, Omaha (UNO)

2007-2009 **Assistant Professor** (Fixed-Term), Department of Computer Science and Engineering, Pennsylvania State University, University Park. (Penn State)

2004-2007 **Postdoctoral Research Associate**, Joint Appointment at
(1) Department of Applied Physics and Applied Mathematics, Columbia University. Supervisor: Dr. David Keyes.
(2) Mathematics and Computer Science Department, Argonne National Laboratory. Supervisor: Dr. Paul Hovland.

2003 **Wallace Givens Research Associate**, Mathematics and Computer Science Department, Argonne National Laboratory.
Supervisors: Dr. Lois Curfman McInnes and Dr. Boyana Norris.

2001-2004 **Research Assistant**, Department of Computer Science and Engineering, Pennsylvania State University, University Park.
Supervisor: Dr. Padma Raghavan.

2000-2001 **Teaching Assistant**, Department of Computer Science and Engineering, Pennsylvania State University, University Park.

Research Funding

(Total Funding ≈ $6.1M; My share ≈ $1.3M)

2023-2026 **COS-CENG Seed Grant**	*GRAPH-N: Generating Rapid Applications for Predicting Heuristic Networks* co-PI in Seed Grant Total $10K
2023-2026 **NSF**	*LEGAS: Learning Evolving Graphs At Scale* PI in Collaborative Grant. Total $600K UNT Funds $308K.
2021-2024 **NSF**	*CANDY: Cyberinfrastructure for Accelerating Innovation of Network Dynamics* PI in Collaborative Grant. Total $1.5M. UNT Funds $449K.
2021-2024 **NSA**	*Privacy Preserving Analytics on a Data Cooperative for Comprehensive Threat Prevention* Co-PI (10% cost share) $750K
2021-2022**NSF**	*A Multilayer Network (MLN) CommunityInfrastructure for Data, Interaction,Visualization, and softwarE(MLN-DIVE)* PI in Collaborative Grant. Total $100K. UNT Funds $30K.
2020-2023 **NSA**	*Locating Super-Spreaders Through Partnership of Anonymization and Encryption* Co-PI (30% cost share) $299K
2020-2023 **NSF**	*NetSplicer: Scalable Decoupling-based Algorithms for Multilayer Network Analysis* PI in Collaborative Grant. Total $1M. UNT Funds $299K.
2018-2022 **NSF**	*ANACIN-X: Analysis and modeling of Nondeterminism and Associated Costs in eXtreme scale applications* PI in Collaborative Grant. Total $1M. UNT Funds $316K.
2017-2020 **NSF**	*SANDY: Sparsification-Based Approach for Analyzing Network Dynamics.* PI in Collaborative Grant. Total $700K. UNO/UNT Funds $225K
2015-2019 **NSF**	*Scalable Parallel Algorithms for Network Dynamics Analysis.* PI in Collaborative Grant. Total $299K. UNO/UNT Funds $146K.
2014-2014 **AFRL**	*Simulation Interface For Large-Scale Testing of UAV Flight Patterns.* PI. $9200
2014-2015 **UNO SPR**	*CONRAD: A Context-Aware Real Time Autonomous Decision Making System.* Joint PI. $34K
2014-2015 **HDR**	*Passively Cooled Data Centers.* Co-PI. $22K
2013-2014 **NASA Mini Grant**	*Multilevel Analysis of Streaming Heterogeneous Data.* PI. $1733.
2012-2013 **UNO SPR**	*Large-Scale Social Network Analysis Using Agent-based Pedestrian Crowd Models.* Co-PI. $10K.
2012-2016 **NSF**	*RET in Engineering and Computer Science Site on Infusing Mobile Platform Applied Research into Teaching.* Mentor. $499K.
2011-2013 **INBRE**	*IDeA Networks of Biomedical Research Excellence* Funded Fellowship for Summer Months
2011-2012 **UNO SPR**	*Modeling Change in Dynamic Networks.* PI. $24K
2010-2011 **Nebraska EPSCoR**	*Analyzing Evolution of Large-Scale Networks: Prediction, Updates and Response.* PI. $40K

Publications

Total Citations as of 3/12/2025 as per Google Scholar: 1276. h-index: 20; i-index:32

Journals (all peer reviewed)

1. S. Bhowmick, P. Bell, and M. Taufer, *A Survey of Graph Comparison Methods with Appli-*

cations to Nondeterminism in High-Performance Computing (IF 3.1) 2023.

2. A. Chowdhury, S. Srinivasan, A. Mukherjee, S. Bhowmick, and K. Ghosh, *Improving Node Classification Accuracy of GNN through Input and Output Intervention* ACM Transactions on Knowledge Discovery from Data (IF 4.1) 2023.

3. A. Santra, F. A. Irany, K. Madduri, S. Chakravarthy, and S. Bhowmick, *Efficient community detection in multilayer networks using boolean compositions*, Frontiers in Big Data (IF 3.1) 2023.

4. A. Khanda, S. Srinivasan, S. Bhowmick, B. Norris and S. K. Das, *A Parallel Algorithm Template for Updating Single-Source Shortest Paths in Large-Scale Dynamic Networks*, IEEE Transactions on Parallel and Distributed Systems (IF 4.3) 2022.

5. A. Chowdhury, S. Srinivasan, S. Bhowmick, A. Mukherjee, and K. Ghosh, *Constant community identification in million-scale networks*,Social Network Analysis and Mining (IF 3.8) 2022.

6. A. Santra, K. Komar, S. Bhowmick, and S. Chakravarthy, *From base data to knowledge discovery–A life cycle approach–Using multilayer networks*, Data & Knowledge Engineering (IF 1.99) 2022.

7. J. Wendt, C. Phillips, R. Field, A. Prasadan, S. Soundarajan, S. Bhowmick, and T. Wilson, *Partitioning Communication Streams into Graph Snapshots*, IEEE Transactions on Network Science and Engineering (IF 3.8) 2022.

8. P.Bell, K. Suarez, D. Chapp, N. Tran, S. Bhowmick and M. Taufer *ANACIN-X: A software framework for studying non-determinism in MPI applications*., Software Impacts (IF 1.8) 2021

9. D. Chapp, N. Tran, S. Bhowmick and M. Taufer *Identifying degree and sources of non-determinism in MPI applications via graph kernels.* IEEE Transactions on Parallel and Distributed Systems (IF 4.1) 2021

10. W. Qian, S. Bhowmick, M. O'Neill, S. Ramisetty-Mikler, and A. R. Mikler, *Applying a Probabilistic Infection Model for studying contagion processes in contact networks*, (IF 3.95) 2021

11. S. Srinivasan, S. Pollard, S. Das, B. Norris and S. Bhowmick, *A Shared-Memory Algorithm for Updating Trees-Based Structures in Dynamic Large-Scale Network.*, IEEE Transactions on Big Data (IF 1.60) 2018.

