

ASSEFAW H. GEBREMEDHIN

Berry Family Distinguished Associate Professor
School of Electrical Engineering and Computer Science
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RESEARCH INTERESTS

- Scalable data science
- Machine learning and artificial intelligence
- Cybersecurity
- Biomedical and health informatics
- Power grid and energy ecosystems

EDUCATION

PhD	Computer Science	University of Bergen, Norway	2003
MS	Computer Science	University of Bergen, Norway	1999
BS	Computer Science	University of Bergen, Norway	1996
BS	Electrical Engineering	Addis Ababa University, Ethiopia	1992

APPOINTMENT HISTORY

08/20–present	<i>Associate Professor</i> , School of EECS, Washington State University
2014–2020	<i>Assistant Professor</i> , School of EECS, Washington State University
2010–2014	<i>Research Assistant Professor</i> , Dept. of Computer Science, Purdue University
2008–2010	<i>Research Assistant Professor</i> , Computing Research Institute, Purdue University
2006–2008	<i>Research Scientist</i> , Dept. of Computer Science, Old Dominion University
2004–2006	<i>Postdoctoral Fellow</i> , Dept. of Computer Science, Old Dominion University
1999–2003	<i>Doctoral Fellow</i> , Dept. of Informatics, University of Bergen, Norway

MAJOR EDUCATION PROGRAM LEADERSHIP

- *Director and Lead PI*, VICEROY Institute for Cybersecurity Education and Research (CySER)
Website: <https://cyser.wsu.edu>
- *Director*, CyberCorps Scholarship for Service (SFS) Program at WSU
Website: <https://cyser.wsu.edu/sfs>
- *Program Director*, Graduate Training Program in AI and Data Science for Complex Engineering Applications, Graduate Assistance in Areas of National Need (GAANN)
Website: <https://labs.wsu.edu/scads/gaann-program/>
- *Lead*, WSU's designation as National Center of Academic Excellence in Cyber Research (CAE-R) by the U.S. National Security Agency (NSA)
Website: <https://maps.caecommunity.org/>

SELECT AWARDS AND HONORS

- 2025: Berry Family Distinguished Associate Professorship
- 2025: Nominee for Sahlin Faculty Excellence Award for Outreach and Engagement
- 2024: EECS Outstanding Program Leadership Award for contributions to cybersecurity
- 2022: VCEA Reid Miller Teaching Excellence Award
- 2022: EECS Teaching Excellence Award
- 2021: George Pólya Prize in Applied Combinatorics
(for joint work with Fredrik Manne and Alex Pothén)
- 2016: National Science Foundation CAREER Award
Project title: *Fast and Scalable Combinatorial Algorithms for Data Analytics*
- 2006–2012: Founding member and co-investigator in the Combinatorial Scientific Computing and Petascale Simulations Institute (CSCAPES), Department of Energy, SciDAC-2 program
University of Bergen

PUBLICATIONS

Note: WSU graduate-student coauthors whom I advise or co-advise are underlined, and undergraduate-student coauthors are marked with asterisk*.

Journal Papers

- J42. J. Crabb, S. Kane, A. Gebremedhin, *Holistic Fairness Considerations in Facility Placement Decisions*, npj Urban Sustainability. In-Press. 2026.
- J41. H. Greenlee, A. Gebremedhin, E. Lofgren, *REPLAY: A GPU-accelerated Tool for Temporal Contact Network Epidemiology*, BMC Medical Informatics and Decision Making, 2025 Dec 22; 25:448. <https://link.springer.com/article/10.1186/s12911-025-03310-2>
- J40. D. Glover, G. Krishnamoorthy, H. Ren, A. Dubey, A. Gebremedhin, *Deep Reinforcement Learning for Distribution Systems Operations: A Tutorial and Survey*, Proceedings of the IEEE, Vol 113, Issue 6, June 2025. <https://ieeexplore.ieee.org/document/11145317>
- J39. M. Lange, R. Hull, F. Batarseh, M. Govindarasu, M. Hasan, D. Jacobson, L. Khot, K. Levitt, J. Reecy, M. Sadoghi, M. Bishop, G. Goins, A. Gebremedhin, A. Kalyanaraman, S. Mallapragada, A. Sarrafzadeh, K. Xia, *Envisioning Cybersecurity and Resiliency in Agricultural and Food Systems*, Nature Food, 20 pages (Perspectives paper). Accepted.
- J38. C. Soss, A. Rajam, J. Layne, E. Serra, M. Halappanavar, and A. Gebremedhin, *ScaWL: Scaling k-WL (Weisfeler-Leman) Algorithms in Memory and Performance on Shared and Distributed-Memory Systems*, ACM Transactions on Architecture and Code Optimization, Vol 22, Issue 1, Article No 45, pp 1–25. 2025 <https://dl.acm.org/doi/10.1145/3715124>
- J37. O. Oje, T. Stirewalt, O. Amram, P. Hystad, S. Amiri and A. Gebremedhin, *HierGP: Hierarchical Grid Partitioning for Scalable Geospatial Data Analytics*, ACM Transactions on Spatial Algorithms and Systems, Vol 11, Issue 12, Article No 7, pp 1–20. 2025. <https://dl.acm.org/doi/10.1145/3699511>
- J36. O. Oje, O. Amram, P. Hystad, A. Gebremedhin, and P. Monsivais, *Use of Individual Google Location History Data to Identify Consumer Encounters with Food Outlets*, International Journal of Health Geographics (2025) 24:1. <https://doi.org/10.1186/s12942-025-00387-w>

- J35. O. Amram, O. Oje, A. Larkin, K. Baokye, A. Avery, A. Gebremedhin, B. Williams, G. Duncan, and P. Hystad, *Smartphone Google Location History: A Novel Approach to Outdoor Physical Activity Research*, Journal of Physical Activity and Health, pp. 1–9, 2024. <https://doi.org/10.1123/jpah.2024-0360>
- J34. S. Patil, S. Roberts and A. Gebremedhin, *Network Analysis of Driver Genes in Human Cancers*, Frontiers in Bioinformatics, Vol 4, 2024. <https://doi.org/10.3389/fbinf.2024.1365200>
- J33. J. Halvorsen, C. Izurieta, H. Cai and A. Gebremedhin, *Applying Generative Machine Learning to Intrusion Detection: A Systematic Mapping Study and Review*, ACM Computing Surveys, Volume 56, Issue 10, Article No. 257, pages 1-33, 2024. <https://doi.org/10.1145/3659575>
- J32. J. Halvorsen and A. Gebremedhin, *Generative Machine Learning for Cyber Security*, Military Cyber Affairs, Vol 7, Iss. 1, Article 4, 2024.
- J31. J. Briscoe, C. DeSmet, K. Wuestney, A. Gebremedhin, R. Fritz, and D.J. Cook *Exploring Geriatric Clinical Data and Mitigating Bias with Multi-Objective Synthetic Data Generation for Equitable Health Predictions*, Journal of Biomedical Engineering and Biosciences, 2024.
- J30. P. Hystad, O. Amram, O. Oje, A. Larkin, K. Boakye, A. Avery, A. Gebremedhin and G. Duncan, *Bring Your Own Location Data: Use of Google Smartphone Location History Data for Environmental Health Research*, Environmental Health Perspectives 130:11 CID: 117005. 2022. <https://doi.org/10.1289/EHP10829>
- J29. X. Liu, M. Halappanavar, K. Barker, A. Lumsdaine and A.H. Gebremedhin, *Direction-Optimizing Label Propagation Framework for Structure Detection in Graphs: Design, Implementation, and Experimental Analysis*, ACM Journal of Experimental Algorithmics, Vol 27, Article No 1.12, pp 1-31, 2022. <https://doi.org/10.1145/3564593>
- J28. S. Patil, H. Catanese, K. Brayton, E. Lofgren and A.H. Gebremedhin. *Sequence Similarity Network Analysis Provides Insight into the Temporal and Geographical Distribution of Mutations in SARS-CoV-2 Spike Protein*, Viruses 2022, 14, 1672. <https://doi.org/10.3390/v14081672>
- J27. L. Wang, J. Halvorsen, S. Pannala, A. Srivastava, A.H. Gebremedhin and N. Schulz, *CP-SyNet: A Tool for Generating Customized Cyber-Power Synthetic Network for Distribution System with Distributed Energy Resources*, IET Smart Grid, 5(6), 463-477 (2022).
- J26. L. Wang, A. Dubey, A.H. Gebremedhin, A. Srivastava and N. Schulz, *MPC-Based Decentralized Voltage Control in Power Distribution Systems with EV and PV Coordination*, IEEE Transactions on Smart Grid, vol. 13, no. 4, pp. 2908-2919, July 2022. doi: 10.1109/TSG.2022.3156115.
- J25. J. Stachofsky, A.H. Gebremedhin and R. Crossler, *Cast to Vote: A Socio-technical Network Analysis of an Election Smartphone Application*, Digital Government: Research and Practice, Volume 3, Issue 1, January 2022, Article No 3, pp 1–17. <https://doi.org/10.1145/3501031>
- J24. Y. Du, G. Warnell, A.H. Gebremedhin, P. Stone and M. Taylor, *Lucid Dreaming for Experience Replay: Refreshing Past States with Current Policy*, Neural Computing and Applications (2021). <https://doi.org/10.1007/s00521-021-06104-5>
- J23. R. Saeedi, K.S. Sajan, K. Davies, A. Srivastava and A.H. Gebremedhin, *An Adaptive Machine Learning Framework for Behind-the-Meter Load/PV Disaggregation*, IEEE Transactions on Industrial Informatics, Vol 17, No 10, pp 7060-7069, 2021.

- J22. R. Saeedi, K. Sasani and A.H. Gebremedhin, *Collaborative Multi-Expert Active Learning for Mobile Health Monitoring: Architectures, Algorithms and Evaluation*, Sensors, 20(7), 1932, 2020.
- J21. S. Norgaard*, R. Saeedi and A.H. Gebremedhin, *Multi-Sensor Time Series Classification for Activity Tracking Under Variable Length*, IEEE Sensors Journal, Vol 20, No 5, 2701–2709, 2020.
- J20. R. Saeedi and A.H. Gebremedhin, *A Signal-level Transfer Learning Framework for Autonomous Reconfiguration of Wearable Systems*, IEEE Transactions on Mobile Computing, Vol 19, Number 3, 513–527, 2020. DOI: 10.1109/TMC.2018.2878673.
- J19. A.H. Gebremedhin and A. Walther, *An Introduction to Algorithmic Differentiation*, WIREs Data Mining and Knowledge Discovery, 2020; 10:e1334. <https://doi.org/10.1002/widm.1334>
- J18. Y. Du, M. Taylor and A.H. Gebremedhin, *Analysis of University Fitness Center Data Uncovers Interesting Patterns, Enables Prediction*, IEEE Transactions on Knowledge and Data Engineering, Vol 31, Issue 8, 1478–1490, 2019.
- J17. H. Catanese, K. Brayton and A.H. Gebremedhin, *A Nearest-neighbors Network Model for Sequence Data Reveals New Insight into Genotype Distribution of a Pathogen*, BMC Bioinformatics (2018) 19:475. <https://doi.org/10.1186/s12859-018-2453-2>.
- J16. H. Lu, M. Halappanavar, D. Chavarrí a Miranda, A.H. Gebremedhin, A. Panyala and A. Kalyanaraman, *Algorithms for Balanced Graph Colorings with Applications in Parallel Computing*, IEEE Transactions on Parallel and Distributed Systems, 28(5), 1240–1256, 2017.
- J15. H.N. Catanese, K.A. Brayton and A.H. Gebremedhin, *RepeatAnalyzer: A Tool for Analyzing and Managing Short-Sequence Repeat Data*, BMC Genomics 2016 17:422. DOI: 10.1186/s12864-016-2686-2.
- J14. Z.T.H. Khumalo, H.N. Catanese, N. Leisching, P. Hove, N.E. Collins, M.E. Chaisit, A.H. Gebremedhin, M.C. Oosthuizen and K.A. Brayton, *Characterization of Anaplasma marginale subspecies centrale using msp1aS genotyping reveals wildfire reservoir*, Journal of Clinical Microbiology, 2016, 54:10, 2503-2512.
- J13. M. Wang, A.H. Gebremedhin and A. Pothen, *Capitalizing on Live Variables: New Algorithms for Efficient Hessian Computation via Automatic Differentiation*, Mathematical Programming Computation, 8(4), 393–433, 2016. DOI: 10.1007/s12532-016-0100-3.
- J12. R.A. Rossi, D.F. Gleich and A.H. Gebremedhin, *Parallel Maximum Clique Algorithms with Applications to Network Analysis*, SIAM Journal on Scientific Computing, Vol 37, Issue 5, pages C589–C618, 2015.
- J11. B. Pattabiraman, M.M.A. Patwary, A.H. Gebremedhin, W.K. Liao and A. Choudhary, *Fast Algorithms for the Maximum Clique Problem on Massive Graphs with Applications to Overlapping Community Detection*, Internet Mathematics, Vol 11, No 4-5, pp 421–448, 2015.
- J10. A.H. Gebremedhin, D. Nguyen, M.M.A. Patwary and A. Pothen, *ColPack: Software for Graph Coloring and Related Problems in Scientific Computing*, ACM Transactions on Mathematical Software, Vol 40, No 1, pp 1–31, 2013.
- J9. U. Catalyurek, J. Feo, A.H. Gebremedhin, M. Halappanavar and A. Pothen, *Graph Coloring Algorithms for Multi-core and Massively Multithreaded Architectures*, Parallel Computing, Vol 38, pp 576-594, 2012.