12. S. Sarkar, S. Sikdar, A. Mukherjee and S. Bhowmick, *Using Core-Periphery Structure to Predict High Centrality Nodes in Time-Varying Networks*, Data Mining and Knowledge Discovery(DMKD),(IF 3.16) 2018

13. T. Chakraborty, S. Kumar, N. Ganguly, A. Mukherjee and S. Bhowmick, *GenPerm: A Unified Method for Detecting Non-overlapping and Overlapping Communities.* IEEE Transactions on Knowledge and Data Engineering (TKDE) (IF 2.067) 2016

14. T. Chakraborty, S. Srinivasan, N. Ganguly, A. Mukherjee and S. Bhowmick, *Permanence and Community Structure in Complex Networks.* ACM Transactions on Knowledge Discovery from Data (TKDD) (IF 1.00) 2016
    Listed in Notable Books and Articles of 2016 by ACM Computing Reviews
    Part of NetworKit package `https://networkit.iti.kit.edu/api/centrality.html`

15. P. Meyer, H. Siy and S. Bhowmick, *Identifying Key Components of Software Using K-Cores.* Advances in Complex Systems (IF .46) 2015

16. S. Bhowmick, T.-Y. Chen and M. Hallapanavar, *A New Augmentation-Based Method For Extracting Maximal Chordal Graphs.* Journal of Parallel and Distributed Computing (IF 1.233) 2014

17. N. Hemmatazad, Q. Zhu, R. Gandhi and S. Bhowmick, *The Intelligent Data Brokerage: A Utility-Enhancing Architecture for Algorithmic Anonymity Measures.* International Journal of Privacy and Health Information Management 2014

18. K. Dempsey, V. Ufimtsev, S. Bhowmick, H. Ali, *A Parallel Template for Implementing Filters for Biological Correlation Networks.* International Journal of Computing 2014

19. T. Chakraborty, S. Srinivasan, N. Ganguly, S. Bhowmick, A. Mukherjee, *Constant Communities in Complex Networks.* Nature Scientific Reports (IF 5.078) 2013

20. S. Bhowmick, E. Boman, K. Devine, A. Gebremedhin, B. Hendrickson, P. Hovland, T. Munson and A. Pothen, *Combinatorial Algorithms Enabling Computational Science: Tales From the Front.* Journal of Physics: Conference Series, 2006.

21. P. Hovland, B. Norris, M. Strout, S. Bhowmick and J. Utke, *Sensitivity Ananlysis and Design Optimization through Automatic Differentiation.* Journal of Physics: Conference Series, 2005.

22. S. Bhowmick, P. Raghavan, L. C. McInnes and B. Norris, *Faster PDE-based Simulations using Robust Composite Linear Solvers,* Future Generation Computer Systems. (IF 2.459) 2004.

Book Chapters (all peer reviewed)

23. S. Sarakar, A. Karn, Bhowmick and A. Mukherjee, *An Empirical Study of the Effect of Noise-Models on Centrality Metrics*, Dynamics On and Of Complex Networks III (Eds. Fakhteh Ghanbarnejad, Bivas Mitra, Fariba Karimi, Rishiraj Saha Roy, Jean-Charles Delvenne), Springer,2018

24. S. Sarkar, S. Kumar, S. Bhowmick, A. Mukherjee, *Centrality and Community Scoring Functions in Incomplete Networks: Their Sensitivity, Robustness and Reliability.* Machine Learning Techniques for Online Social Networks, Springer. 2017

25. S. Bhowmick and S. Srinivasan, *A Template for Parallelizing the Louvain Method.* Time Varying Dynamic Networks, (Eds. N. Ganguly, A. Mukherjee, M. Choudhury, F. Peruani, and B. Mitra), Birkhauser, Springer,2012

26. S. Srinivasan, T. Chakraborty and S. Bhowmick, *Identifying Base Clusters And Their Application To Maximizing Modularity.* Contemporary Mathematics. Graph Partitioning and Graph Clustering (Eds. D. A. Bader, H. Meyerhenke, P. Sanders and D. Wagner), AMS-DIMACS, 2012

27. A. Chaterjee, S. Bhowmick and P. Raghavan, *Improving Classification Through Graph Embedding, Graph Embedding for Pattern Analysis.* Editor, Raymond Fu, Springer, 2012.

28. S. Bhowmick, V. Eijkhout, Y. Freund, E. Fuentes and D. Keyes, *Application of Alternating Decision Trees in Selecting Sparse Linear Solvers.* Software Automatic Tuning: from concepts to state-of-the-art results, Editors K. Teranishi, J. Cavazos, K. Naono and R. Suda, Springer, 2010.

Conference and Workshops (all peer reviewed)

29. A. Shinde, V. Sabhaya, K. Farokhrouz, F. Irany, A. Khan, S. Bhowmick, A. Santra, and S. Chakravarthy, *MLN-geeWhiz: Supporting Complex Data Analysis Including Visualization* 12th International Conference on Big Data and Artificial Intelligence (BDA), 2024.

30. S. Srinivasan, A. Khanda, S. Srinivasan, A. Pandey, S. K. Das, S. Bhowmick, and B Norris *A Distributed Algorithm for Identifying Strongly Connected Components on Incremental Graphs* IEEE 35th International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD), 2023 (acceptance rate $\approx$ 35%).

31. N. Tan, J. Luettgau, J. Marquez, K. Teranishi, N. Morales, S. Bhowmick, F. Cappello, M. Taufer, and B. Nicolae, *Scalable Incremental Checkpointing using GPU-Accelerated De-Duplication* International Conference on Parallel Processing 2023 (acceptance rate $\approx$ 31%).

32. P. Bell, K. Suarez, B. Fossum, D. Chapp, S. Bhowmick, and M. Taufer, *A Research-Based Course Module to Study Non-determinism in High Performance Applications* IEEE International Parallel and Distributed Processing Symposium Workshops 2022.

33. A. Khanda, S. Bhowmick, X. Liang, and S. Das,*Parallel Vertex Coloring on Large Dynamic Networks*, International Conference on High-Performance Computing, Data, and Analytics (HiPC) 2022. **shortlisted for Best Paper** (acceptance rate $\approx$ 23%).

34. A. Chowdhury, S. Srinivasan, K. Ghosh, S. Bhowmick and A. Mukherjee. *Constant community identification in million scale networks using image thresholding algorithms*. Proceedings of the 2021 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining ASONAM 2021 (acceptance rate $\approx$ 19%).

35. M. Dockendorf, R. P. Dantu, K. Morozov, and S. Bhowmick, *nvesting Data with Untrusted Parties using HE* , SECRYPT 2021.

36. K. S. Komar, A. Santra, S. Bhowmick, and S. Chakravarthy *EER MLN: EER Approach for Modeling, Mapping, and Analyzing Complex Data Using Multilayer Networks (MLNs)*. Conceptual Modeling: 39th International Conference, ER 2020.