- J8. D. Bozdağ, U. Catalyurek, A.H. Gebremedhin, F. Manne, E.G. Boman and F. Özgüner, *Distributed-memory Parallel Algorithms for Distance-2 Coloring and Related Problems in Derivative Computation*, SIAM Journal on Scientific Computing, Vol 32, Issue 4, pp 2418–2446, 2010.
- J7. A.H. Gebremedhin, A. Pothén, A. Tarafdar and A. Walther, *Efficient Computation of Sparse Hessians using Coloring and Automatic Differentiation*, INFORMS Journal on Computing, Vol 21, No 2, pp 209–223, 2009.
- J6. D. Bozdağ, A.H. Gebremedhin, F. Manne, E.G. Boman and U. Catalyurek, *A Framework for Scalable Greedy Coloring on Distributed Memory Parallel Computers*, Journal of Parallel and Distributed Computing, Vol 68, No 4, pp 515–535, 2008.
- J5. A.H. Gebremedhin, A. Tarafdar, F. Manne and A. Pothén, *New Acyclic and Star Coloring Algorithms with Applications to Hessian Computation*, SIAM Journal on Scientific Computing, Vol 29, No 3, pp 1042–1072, 2007.
- J4. A.H. Gebremedhin, M. Essaidi, I. Guérin Lassous, J. Gustedt, and J.A. Telle, *PRO: A Model for the Design and Analysis of Efficient and Scalable Parallel Algorithms*, Nordic Journal of Computing, Vol 13, pp 1–25, 2006.
- J3. A.H. Gebremedhin, F. Manne and A. Pothén, *What Color Is Your Jacobian? Graph Coloring for Computing Derivatives*, SIAM Review Vol 47, No 4, pp 629–705, 2005.
- J2. A.H. Gebremedhin, I. Guérin Lassous, J. Gustedt and J.A. Telle, *Graph Coloring on Coarse Grained Multicomputers*, Discrete Applied Math, Vol 131/1, pp 179–198, 2003.
- J1. A.H. Gebremedhin and F. Manne, *Scalable Parallel Graph Coloring Algorithms*, Concurrency: Practice and Experience, Vol 12, pp 1131–1146, 2000.

Conference Papers

- C53. A. Jillepalli, J. Crabb, D. Rice, A. Gebremedhin, *Examining the Impact of Instructor-Client Mentoring Models in CS Capstone Courses at a Public University*, ACM Technical Symposium on Computer Science Education (SIGCSE TS 2026). <https://dl.acm.org/doi/10.1145/3770762.3772577>
- C52. A. Jillepalli, D. Rice, J. Crabb, A. Gebremedhin, *Effects of Project Type on CS Capstone Courses*, ACM Technical Symposium on Computer Science Education (SIGCSE TS 2026). <https://dl.acm.org/doi/10.1145/3770762.3772578>
- C51. T. Stirewalt and A. Gebremedhin, *Poster: Adversarial Habituation Attack: A Psychological Extension and Re-framing of Boiling Frog Attack*, 2025 ACM SIGSAC Conference on Computer and Communications Security (CCS’25). <https://dl.acm.org/doi/10.1145/3719027.3760741>
- C50. D. Biehler, T. Stirewalt, Z. Abou-Harb, A. Gebremedhin, *STAAR-FM: Scalable Terrain-Aware Adaptive Resolution Framework for Flow Modeling*, ACM SIGSPATIAL International Workshop on Geospatial Simulation (GeoSIM’25), Nov 2025. <https://dl.acm.org/doi/abs/10.1145/3764921.3770149>
- C49. J. Briscoe, G. Kepler, D. Deford, and A. Gebremedhin, *Algorithmic Accountability in Small Data: Reliability and Fairness in Classification Metrics*, International Conference on Artificial Intelligence and Statistics (AISTATS), 2025

- C48. J. Halvorsen, Y. Yan, and A. Gebremedhin, *Denoising Diffusion Implicit Models for Generating Cyber Defense Network Traffic*, IEEE International Conference on Communications (ICC), 2025.
- C47. J. Briscoe and A. Gebremedhin, *Facets of Disparate Impact: Evaluating Legally Consistent Bias in Machine Learning*, ACM International Conference on Information and Knowledge Management (CIKM), 2024. <https://doi.org/10.1145/3627673.3679925>
- C46. J. Crabb, C. Hundhausen and A. Gebremedhin, *A Critical Review of Cybersecurity Education in the United States*, ACM Technical Symposium on Computer Science Education (SIGCSE), 2024. <https://doi.org/10.1145/3626252.3630757>
- C45. J. Briscoe, C. DeSmet, K. Wuestney, A. Gebremedhin, R. Fritz, and D.J. Cook *Reducing Sample Selection Bias in Clinical Data through Generation of Multi-Objective Synthetic Data*, The 11th International Conference on Biomedical Engineering and Systems (ICBES), 2024.
- C44. X. Liu, J. Firoz, S. Aksoy, I. Amburg, A. Lumsdaine, C. Joslyn, B. Praggastis and A.H. Gebremedhin, *High-order Line Graphs of Non-uniform Hypergraphs: Algorithms, Applications, and Experimental Analysis*, 2022 IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2022, pp. 784-794, doi: 10.1109/IPDPS53621.2022.00081.
- C43. X. Liu, J. Firoz, A.H. Gebremedhin and A. Lumsdaine, *NWHy: A Framework for Hypergraph Analytics: Representations, Data structures, and Algorithms*, 2022 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW), 2022, pp. 275-284, doi: 10.1109/IPDPSW55747.2022.00057.
- C42. X. Liu, J. Firoz, A. Lumsdaine, C. Joslyn, S. Aksoy, B. Praggastis and A.H. Gebremedhin, *Parallel Algorithms for Efficient Computation of High-Order Line Graphs of Hypergraphs*, 2021 IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC), 2021, pp. 312-321. doi: 10.1109/HiPC53243.2021.00045. [**Nominated for Best Paper Award**]
- C41. G. Krishnamoorthy, A. Dubey and A. H. Gebremedhin, *An Open-source Environment for Reinforcement Learning in Power Distribution Systems*, 2022 IEEE Power & Energy Society General Meeting (PESGM), 2022, pp. 1-5. doi: 10.1109/PESGM48719.2022.9916862.
- C40. G. Krishnamoorthy, A. Dubey and A.H. Gebremedhin, *Reinforcement Learning for Battery Energy Storage Dispatch Augmented with Model-based Optimizer*, 2021 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), 2021, pp. 289-294. doi: 10.1109/SmartGridComm51999.2021.9632292.
- C39. J. Briscoe, A. Gebremedhin, L. Holder and D. Cook, *Adversarial Creation of a Smart Home Testbed for Novelty Detection*, AAAI Spring Symposium Series, March 2022.
- C38. S. Ghosh, Y. Guo, P. Balaji and A.H. Gebremedhin, *RMACXX: An Efficient High-Level C++ Interface over MPI-3 RMA*, IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGrid 2021), May 10-13, 2021, Melbourne, Australia.
- C37. X. Liu, M. Halappanavar, K. Barker, A. Lumsdaine and A.H. Gebremedhin, *Direction-optimizing Label Propagation and its Application to Community Detection*, Computing Frontiers, 2020.
- C36. Y. Du, G. Warnell, A.H. Gebremedhin, P. Stone and M. Taylor, *Work-in-Progress: Corrected Self Learning via Demonstrations*, Proceedings of the Adaptive and Learning Agents Workshop at AAMAS. May 2020.

- C35. S. Ghosh, M. Halappanavar, A. Kalyanaraman, A. Khan and A.H. Gebremedhin, *Exploring MPI Communication Models for Graph Applications Using Graph Matching as a Case Study*, IEEE International Parallel and Distributed Processing Symposium (IPDPS 2019), May 2019, Rio de Janeiro, Brazil, 10 pages.
- C34. X. Liu, J. Firos, M. Zalewski, M. Halappanavar, K. Baker, A. Lumsdaine and A.H. Gebremedhin, *Distributed Direction-optimizing Label Propagation for Community Detection*, 2019 IEEE High Performance Extreme Computing Conference (HPEC), Waltham, MA, USA, 2019, pp1–6. [**2019 Graph Challenge Innovation Award**].
- C33. E. Khaledian, A.H. Gebremedhin, K. Brayton and S. Broschat, *A Network Science Approach for Determining the Ancestral Phylum of Bacteria*, In Proceedings of the 2018 ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics (BCB '18). ACM, New York, NY, USA, 398-403. DOI: <https://doi.org/10.1145/3233547.3233575>
- C32. S. Ghosh, M. Halappanavar, A. Tumeo, A. Kalyanaraman, H. Lu, D. Chavarria-Miranda, A. Khan and A. H. Gebremedhin, *Distributed Louvain Algorithm for Graph Community Detection*, 2018 IEEE International Parallel and Distributed Processing Symposium (IPDPS), Vancouver, BC, 2018, pp. 885-895. doi: 10.1109/IPDPS.2018.00098
- C31. S. Ghosh, M. Halappanavar, A. Tumeo, A. Kalyanaraman and A.H. Gebremedhin, *miniVite: A Graph Analytics Benchmarking Tool for Massively Parallel Systems*, 2018 IEEE/ACM Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems (PMBS), Dallas, TX, USA, 2018, pp. 51-56. doi: 10.1109/PMBS.2018.8641631 (Supercomputing'18 Workshop)
- C30. K. Sasani, M. Namaki and A.H. Gebremedhin, *Network Similarity Prediction in Time-evolving Graphs: A Machine Learning Approach*, 2018 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW), Vancouver, BC, 2018, pp. 1184-1193. doi: 10.1109/IPDPSW.2018.00183.
- C29. S. Norgaard*, R. Saeedi, K. Sasani and A.H. Gebremedhin, *Synthetic Sensor Data Generation for Health Applications: A Supervised Deep Learning Approach*, 2018 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Honolulu, HI, 2018, pp. 1164-1167. doi: 10.1109/EMBC.2018.8512470
- C28. R. Saeedi, K. Sasani, S. Norgaard* and A.H. Gebremedhin, *Personalized Human Activity Recognition using Wearables: A Manifold Learning-based Knowledge Transfer*, 2018 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Honolulu, HI, 2018, pp. 1193-1196. doi: 10.1109/EMBC.2018.8512533
- C27. K. Sasani, M. Namaki, Y. Wu and A.H. Gebremedhin, *Multi-metric Graph Query Performance Prediction*, In: Pei J., Manolopoulos Y., Sadiq S., Li J. (eds) Database Systems for Advanced Applications. DASFAA 2018. Lecture Notes in Computer Science, vol 10827. Springer, Cham. https://doi.org/10.1007/978-3-319-91452-7_19
- C26. M. H. Namaki, K. Sasani, Y. Wu and A.H. Gebremedhin, *Performance Prediction for Graph Queries*, In Proceedings of the 2nd International Workshop on Network Data Analytics (NDA'17), Akhil Arora, Shourya Roy, and Arnab Bhattacharya (Eds.). ACM, New York, NY, USA, Article 4, 9 pages. DOI: <https://doi.org/10.1145/3068943.3068947> (Workshop at the ACM SIGMOD International Conference on Management of Data).