37. W. Gasper, K. Cooper, N. Cornelius, S. Bhowmick and H. Ali.*haracterization of S. cerevisiae Protein Complexes by Representative DDI Graph Planarity.* The 11th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics ACM-BCB 2020 (acceptance rate $\approx$ 29%).

38. K. Cooper, N. Cornelius, W. Gasper, S. Bhowmick and H. Ali. *On the Planarity of Validated Complexes of Model Organisms in Protein-Protein Interaction Networks.* International Conference on Computational Science ICCS 2020 (acceptance rate $\approx$ 30%).

39. W. Qian, S. Bhowmick, M. O'Neill, S. Ramisetty-Mikler, and A. Mikler, *A Probabilistic Infection Model for Efficient Trace-Prediction of Disease Outbreaks in Contact Networks* International Conference on Computational Science ICCS 2020 **Best Paper** (acceptance rate $\approx$ 30%).

40. S. Riazi, S. Srinivasan, S. Das, S. Bhowmick and B. Norris *Single-Source Shortest Path Tree For Big Dynamic Graphs* Fifth International Workshop on High Performance Big Graph Data Management, Analysis, and Mining 2018.

41. S. Srinivasan, S. Riazi, S. Das, B. Norris and S. Bhowmick, *A Shared-Memory Parallel Algorithm for Updating Single-Source Shortest Paths in Weighted Dynamic Networks.* IEEE International Conference on High Performance Computing, Data and Analytics. HiPC 2018 (acceptance rate 22%).

42. S. Sarkar, A. Mukherjee, and S. Bhowmick. *On Rich Clubs of Path Based Centralities in Networks.* ACM International Conference on Information and Knowledge Management. CIKM 2018 (acceptance rate 17%)

43. A. Santra and S. Bhowmick, *Holistic Analysis of Multi-Source, Multi-Feature Data: Modeling and Computation Challenges.* International Conference on Big Data Analytics 2017 (acceptance rate 12%).

44. A. Santra, S. Bhowmick, S. Chakravarthy, *HUBify: Efficient Estimation of Central Entities across Multiplex Layer Compositions.* Workshop on Data Mining in Networks (DaMNet). ICDM 2017.

45. A. Santra, S. Bhowmick, S. Chakravarthy, *Efficient Community Recreation in Multilayer Networks Using Boolean Operations*. International Conference on Computational Science ICCS 2017 (acceptance rate 30%).

46. K. Cooper, H. Ali and S. Bhowmick, *An Iterative Graph-Theoretic Approach for Filtering Noisy Relationships in Correlation Networks*. Workshop on Inferring Networks from Non-Network Data. SDM 2017.

47. S. Sarkar, S. K. Kumar, A. Mukherjee, and S. Bhowmick. *Sensitivity and reliability in incomplete networks: Centrality metrics to community scoring functions*. Advances in Social Network Analysis and Mining (ASONAM), 2016 (acceptance rate 13%).

48. V. Ufimtsev, S. Sarkar, A. Mukherjee, and S. Bhowmick. *Understanding stability of noisy networks through centrality measures and local connections*. ACM International Conference on Information and Knowledge Management (CIKM) 2016 (acceptance rate 28%).

49. M. Parsinia, Q. Peng, S. Kumar and S. Bhowmick. *Gender Assignment for Directional Full-Duplex FDD Nodes in a Multihop Wireless Network*. EAI International Conference on Ad Hoc Networks (AdHocNets) 2016.

50. S. Srinivasan, S. Bhowmick, and S. Das. *Application of graph sparsification in developing parallel algorithms for updating connected components*. Graph Algorithm Building Blocks Workshop Intl.Parallel and Distr. Processing Symposium (IPDPS) 2016.

51. T. Chakraborty, S. Srinivasan, N. Ganguly, A. Mukherjee and S. Bhowmick, *On the Permanence of Vertices in Network Communities*. ACM SIGKDD international Conference on Knowledge Discovery and Data Mining (KDD) 2014. (acceptance rate 14%) **Video available at:** `http://videolectures.net/kdd2014_chakraborty_network_communities`

52. V. Ufimtsev, S. Rajamanickam and S. Bhowmick, *Building Blocks for Graph-Based Network Ananlysis*. IEEE High Performance Extreme Computing Conference 2014.

53. V. Ufimtsev and S. Bhowmick, *An Extremely Fast Algorithm for Computing Closeness Centrality of Large-Scale Networks*. Workshop on Irregular Applications: Architectures and Algorithms, Supercomputing 2014.

54. P. Dasgupta and S. Bhowmick, *Towards Context-Aware, Real Time and Autonomous Decision Making Using Information Aggregation and Network Analytics*. International Conference on Semantic Technology For Intelligence, Defense and Security STIDS 2013.

55. V. Ufimtsev and S. Bhowmick, *Application of Group Testing in Identifying High Betweenness Centrality Vertices in Complex Networks*. Workshop on Machine Learning with Graphs, KDD 2013.

56. S. West, K. Dempsey, S. Bhowmick and H. Ali, *Analysis of Incrementally Generated Clusters in Biological Networks Using Graph-Theoretic Filters and Ontology Enrichment*. Workshop on Incremental Clustering, Concept Drift and Novelty Detection, ICDM 2013.

57. K. Dempsey, T.-Y. Chen, S. Srinivasan, S. Bhowmick and H. Ali, *A Structure-Preserving Hybrid Chordal-Filter for Sampling in Correlation Networks*. High Performance Computing and Simulation. HPCS 2013.

58. M. Halappanavar, K. Dempsey, H. Ali, J. Feo and S. Bhowmick, *A Novel Multithreaded Algorithm For Extracting Maximal Chordal Subgraphs*. International Conference on Parallel Processing (ICPP), 2012 (acceptance rate 28%)

59. K. Dempsey, T.-Y. Chen, S. Bhowmick and H. Ali, *On the Design of Advanced Filters for Biological Networks using Graph Theoretic Properties*. International Conference on Bioinformatics and Biomedicine (BIBM), 2012 (acceptance rate 20%).

60. I. Thapa, S. Bhowmick and D. Bastola, *A Comparison of Computational Approaches in the Molecular Identification of Pathogenic Organisms*. IEEE Conference on Healthcare

Informatics, Imaging, and Systems Biology (HISB), 2012.

61. K. Dempsey, S. Bhowmick and H. Ali, *Function-preserving Filters for Sampling in Biological Networks*. Proceedings of the International Conference on Computational Science (ICCS), 2012 (acceptance rate 30%).

62. K. Dempsey, K. Duraisamy, H. Ali and S. Bhowmick, *The Development of Parallel Adaptive Sampling Algorithms for Analyzing Biological Networks*. International Workshop on High Performance Computational Biology, IPDPSW 2012.

63. P. Paymal, R. Patil, S. Bhowmick and H. Siy, *Measuring Disruption From Software Evolution Activities Using Graph-Based Metrics*. IEEE International Conference on Software Maintenance (ICSM) (ERA Track), 2011.

64. K. Dempsey, K. Duraisamy, H. Ali and S. Bhowmick, *A Parallel Graph Sampling Algorithm for Analyzing Gene Correlation Networks*. Proceedings of the International Conference on Computational Science(ICCS), 2011 (acceptance rate 30%)

65. K. Duraisamy, K. Dempsey, H. Ali and S. Bhowmick, *A Noise Reducing Sampling Approach for Uncovering Critical Properties in Large Scale Biological Networks*. Proceedings of the International Conference on High Performance Computing and Simulation (BILIS workshop) 2011.

66. S. Bansal, S. Bhowmick and P. Paymal, *Fast Community Detection For Dynamic Complex Networks*. Communications in Computer and Information Science, CompleNet 2010.

67. A. Chatterjee, S. Bhowmick and P. Raghavan, *Feature Subspace Transformations for Enhancing K-Means Clustering*. ACM International Conference on Information and Knowledge Management (CIKM), 2010.

68. S. Bhowmick and S. Shontz, *Towards High Quality, Untangled Meshes via a Force-Directed Graph Embedding Approach*. International Conference on Computational Science, (ICCS), 2010 (acceptance rate 30%).

69. S. Bhowmick, M. Shafiullah, H. Rai and D. Bastola, *A Parallel Non-Alignment Based Approach to Efficient Sequence Comparison using Longest Common Subsequences*. High Performance Computing Symposium, 2010.

70. S. Bhowmick, B. Toth and P. Raghavan, *Towards Low-Cost and High-Efficiency Classifiers for Linear Solver Selection*. International Conference on Computational Science: (ICCS) 2009. (acceptance rate 30%).

71. A. Chatterjee, S. Bhowmick, and P. Raghavan, *FAST: Force direct Approximate Subspace Transformation for Improved Unsupervised Document Classification*. SIAM Text Mining Workshop, SDM, 2008.

72. S. Bhowmick and P. D. Hovland, *Improving the Performance of Graph Coloring Algorithms through Backtracking*. International Conference on Computational Science: (ICCS) 2008. (acceptance rate 30%).

73. S. Bhowmick and P. D. Hovland, *A Polynomial-Time Algorithm for Detecting Directed Axial Symmetry in Hessian Computational Graphs*. Advances in Automatic Differentiation Series: Lecture Notes in Computational Science and Engineering, 2008.

74. B. Norris, L. McInnes, S. Bhowmick and L. Li, *Adaptive Numerical Components for PDE-Based Simulations*. ICIAM, Applied Mathematics and Mechanics, 2007.

75. B. Norris, S. Bhowmick, D. Kaushik and L. C. McInnes, *Middleware for Dynamic Adaptation of Component Applications*. International Federation for Information Processing, 2007.

76. S. Bhowmick, D. Kaushik, L. McInnes, B. Norris and P. Raghavan, *Parallel Adaptive Solvers in Compressible PETSc-FUN3D Simulations*. Parallel Computational Fluid Dynamics: Theory and Applications, 2005.

77. S. Bhowmick, L. McInnes, B. Norris and P. Raghavan, *Robust Algorithms and Software for arallel PDE-Based Simulations*. Twelfth Special Symposium on High Performance Computing, 2004.

78. L. McInnes, B. Norris, S. Bhowmick and P. Raghavan, *Adaptive Sparse Linear Solvers for Implicit CFD Using Newton-Krylov Algorithms*. Second MIT Conference on Computational Fluid and Solid Mechanics, Editor K. J. Bathe, 2003.

79. S. Bhowmick, L. C. McInnes, B. Norris and P. Raghavan, *The Role of Multi-Method Solvers in PDE-Based Simulations*. International Conference on Computational Science 2003.

80. S. Bhowmick, P. Raghavan and K. Teranishi, *A Combinatorial Scheme for Developing Efficient Composite Solvers*. Proceedings of the International Conference on Computational Science 2002.

Other Publications (non peer reviewed)

81. K. K. Kethineni, S. P. Mohanty, E. Kougianos, S. Bhowmick, and L. Rachakonda, *SprayCraft: Graph-Based Route Optimization for Variable Rate Precision Spraying*, arXiv:2412.12176

82. J. Kepner, S. Bhowmick, A. Buluç, R. Caceres, J. Crouser, V. Gadepally, B. Miller, and J. Webster, *Data Mining "Brings It" to SIAM Annual Meeting*. SIAM News February 2017.

83. S. Bhowmick, *Application of Graph Theoretic Techniques for Reliable and Efficient Mobile Communication Networks*. Project Report for AFRL 2014.

84. J. W. Berry, V. J. Leung, C. A. Phillips, A. Pinar, D. G. Robinson, T. Berger-Wolf, S. Bhowmick, E. Casleton, M. Kaiser, D. Nordman, A. G. Wilson, *Statistically Significant Relational Data Mining*. LDRD Report 2014.

85. S. Bhowmick and P. Hovland, *A Polynomial Time Algorithm for Detection of Axial Symmetry in Directed Acyclic Graphs*. Preprint ANL/MCS-P1314-0106.

Presentations

Invited Presentations

1. *The Illusory Promise of Graph Foundation Models*. Workshop on Clusters, Clouds, and Data for Scientific Computing. 2024.
2. *Analysis of Dynamic Networks with CANDY.* SIAM Conference on Parallel Processing. 2024.
3. *Network Analysis in the Era of Inexactness* Workshop on Clusters, Clouds, and Data for Scientific Computing. 2022.
4. *Reliability and Reproducibility of Network Analysis*. NSF Cyberinfrastructure for Sustained Scientific Innovation Workshop. 2019.
5. *Parallel Algorithms for Dynamic Networks* Scheduling for Large Scale Systems Workshop, Bordeaux. 2019.
6. *Parallel Algorithms for Updating Large Weighted Dynamic Networks*. Scheduling for Large Scale Systems Workshop, Lawrence Berkeley National Laboratory. 2018.
7. *Noise and Dynamics in High Expansion Networks* Graph Exploitation Symposium, MIT Lincoln Laboratory. 2018.
8. *How Network Structure Affects Its Stability.* Dynamics on and of Complex Networks X, Satellite Workshop NetSci. 2017.
9. *Permanence: A Vertex Centric Approach to Evaluating Accuracy of Communities*. Graph Exploitation Symposium, MIT Lincoln Laboratory 2015.