- C25. S. Ghosh, M. Halappanavar, A. Tumeo, A. Kalyanaraman and A.H. Gebremedhin, *Scalable Distributed-memory Community Detection using Vite*, IEEE High Performance Extreme Computing Conference (HPEC 2018), September 2018, Waltham, MA, 8 pages. DOI: 10.1109/HPEC.2018.8547534 [**2018 Graph Challenge Student Innovation Award**].
- C24. R. Saeedi, S. Norgaard*, A.H. Gebremedhin, *A Closed-loop Deep Learning Architecture for Robust Activity Recognition using Wearable Sensors*, 2017 IEEE International Conference on Big Data (Big Data), Boston, MA, 2017, pp. 473-479. doi: 10.1109/BigData.2017.8257960
- C23. R. Saeedi, K. Sasani and A.H. Gebremedhin, *Co-MEAL: Cost-Optimal Multi-Expert Active Learning Architecture for Mobile Health Monitoring*, In Proceedings of the 8th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM-BCB '17). ACM, New York, NY, USA, 432-441. DOI: <https://doi.org/10.1145/3107411.3107430>
- C22. R. Saeedi, H. Ghasemzadeh and A.H. Gebremedhin, *Transfer Learning Algorithms for Autonomous Configuration of Wearable Systems*, 2016 IEEE International Conference on Big Data (Big Data), Washington, DC, 2016, pp. 563-569. doi: 10.1109/BigData.2016.7840648
- C21. S. Ghosh and A.H. Gebremedhin, *Parallelization of Bin Packing on Multicore Systems*, 2016 IEEE 23rd International Conference on High Performance Computing (HiPC), Hyderabad, 2016, pp. 311-320. doi: 10.1109/HiPC.2016.044
- C20. S. Ghosh, J.R. Hammond, A.J. Pena, P. Balaji, A.H. Gebremedhin and B. Chapman, *One-sided Interface for Matrix Operations using MPI-3 RMA: A Case Study with Elemental*, 45th International Conference on Parallel Processing (ICPP), Philadelphia, PA, 2016, pp. 185-194. doi: 10.1109/ICPP.2016.28
- C19. X. Lu, M. Halappanavar, D. Chavarrí a Miranda, A.H. Gebremedhin and A. Kalyanaraman, *Balanced Coloring for Parallel Computing Applications*, 2015 IEEE International Parallel and Distributed Processing Symposium, Hyderabad, 2015, pp. 7-16. doi: 10.1109/IPDPS.2015.113
- C18. R.A. Rossi, D.F. Gleich, A.H. Gebremedhin and M.M.A. Patwary, *Fast Maximum Clique Algorithms for Large Graphs*, In Proceedings of the 23rd International Conference on World Wide Web (WWW '14 Companion). ACM, New York, NY, USA, 365-366. DOI: <https://doi.org/10.1145/2567948.2577283>
- C17. B. Pattabiraman, M.M.A. Patwary, A.H. Gebremedhin, W.K. Liao and A. Choudhary, *Fast Algorithms for the Maximum Clique Problem on Massive Sparse Graphs*, In: Bonato A., Mitzenmacher M., Prałat P. (eds) Algorithms and Models for the Web Graph. WAW 2013. Lecture Notes in Computer Science, vol 8305. Springer, Cham. https://doi.org/10.1007/978-3-319-03536-9_13.
- C16. B. Letschert, K. Kulshreshtha, A. Walther, D. Nguyen, A.H. Gebremedhin and A. Pothén, *Exploiting Sparsity in Automatic Differentiation on Multicore Architectures*, In S. Forth et al. (Eds.), Recent Advances in Algorithmic Differentiation (AD2012), Lecture Notes in Computational Science and Engineering, vol 87. Springer, Berlin, Heidelberg. DOI: 10.1007/978-3-642-30023-3_14.
- C15. S.H.K. Narayanan, B. Norris, P. Hovland and A.H. Gebremedhin, *Implementation of Partial Separability in a Source to Source Transformation AD Tool*, In S. Forth et al. (Eds.), Recent Advances in Algorithmic Differentiation (AD2012), Lecture Notes in Computational Science and Engineering, vol 87. Springer, Berlin, Heidelberg. DOI: 10.1007/978-3-642-30023-3_31.