10. *Towards Accurate Analysis of Noisy Data*. Department of Computer Science. University of Texas, Arlington 2014.
11. *Those Little Problems of Big Data*. Department of Environmental Sciences. University of North Texas 2013.
12. *A Network Analysis Perspective of Software Evolution*. Networks Over Time Workshop. International School and Conference on Network Science 2013.
13. *Noise in Networks*. Graph Exploitation Symposium, MIT Lincoln Laboratory. 2013.
14. *Adaptive Algorithms for Network Analysis*. INAOE, Mexico. 2012.
15. *On the Stability of Network Analysis* ICiS Workshop on Graph and Hypergraph Problems in Computational Science: Applications and Algorithms, 2012.
16. *Evaluating the Effect of Noise in Complex Networks*. Mathematics Department. Southern Methodist University, 2012.
17. *On the Stability of Network Analysis Algorithms*. Dynamics on and of Complex Networks V, Satellite Workshop European Conference on Complex Systems, 2011.
18. *Analyzing Noisy Networks*. CSE Seminar, IIT Kharagpur, India, 2011.
19. *Challenges in Analyzing Large Dynamic Networks*. Argonne National Laboratory, 2011.
20. *Novel Applications of Graph Embedding*. Computational Science and Engineering Seminar, Georgia Institute of Technology, 2010.
    Video available at: `http://smartech.gatech.edu/handle/1853/35239`.
21. *Blurring Boundaries-The Changing Face of Computer Science*. Scientific Computing Seminar, University of California, Davis, 2008.
22. *The Potential of Machine Learning Algorithms in Scientific Computing*. Scientific Computing Seminar, Lawrence Berkeley National Laboratory, 2008.
23. *Polynomial Time Symmetry Detection Algorithm For Improving Hessian Computation*. CSAIL Seminar, MIT, 2008.
24. *Application of Machine Learning for Solver Selection*. CScADS Workshop on Libraries and Algorithms for Petascale Applications, 2007.
25. *The Synergy of Scientific Computing and Computer Science*. Seminar, The Institute of Mathematical Sciences, Chennai, India, 2006.
26. *Selecting and Combining Solvers-A Multimethod Approach to Solving Linear Systems*. CPPG Group Seminar, Princeton Plasma Physics Laboratory, 2006.

Peer Reviewed Abstracts (To avoid repetition, presentations of conference and workshop papers are not listed.)

27. J. Marquez, B. Bogale, A. Pandey, N. Tan, L. Whitnah, S. Bhowmick, M. Taufer *Teaching Non-determinism in High Performance Applications*. EduPAr SC'23 Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis.
28. S. Bhowmick, S. Srinivasan, B. Norris and S. Das, *Parallel Algorithms for Dynamic Networks*. SIAM Conference on Computational Science and Engineering 2019.
29. C. White, A. Mikler and S. Bhowmick, *A Network-Based Model of Exposure Risk Among University Students*. Conference on Complex Systems 2017.
30. S. Bhowmick, S. Srinivasan and S. Das, *Updating Dynamic Networks in Parallel Using Graph Sparsification*. SIAM Conference on Computational Science and Engineering 2017.

31. S. Bhowmick and S. Srinivasan, *Predicting Movement of Vertices Across Communities in Dynamic Networks*. SIAM Conference on Computational Science and Engineering 2017.
32. S. Bhowmick, A. Mukherjee and S. Srinivasan, *Finding Reliable Communities in Complex Networks*. SIAM Annual Meeting 2016.
33. S. Bhowmick, S. Das and S. Srinivasan, *Parallel Algorithms for Analyzing Dynamic Networks*. SIAM Conference on Parallel Processing and Scientific Computing 2015.
34. S. Bhowmick and B. Norris, *Performance and Power Characterization of Network Algorithms*. SIAM Conference on Parallel Processing and Scientific Computing 2015.
35. S. Bhowmick and V. Ufimtsev, *Finding High Betweenness Centrality Vertices in Large Networks*. SIAM Workshop on Combinatorial Scientific Computing 2014
36. S. Bhowmick and V. Thotakuri, *Analyzing Shakespeare's Dramas Using Networks*. SIAM Conference on Parallel Processing and Scientific Computing 2014.
37. S. Bhowmick, *Application-Agnostic Validation Metrics for Network Analysis Algorithms*. Social Dynamics Workshop. International School and Conference on Network Science 2013.
38. S. Bhowmick and V. Ufimtsev, *Effect of Network Perturbation on Betweenness Centrality*. Siam Workshop on Network Science. 2013.
39. S. Bhowmick, S. Srinivasan and V. Ufimtsev, *Evaluating Noise in Complex Networks*. SIAM Conference on Computational Science and Engineering, 2013.
40. S. Bhowmick and T.-Y. Chen,*Application of Graph Scaffolding in Approximating the Chromatic Number*. SIAM Annual Meeting, 2012.
41. S. Srinivasan, and S. Bhowmick, *Using Stable Communities for Modularity Maximization*. DIMACS Challenge Workshop, 2012.
42. S. Bhowmick and K. Duraisamy, *Adaptive Sampling for Improving the Results of Dynamic Network Analysis*. SIAM Conference on Parallel Processing, 2012.
43. N. Chinni and S. Bhowmick, *Implementing Network Analysis on GPUs*. SIAM Conference on Parallel Processing, 2012.
44. T.-Y. Chen, S. Bhowmick, K. Duraisamy and L. Peairs, *Chordal Graph Preconditioners for Sparse Linear Systems*. ICIAM, 2011.
45. S. Bhowmick, T.-Y. Chen, K. Duraisamy and L. Peairs, *Chordal Graph Preconditioners for Solving Large Sparse Linear Systems*. SIAM Conference on Computational Science and Engineering, 2011.
46. S. Bhowmick and P. Paymal, *Application of Datamining in Analyzing Large-Scale Network Evolution*. SIAM Annual Meeting, 2010.
47. S. Bhowmick, B. Toth, and P. Raghavan, *Cost Efficient Classifiers for Sparse Linear Solver Selection*. SIAM Conference on Parallel Processing for Scientific Computing, 2010.
48. S. Bhowmick, D. Bastola, S. Surapaneni, and H. Ali, *Fast and Scalable Algorithms for Comparing Genetic Sequences*. SIAM Conference on Parallel Processing, 2010.
49. S. Bhowmick, S. Bansal, K. Fermoyle and P. Raghavan, *Detecting Communities in Dynamic Networks*. SIAM Annual Meeting, 2009.
50. S. Bhowmick, A. Chatterjee, and P. Raghavan, *Utilizing Sparsity Patterns in SVM Kernels*. SIAM Conference on Computational Science and Engineering, 2009.
51. S. Bhowmick and P. D. Hovland, *A Backtracking Heuristic for Graph Coloring*. SIAM Conference on Optimization, 2008.

52. S. Bhowmick, *Issues in Exploiting the Power of Multiple Methods*. SIAM Conference on Parallel Processing for Scientific Computing, 2008.
53. S. Bhowmick and P. Hovland,*A Polynomial Time Algorithm for Detection of Axial Symmetry in Hessian Computational Graphs*. SIAM Workshop on Combinatorial Scientific Computing, 2007.
54. S. Bhowmick, *The Synergy of Computer Science and Scientific Computing*. SIAM Conference on Computational Science and Engineering, 2007.
55. S. Bhowmick, D. Keyes, Y. Freund, V. Eijkhout and E. Fuentes, *Application of Machine Learning to Selecting Solvers for Sparse Linear Systems*. SIAM Conference on Parallel Processing for Scientific Computing, 2006.
56. S. Bhowmick and P. Hovland, *A Backtracking Correction Heuristic for Improving Performance of Graph Coloring Algorithms*. Second International Workshop on Combinatorial Scientific Computing, 2005.
57. S. Bhowmick, L. C. McInnes, B. Norris and P. Raghavan, *Combinatorial Schemes for Developing Composite and Adaptive Solvers*. Eleventh SIAM Conference on Parallel Processing for Scientific Computing, 2004.
58. S. Bhowmick. P. Raghavan and K. Teranishi, *A New Scheme for Developing Composite Solvers*. SIAM Annual Meeting, 2002.

Posters

1. A. Pandey, A. Khanda, S. M. Shovan,F. Hosseini, S. Das, B. Norris, and S. Bhowmick, *Efficient Approaches to Analyzing Large Dynamic Networks* The International Conference for High Performance Computing, Networking, Storage, and Analysis (Supercomputing) 2024.
2. A. Pandey, A. Khanda, S. Srinivasan, S. Srinivasan, S. M. Shovan,F. Hosseini, S. Das, B. Norris, and S. Bhowmick, *Scalable Algorithms for Analyzing Large Dynamic Networks Using CANDY* The International Conference for High Performance Computing, Networking, Storage, and Analysis (Supercomputing) 2023.
3. A. Pandey, S. Bhowmick, A. Khanda, S. Das, S. Srinivasan, and B. Norris, *CANDY: An Efficient Framework for Updating Properties on Large Scale Dynamic Networks*. The International Conference for High Performance Computing, Networking, Storage, and Analysis (Supercomputing) 2022.
4. S. Bhowmick, S. Srinivasan, B. Norris, S. Riazi and S. Das, *Parallel Algorithms for Updating Tree Like Properties of Dynamic Graphs*. NimBios HPC Workshop 2019.
5. S. Bhowmick, S. Sarkar, S. Sikdar and A. Mukherjee, *Predicting High Centrality Vertices in Time Varying Networks*. SIAM Workshop on Network Science 2017.
6. V. Ufimtsev, S. Bhowmick, S. Sarkar, and A. Mukherjee, *Identifying Stable Networks*. SIAM Workshop on Network Science 2016.
7. V. Ufimtsev, T. Chakraborty, S. Kumar, A.Mukherjee and N. Ganguly, *The Effect of Noise in Networks Communities*. SIAM Workshop on Network Science 2015.
8. S. Bhowmick, *The Effect of Noise in Community Detection*. SIAM Workshop on Network Science 2014.
9. S. Bhowmick, *Creating Meaningful Network Models From Sociological and Biological Data*. NetSci 2014.
10. S. Bhowmick and V. Thotakuri, *Analyzing Shakespeare's Plays Using Networks*. SIAM Workshop on Network Science. 2013.

11. S. Bhowmick and S. Shontz, *Obtaining High-Quality Untangled Meshes Through Force-Directed Graph Embedding*. SIAM Workshop on Combinatorial Scientific Computing, 2009.
12. V. Bui, B. Norris, S. Bhowmick, L. Li and L. C. McInnes, *Towards the Dynamic Selection of Parallel Linear Solvers Based on Performance and Power Considerations*. SIAM Conference on Parallel Processing for Scientific Computing, 2008.
13. S. Bhowmick, D. Keyes, Y. Freund, V. Eijkhout and E. Fuentes, *Implementing Machine Learning for Solver Selection*. SIAM Conference on Computational Science and Engineering 2007.
14. S. Bhowmick, P. Raghavan, L. C. McInnes, and B. Norris, *Improving the Performance of PDE-Based Simulations by Using Multimethod Solvers*. SIAM Conference on Computational Science and Engineering, 2003.
15. S. Bhowmick, P. Raghvan, L. C. McInnes, and B. Norris, *Robust Sparse Linear Solvers*. International Conference on Preconditioning Techniques for Large Scale Sparse Matrix Problems In Scientific and Industrial Applications, 2003.

Posters and Presentations by Students

1. A. Pandey *Scalable Algorithm for Strongly Connected Component Updates in Large Dynamic Graphs* Presentation at SIAM CSE 2025.
2. A. Khan *Scalable Motifs on Large-Scale Dynamic Graphs* Presentation at SIAM CSE 2025.
3. T. Kundu *A Study on the Effect of Graph Structure Versus Feature Quality for GCN* Poster at SIAM CSE 2025.
4. D. Pandey *Identifying Regions of Non-Determinism in HPC Simulations Through Event Graph Alignment* ACM Undergraduate Research Competition Poster Supercomputing, 2024. **Semifinalist Candidate**.
5. A. Khan. *Scalable Motif Counting in Large Dynamic Graphs*. . ACM Student Research Competition Poster Supercomputing, 2024.
6. A. Khan. *Towards Scalable Identification of Motifs Representing Non-Determinism in HPC Simulations*. . ACM Student Research Competition Poster Supercomputing, 2022.
7. S. Srinivasan. *A Graph Sparsification Based Approach for Updating Large Dynamic Networks*. Poster at Ph.D. Forum. IPDPS 2017, 2018.
8. S. Srinivasan. *Parallel Algorithms for Updating Large Dynamic Networks Using Graph Sparsification*. ACM Student Research Competition Poster Supercomputing, 2016. **Semifinalist Candidate**
9. S. Ahmed. *Adaptive Sampling For Large Scale Networks*. Poster at SIAM Conferences on Parallel Processing and Scientific Computing 2014.
10. S. Srinivasan. *Detecting And Using Stable Communities For Modularity Maximization*. Poster at SIAM Annual Meeting, 2012.
11. V. Ufimtsev. *A Scalable Group Testing Based Algorithm for Finding d-highest Betweenness Centrality Vertices in Large Scale Networks*. ACM Student Research Competition Poster Supercomputing, 2011. **First place in competition**.
12. K. Dempsey. *A Parallel Chordal Graph Algorithm for Analyzing Biological Network Models*. Poster at SIAM Conference on Computational Science and Engineering, 2011.
13. K. Duraisamy. *An Efficient Algorithm for Obtaining Low Memory Approximation Models of Large-Scale Networks*. ACM Student Research Competition Poster Supercomputing, 2010. **Third place in competition**.