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- C11. A.H. Gebremedhin, A. Pothen and A. Walther, *Exploiting Sparsity in Jacobian Computation via Coloring and Automatic Differentiation: a Case Study in a Simulated Moving Bed process*, In C. Bischof et al. (Eds.), Advances in Automatic Differentiation (AD2008), Lecture Notes in Computational Science and Engineering 64, pp 339–349, 2008.
- C10. E.G. Boman, D. Bozdağ, U. Catalyurek, K. Devine, A.H. Gebremedhin, P. Hovland and A. Pothen, *Combinatorial Algorithms for Computational Science and Engineering*, Journal of Physics: Conference Series 125 (2008) 012071. SciDAC 2008.
- C9. E.G. Boman, D. Bozdağ, U. Catalyurek, K. Devine, A.H. Gebremedhin, P. Hovland, A. Pothen and M.M. Strout, *Enabling High Performance Computational Science through Combinatorial Algorithms*, Journal of Physics: Conference Series 78 (2007) 012058. SciDAC 2007.
- C8. S. Bhomwick, E.G. Boman, K. Devine, A.H. Gebremedhin, B. Hendrickson, P. Hovland, T. Munson and A. Pothen, *Combinatorial Algorithms Enabling Computational Science: Tales from the Front*, Journal of Physics: Conference Series 46 (2006), 453–457, SciDAC 2006.
- C7. D. Bozdağ, U. Catalyurek, A.H. Gebremedhin, F. Manne, E.G. Boman and F. Özgüner, *A Parallel Distance-2 Graph Coloring Algorithm for Distributed Memory Computers*, In L.T. Yang et al. (Eds.): HPCC 2005, Lecture Notes in Computer Science 3726, pp 796–806, 2005.
- C6. E.G. Boman, D. Bozdağ, U. Catalyurek, A.H. Gebremedhin and F. Manne, *A Scalable Parallel Graph Coloring Algorithm for Distributed Memory Computers*, In J. Cumba and P. Medeiros (Eds.): EuroPar 2005, Lecture Notes in Computer Science 3648, pp 241–251, 2005.
- C5. A.H. Gebremedhin, F. Manne and T. Woods, *Speeding up Parallel Graph Coloring*, In J. Dongarra, K. Madsen, and J. Wasniewski (Eds.): Para 2004, Lecture Notes in Computer Science 3732, pp 1079–1088, 2005.
- C4. A.H. Gebremedhin, F. Manne and A. Pothen, *Parallel Distance-k Coloring Algorithms for Numerical Optimization*, In B. Monien and R. Feldmann (Eds.): EuroPar 2002, Lecture Notes in Computer Science 2400, pp 912–921, 2002.
- C3. A.H. Gebremedhin, I. Guérin Lassous, J. Gustedt and J.A. Telle, *PRO: a Model for Parallel Resource-Optimal Computation*, IEEE International Symposium on High Performance Computing Systems and Applications, pp 106–113, 2002.
- C2. A.H. Gebremedhin, I. Guérin Lassous, J. Gustedt and J.A. Telle, *Graph Coloring on a Coarse Grained Multiprocessor*, In U. Brandes and D. Wagner (Eds.): WG 2000, Lecture Notes in Computer Science 1928, pp 184–195, 2000.
- C1. A.H. Gebremedhin and F. Manne, *Parallel Graph Coloring Algorithms using OpenMP*, EWOMP 99, First European Workshop on OpenMP, Sept 1999, Lund, Sweden.

Magazine Articles

- M5. A. Gebremedhin and J. Crabb, *Ten Takeaways from the VICEROY CySER Summer Workshop 2025*, CYBER Magazine, MCPA, Sept 2025.
- M4. T. Stirewalt, C. Bale*, G. Kochele*, N. Simkins*, A. Gebremedhin, *The Effect of AI Tools on Static Analysis of Source Code for Authorship Attribution*, CYBER Magazine, MCPA, June 2025.
- M3. J. Crabb, C. Izurieta, B. Van Wie, O. Adesope and A. Gebremedhin, *Cybersecurity Education: Insights From A Novel Cybersecurity Summer Workshop*, IEEE Security & Privacy, vol 22, pp 89-98, Nov-Dec 2024.
- M2. J. Crabb and A. Gebremedhin, *Cybersecurity Education and Research: Experiences in Training the Next Generation of Cyber Professionals*, CYBER Magazine, MCPA, May 2024.
- M1. H. Catanese, C. Hauser and A. Gebremedhin, *Evaluation of Native and Transfer Students' Success in a Computer Science Course*, ACM Inroads, 9(2), 53–57, 2018.

Edited Volumes

- V2. A.H. Gebremedhin, E. Boman and B. Ucar (Eds.), *Proceedings of the Seventh SIAM Workshop on Combinatorial Scientific Computing*, 2016, SIAM.
- V1. T. Sørøvik, F. Manne, R. Moe, and A.H. Gebremedhin (Eds.), *New Paradigms for High Performance Computing in Industry and Academia*, Para 2000, Workshop on Applied Parallel Computing, Lecture Notes in Computer Science 1947, 2001, Springer.

RECENT PRESS (LAST FIVE YEARS)

- 1. Workshop brings cybersecurity leaders and students to Pullman May 18-22, WSU INSIDER, May 14, 2026
- 2. WSU student team takes first at national cyber competition, WSU INSIDER, April 30, 2026
- 3. WSU scientists build on expertise in energy grid, computer security, WSU INSIDER, February 12, 2026
- 4. Students earn top ranking in cyber competition, WSU INSIDER, January 29, 2026
- 5. WSU projects draw on AI to advance medical science, WSU INSIDER, January 27, 2026
- 6. Voiland College names Berry professors, WSU INSIDER, October 21, 2025
- 7. WSU designated as center of excellence in cyber research, WSU INSIDER, September 19, 2025
- 8. NSF grant will support international research in cybersecurity for AI, WSU INSIDER, July 19, 2025
- 9. WSU cybersecurity students gain national recognition, WSU INSIDER, July 3, 2025
- 10. Workshop brings cybersecurity education and research to Pullman, WSU INSIDER, May 15, 2025
- 11. Smartphone location data shows promise for public health research, WSU INSIDER, April 24, 2025
- 12. NSF grant to support cybersecurity training, WSU INSIDER, December 23, 2024

13. WSU CyberCougs place first at national competition, WSU INSIDER, December 11, 2024
14. Researchers improve search for cancer drivers, WSU INSIDER, September 11, 2024.
15. How Is AI Being Used in Day-to-Day Life? Washington State Steps Ahead, The Bellingham Herald, May 20, 2024.
16. Summer workshop brings cybersecurity education and research to Pullman campus, WSU INSIDER, May 13, 2024.
17. Cybersecurity education varies widely in US, WSU INSIDER, May 6, 2024.
18. Students get real-world learning in cybersecurity, WSU INSIDER, July 12, 2023.
19. Degree in cybersecurity gets underway, WSU INSIDER, June 15, 2023.
20. CyberCougs place first at regional competition, WSU INSIDER, March 15, 2023.
21. Gebremedhin receives prestigious international applied mathematics prize, WSU INSIDER, February 23, 2021.
22. SIAM AN21 Prize Spotlight, SIAM News, July 1, 2021.
23. Training students at the intersection of power engineering and computer science, WSU INSIDER, November 4, 2021.
24. WSU Team To Train Doctoral Students In AI, Data Science To Meet Energy Needs, Northwest Public Broadcasting, November 10, 2021.
25. WSU to lead cybersecurity education and research institute, WSU INSIDER, July 16, 2021.

SOFTWARE

- **GMCAV**, a web-based tool for geospatial and molecular cancer analytics and visualization. Tool available at <https://gmcav.eecs.wsu.edu>. Code base available at <https://github.com/Deven-Biehler/geocav/>
- **REPLAY**, a GPU-accelerated tool for temporal contact network epidemiology. Code available at <https://github.com/HarrisonGreenlee/Replay>
- **SHUFFLE**: a rule-based generator for temporal hospital contact networks. <https://github.com/HarrisonGreenlee/Shuffle>
- **DOLPA**: Direction-Optimizing Label Propagation Algorithm framework for structure detection in graphs. <https://datascience.aeolus.wsu.edu/tlieu/dolpa>
- **RepeatAnalyzer**, a software tool for tracking, managing, analyzing and cataloguing short-sequence repeats and genotypes using *Anaplasma marginale* as a model species. Code available at <https://labs.wsu.edu/scads/software/>
- **SuperGAN**, a Generative Adversarial Networks-based Python software tool for generating realistic, synthetic, labeled time-series data (in lieu of sensor data). Work-in-progress. Preliminary code available at <https://labs.wsu.edu/scads/software/>
- **LivarH**, a Live-variables based Hessian computation via Automatic Differentiation (implemented in ADOL-C). Code available at <https://github.com/CSCsw/LivarH>
- **PMC**, a fast, parallel maximum clique finder. Further information available at <https://github.com/ryanrossi/pmc>

- **ColPack**, a C++ library consisting of implementations of algorithms for a variety of graph coloring and related problems enabling scientific computations. Further information available at <http://www.eecs.wsu.edu/~assefaw/software/software.html>.
- ColPack is interfaced with the operator overloading AD tool **ADOL-C** (housed at the University of Paderborn, Germany) and the source-to-source transformation AD tool *ADIC2* (housed at Argonne National Laboratory).
- Implementations of several distributed-memory coloring algorithms developed together with colleagues are included in **Zoltan**, a load balancing toolkit of Sandia National Laboratories.

GRADUATED STUDENTS (7 PhD; 5 MS-THESIS)

1. Jarren Briscoe, PhD, co-advised with Diane Cook. Graduated April 2026.
Thesis Title: *Toward Accountable AI Systems: Objective Fairness, Evaluation, and Robustness.* Current Position: TBD
2. James Halvorsen, PhD, Graduated April 2026.
Thesis Title: *Machine Learning for Network Security: Metrics, Algorithms, and Applications.* Current Position: TBD
3. Shruti Patil, PhD, Graduated April 2026.
Thesis Title: *Geospatial and Network Analysis of SARS-CoV-2 Mutations and Cancer for Understanding Disease Patterns.*
Current Position: Data Scientist at Capital One.
4. Zayn Abou-Harb, MS, Graduated April 2026.
Thesis Title: *Interpretable Ensemble Methods for Geophysical Vortex Detection and Time Series Forecasting.*
Current Position: Software Engineer at Epic.
5. Deven Biehler, MS, Graduated Dec 2025.
Thesis title: *Scalable Geospatial Algorithms for Flow Modeling.*
Current Position: TBD.
6. James Crabb, MS, Graduated Dec 2023.
Thesis Title: *Critical Review of Cybersecurity Education in the United States.*
Current Position: Program Coordinator (splits time between the WSU SFS Program and the CySER Institute).
7. Xu (Tony) Liu, PhD, Graduated July 2021.
 Tony was WSU-PNNL Distiguished Graduate Research Program (DGRP) fellow (first cohort), and was co-advised by Andrew Lumsdaine.
Thesis Title: *Structure Detection in Graphs and Hypergraphs.*
Current Position: SDE II at AWS (Amazon).
8. Yunshu Du, PhD, co-advised with Matt Taylor. Graduated April 2021.
Thesis Title: *Transfer in Deep Reinforcement Learning: How an Agent Can Leverage Knowledge from Another Agent, a Human, or Itself.*
Current Position: Data Scientist at Sony AI.
9. Sayan Ghosh, PhD, Graduated April 2019.
Thesis Title: *Supporting Efficient Graph Analytics and Scientific Computation using Asynchronous Distributed-Memory Programming Models.*
Current Position: Computer Scientist at PNNL.