Awards and Nominations

Program Director SIAM Activity Group in Supercomputing	Nominated 2019.
Secretary SIAM Activity Group in Supercomputing	Nominated 2017.
SIGHPC Emerging Woman Leader in Technical Computing	Nominated 2017.
SIAM Travel Award	SIAM Conference on Computational Science and Engineering 2009. SIAM Conference on Parallel Processing 2008. SIAM Workshop on Combinatorial Scientific Computing 2007. SIAM Annual Meeting 2002.
CSE Best Research Assistant	Department of Computer Science and Engineering, The Pennsylvania State University 2004.
Wallace Givens Fellowship	Mathematics and Computer Science Department, Argonne National Laboratory 2003.
First Position in B.Tech Hons	Computer Science. Haldia Institute of Technology, Vidyasagar University, India 2000.
National Scholarship	Achievement in Higher Secondary Examination, West Bengal Higher Secondary Education Board, India. 1996.

Teaching

Spring 2023	Graph Neural Networks. Special Topics Course.
Spring 2022-2025	Graph Theory. Graduate Course.
Spring 2022, Fall 2022-2025	Algorithms. Graduate Course.
Fall 2016-2020, Spring 2018-2021 Summer 2018	Algorithms. Undergraduate Course.
Summer 2016	Foundations of Computer Science. Undergraduate Course.
Spring 2012-2014,2016, 2018,2019,2021	Analysis of Large Networks. Undergraduate Course in 2012. Graduate Course from 2013-2018 Special Topics Course (Graduate) in 2019,2021.
Fall 2007-2014, 2018	Parallel Programming.
Spring 2010, Summer 2010	Undergraduate Course in 2007-2008. Graduate+ Undergraduate Course 2009-2018.
Spring 2014-2016	Advanced Computer Architecture. Graduate Course.
Spring 2010-2013, Fall 2012	Datastructures. Undergraduate Course.
Spring 2011, Fall 2011, 2013, 2014	Theory of Computing. Undergraduate Course.
Fall 2007-2008	Numerical Analysis. Undergraduate Course.
Spring 2008-2009	Programming with MATLAB. Undergraduate Course for non-CS majors.

Student Supervision

Doctoral Students(6 in program)(2 graduated)

1. Dhroov Pandey *Dynamic Graph Decomposition* Anticipated Graduation in 2029.
2. Soumendra Banerjee *Practical Algorithms for Perfect Graphs* Anticipated Graduation in 2029.
3. Turja Kundu *Improving Deep Learning in Dynamic Graphs* Anticipated Graduation in 2028.
4. Gayani Gupta *Large Scale Graph Anonymization.* Anticipated Graduation in 2027.

5. Ali Yar Khan *Motif Finding in Large Dynamic Graphs.* Anticipated Graduation in 2026.
6. Farahnaz Hosseini *Adaptive Dynamic Algorithms.* Anticipated Graduation in 2026.
7. Aashish Pandey *Deep Learning for Graph Algorithms.* Anticipated Graduation in 2025.
8. Fariba Afrin Irany *Algorithms for Multilayer Networks.* Graduated in 2024.
9. Sriram Srinivasan *Parallel Algorithms for Dynamic Networks.* Graduated in 2020.(Assistant Professor at Bowie State University).
10. Vladimir Ufimtsev *Fast and Accurate Analysis of Noisy Networks.* Graduated 2016. (Assistant Professor at East Central University).

Masters Students

1. L. Velkuri *Multilayer Network Analysis.* 2019.
2. V. Padam *Modeling Temporal Changes in Context-Based twitter Communities.* Graduated 2017.
3. M. Balakrishnamurthy *Comparability Subgraphs in Large Networks.* Graduated 2017.
4. J. Quinn *Applications of Graph Embedding in Mesh Untangling.* Graduated 2017.
5. S. Ahmed *Random Path Assembly for Network Analysis.* Graduated 2014.
6. V. Thotakuri *Analyzing Shakespeare's Plays in a Network Perspective.* Graduated 2014.
7. S. Sriram *Detecting Stable Communities in Large Scale Networks.* Graduated 2013.
8. M. Lee *Sonic Fingerprinting of DNA.* Graduated 2013.
9. P. Meyer *Network Analysis for Identifying Core Structure in Software.* Graduated 2013.
10. K. Duraisamy *Parallel Adaptive Algorithms for Sampling Large Scale Networks.* Graduated 2012. **CS Best Graduate Student Award: Research Category**.
11. P. Paymal *Application Oriented Analysis of Large Datasets.* Graduated 2012.

Undergraduate Students

1. D. Pandey *Network Alignment for Event Graphs* 2024.
2. F. Belay *Tree-Decomposition Algorithms for Networks* 2019.
3. G. De la Maza *Algorithms for Extracting Perfect Graphs* 2019.
4. B. Cramer *Graph Compression Algorithms* 2019-2020.
5. I. Thomas *Link Prediction Methods* 2020.
6. N. Tangirala *Modeling Epidemics in Large Networks* 2016.Partially Funded by UNO.
7. N. Cornelius *Extracting Planar Graphs from Biological Networks* 2016.Partially Funded by UNO.
8. C. Harris *Effect of Developers' Social Structure on Evolution of Software* 2012. Partially Funded by UNO.
9. A. Meddury *Coloring Dynamic Networks* 2011.
10. M. Seil *GPU Algorithms for Extracting Chordal Graphs* 2011.
11. T. Cross *Graph Algorithms in GPUs* 2011.

High School Students (Conducting research under the Texas Academy of Mathematics and Sciences Program)
W. Qian, A. Bandaru, S. Gudapati, E. Singh.

Thesis Committee Member
20 Doctoral Students (UNT, UNO, ISI Kolata, UT Arlington, Missouri Univeristy of Science and Technology).
10 Masters Students (UNO, Penn State).

Professional Services

Organizing Scientific Meetings

Birds of a Feather SC 2022, 2023	Career Panel
Birds of a Feather SC 2022	Panel on Dynamic Graphs (with S. Srinivasan, B. Norris, and S.Das)
Online Lecture Series 2022	MLN-DIVE: Lecture on Multilayer Networks (with S. Chakravathy and K. Madduri) **https://itlab.uta.edu/MLN-DIVE/lecture-series.html**
Minisymposium at SIAM CSE 2019	Reproducibility in Network Algorithms (with B. Norris)
Workshop at BIBM 2017	*Reproducibility and Robustness in Biological Data Analysis and Integration.* (with K. Dempsey and H. Ali)
Minisymposium at SIAM Annual Meeting 2016	*Analysis of Noisy Networks in Theory and Practice.*
at SIAM CSE 2015	(with B. Miller)
Minisymposium at SIAM PP 2016	*Algorithm Comparison, Selection, and Tuning for Large Scale Network and Graph Problems.* (with B. Norris)
Minisymposium at SIAM PP 2014	*Creating Meaningful Network Models.* (with T.-Y. Chen)
Minisymposium at SIAM CSE 2013	*The Effect of Noise and Uncertainity on the Analysis of Large Networks.* (with T.-Y. Chen)
Workshop at INAOE Mexico 2012	*Simulation of Collective Behaviors of Pedestrians and Groups.* (with P. Dasgupta, A. Munoz-Melendez E. Munoz de Cote)
Minisymposium at SIAM Annual Meeting 2012	*Graph Sparsification: Theory and Applications.* (with M. Halappanavar)
Minisymposium at SIAM PP 2012	*Chordal Graphs in Scientific Applications.* (with T.-Y. Chen)
Panel at SC 2010	*Multidisciplinary Perspectives of Teaching Core HPC Concepts.* (with T.-Y. Chen).
Minisymposium at SIAM Annual Meeting, 2009	*High Performance Computing on Massive Real-World Graphs.* (with D. Bader, J. Gilbert, J. Kepner and P. Raghavan).
Minisymposium at SIAM CSE 2009	*The Potential of Computational Algorithms in Data-Mining* (with P. Raghavan).
Minisymposium at SIAM PP 2008	*Multi-method Problems: Challenges and Implementations.*
Minisymposium at SIAM CSE 2007	*Trends in the Evolution of Scientific Computing Software*

Professional Societies

Member of ACM, IEEE
Co-Chair, Education and Outreach Initiative, IEEE Computer Society Technical Consortium on High Performance Computing (TCHPC) 2019-Present

Program Committees (selected).

- International Conference for High Performance Computing Networking,Storage and Analysis (Supercomputing)
  - Chair, Research Posters, 2021
  - Member, Algorithm Track, 2015, 2019,2021,2022,2023

  - Member, Birds of a Feather, 2020-2019
  - Chair, Doctoral Showcase, Chair:2018, Member 2011.
  - Member, Workshop 2009
  - Organizer of Workshop on IA3 (Irregular Algorithms, Applications, and Architecture) 2023-current
- The ISC High Performance 2025; Organizer of Panel on Algorithms, Methods and Performance.
- International Parallel and Distributed Processing Symposium (IPDPS) Algorithms Track 2014,2015,2018.
  Applications Track Chair 2024
  Applications Track 2021
  Multidisciplinary Track 2022
  Ph.D. forum 2021-2023
- International Conference on Parallel Processing (ICPP).
  Algorithms Track Chair 2024
  Algorithms Track Member 2023.
  Student Program Chair 2023.
  Organizer of Workshop on Dynamic Graph Algorithms 2023-2024
- IEEE International Conference on Mobile Ad Hoc and Smart Systems 2022.
- International Conference on Contemporary Computing (IC3), Co-Chair Applications Track 2018, 2019.
- International Conference on High Performance Computing, Data and Analytics (HiPC), Applications Track 2018, 2019.
- International Conference on Computational Science (ICCS) 2012-2018, 2020
- International Conference on COmmunication Systems and NETworkS (COMSNETS) 2016-2019.
- International Conference on Contemporary Computing (IC3) Algorithms Track, 2017.
- IPDPS Workshop on Parallel and Distributed Scientific and Engineering Computing (PDSEC) 2017,2020.
- International Conference on Information Technology (ICIT) 2016.
- International Symposium on Cluster, Cloud and Grid Computing(CCGrid) 2014, 2015.
- International World Wide Web Conference (WWW) Poster Committee, 2015.
- Workshop on Combinatorial Scientific Computing 2014.
- High Performance Computing Symposium ACM/SIGSIM 2013, 2012, 2015.
- Workshop on Complex Networks 2012-2015.
- International Workshop on High Performance Computational Biology, 2012, 2011.
- International Workshop on High Performance Computing Systems for Bioinformatics and Life Sciences, HPCS 2012.
- International Symposium on Parallel and Distributed Processing with Applications, 2011.
- International Conference on Parallel and Distributed Systems (ICPADS), 2010.
- International Workshop on Automatic Performance, 2009.
- Third International Workshop on Automatic Performance Tuning, 2008.

Journals

- Associate Editor for Journal of Parallel and Distributed Computing (2020-Present).
- Reviewer for Theoretical Computer Science, Journal of Complex Systems, PNAS, ACM Computing Surveys,Journal of Computational Science,Journal of Parallel and Distributed Computing,Finite Elements in Analysis and Design,SIAM Journal of Scientific Computing, Transactions on Parallel and Distributed Systems,Transactions on Multi-Scale Computing Systems, PLOS ONE, Journal of Experimental Algorithms, Transaction on Mobile Computing, International Journal of High Performance Computing Applications.

Panelist and Other Activities

1. Co-chair, Education and Outreach Initiative, IEEE Computer Society Technical Consortium on High Performance Computing (TCHPC) 2019-present.
2. TCHPC Career Panel at Supercomputing 2018.
3. Topic: *Is there a market for reconfigurable systems architecture in context of large scale data analysis ?* Workshop on Irregular Applications: Architectures and Algorithms 2018.
4. Topic: *What can statistical physics and machine learning learn from each other ?* Workshop on Dynamics on and of Complex Networks X, 2017.
5. Review of undergraduate research grants (FUSE) for UNO-SPR, 2012-2015.
6. NSF Review Panel 2012, 2014, 2018, 2023, 2024.
7. Professional Development Evening, SIAM Annual Meeting, 2010.

Department and University Committees

- Faculty Advisor for Computer Science Club, UNT 2020-current
- Selection Committee for Dean of College of Engineering, UNT 2022-2023
- Personnel Affairs Committee, CSE, UNT, 2021-2022, 2022-2023.
- Faculty Recruiting Committee, CSE, UNT, 2020-2021. 2022-2023
- Student Integrity Committee, CSE, UNT 2022-2023
- Awards Commitee Chair, CSE, UNT 2021-2022
- Department Chair Recruiting Committee, CSE, UNT, 2020-2021.
- Strategic Planning Committee, CSE, UNT, 2019.
- Grades Appeal Committee, Department of Computer Science and Engineering (CSE), UNT, 2019.
- Faculty Recruiting Committee, CS, UNO, 2017-2018,2014-2015,2013-2014, 2011-2012.
- Diversity Task Force, College of IST, UNO 2012.
- Hiring Committee for System Administrator, Holland Computing Center, 2012, 2009.
- Bioinformatics Undergraduate Program Committee, UNO, 2012-2014
- UNO Student Research and Creative Activity Fair Committee, 2011-2012.
- Graduate Program Committee,CS, UNO, 2011-2015.
- Undergraduate Program Committee, CS , UNO, Fall 2010-Spring 2011.
- Merit Review Committee, Department of Computer Science (CS), UNO, Spring 2010 and Spring 2012.
- Undergraduate Advisor for Engineering Advising Centre of College of Engineering at Penn State, Fall 2008.