10. Ramyar Saeedi, PhD, Graduated July 2018.
Thesis Title: *Efficient Machine Learning Algorithms for Automatic Reconfiguration of Mobile Health Monitoring Systems.*
Current Position: ML Engineer at Uber.
11. Keyvan Sasani, MS, Graduated Dec 2018.
Thesis Title: *Machine Learning for Predicting Performance of Graph Algorithms with Applications in Graph Databases and Network Similarity*
Current Position: Data Engineer at Meta.
12. Helen Catanese, MS, Graduated May 2017.
Thesis Title: *RepeatAnalyzer: A Tool for Analyzing and Managing Short-Sequence Repeat Data.*
Current Position: Senior Software Engineer at Addium

CURRENT GRADUATE STUDENTS (5 PhD)

1. Olufunso Oje, PhD student, Fall 2021 – present.
Topic: Data science and environmental health.
Status: Passed Prelim Exam in Spring 2025.
2. Coby Soss, PhD student, Fall 2021 – present.
Topic: AI and graph algorithms.
Status: Passed PhD Prelim Exam in Spring 2025. Coby works full-time at SEL while pursuing his PhD study.
3. Stephanie Kane, PhD student (Independent Interdisciplinary Program),
co-advised with Jan Dasgupta, Fall 2022 – present.
Topic: Responsible Data science.
Status: Passed PhD Prelim Exam in Fall 2025. Stephanie works full-time at WSU in the Office of Institutional Research while pursuing her PhD study.
4. Harrison Greenlee, PhD student, Spring 2023 – present.
Topic: AI and computational epidemiology.
Status: Passed PhD Prelim Exam in Spring 2026.
5. Tashi Stirewalt, PhD student, Fall 2023 – present.
Topic: Cybersecurity and graph algorithms.
Status: Passed PhD Qualifying Exam.

RESEARCH FUNDING

Funding since joining WSU:	\$10.1M as PI (\$26.1M total)
Award under negotiation:	\$2.7M as PI (\$2.7M total)

Current Projects:

1. *IRES: US-Sweden Collaborative Research on Advancing Security and Privacy in AI-based Systems.* National Science Foundation, 08/2025 - 08/2028. Total: \$450K.
A. Gebremedhin (PI), M. Elmahallawy (Co-PI), S. Lapin (Co-PI), and J. Iannelli (Evaluator).
2. *CyberCorps Scholarship for Service: Developing the Next-generation Cyber Workforce.* National Science Foundation, 01/01/2025 - 12/31/2029. Total: \$3.6M
A. Gebremedhin (PI), J. Doppa (Co-PI), M. Hasan (Co-PI), F. Liu (Co-PI).

3. *VICEROY Northwest Institute for CyberSecurity Education and Research (CySER)*. Department of Defense, 06/17/2021 – 07/31/2026. Total: \$2.9M
A. Gebremedhin (PI), B. Van Wie (Co-PI), N. Schulz (Co-PI), S. Adesope (Evaluator).
4. *Interdisciplinary Graduate Training Program in AI and Data Science for Complex Engineering Applications*. Department of Education, Graduate Assistance in Areas of National Need (GAANN) Program, October 2021 – October 2026. Total: \$1.2M.
A. Gebremedhin (PI), V. Arnaoudova (Co-PI), A. Dubey (Co-PI), N. Schulz (Co-PI).
5. *Forecasting and Surveillance of Infectious Threats and Epidemics (ForeSITE)*. Centers for Disease Control (CDC), 09/30/2023 – 09/29/2028. CDC Networks team led by University of Utah. WSU Share: \$4.5M
E. Lofgren (PI), M. Fernandez (Co-I), A. Gebremedhin (Co-I), A. Kalyanaraman (Co-I), E. Schwartz (Co-I), S. Seifert (Co-I), E. Weybright (Co-I).
6. *Harnessing Machine Learning and Social Determinants of Health to Reduce Dementia-related Hospitalizations among Native American and Hispanic People*. Department of Health and Human Services (HHS), 9/16/2024 – 9/15/2026. Total: \$150K.
S. Amiri (PI) and A. Gebremedhin (Co-PI).

Award Under Negotiation:

7. *Secure Distributed Energy Resource Management and Operation: A Holistic Zero-Trust Architecture for 5G-enabled Power Systems (ZTAPS)*. Department of Energy (CESER Program), 12/2024 - 12/2027. Total: \$2.7M. A. Gebremedhin (PI), A. Dubey (Co-PI), M. Hasan (Co-PI), N. Schulz (Co-PI). (Under negotiation since early 2025.)

Completed Projects:

8. *Hierarchical Software Quality Assurance*. Department of Homeland Security, 10/01/2022 – 09/15/2025. Total: \$4.5M. Lead University: Montana State University (MSU) with Cleme Izurieta as PI. WSU Subcontract from MSU: \$862K.
A. Gebremedhin (WSU PI), V. Arnaoudova (WSU Co-PI).
9. *Collaborative Research: EarthCube Capabilities: ICESpark: An Open-Source Big Data Platform for Science Discoveries in the New Arctic and Beyond*. National Science Foundation, 09/01/2021 – 08/31/2025. Collaborative Research with University of Maryland. WSU Share: \$293K. A. Gebremedhin (Current PI), J. Yu (Former PI).
10. *RAPID: Curtailing Nosocomial Amplification of COVID-19*. National Science Foundation, 02/01/2021 – 01/21/2023. Total: \$200K.
E. Lofgren (PI), A. Gebremedhin (Co-PI), S. Rhea (Co-PI).
11. *CAREER: Fast and Scalable Combinatorial Algorithms for Data Analytics*. National Science Foundation, 2016–2022. Total: \$520K. A. Gebremedhin (Single PI).
12. *US-India Collaborative for Smart Distribution System with Storage (UI-ASSIST)*. Department of Energy, 2017–2022. Lead (Team US): N. Schulz, Co-Lead: A. Srivastava. Total US Share: \$7.5M. Role: WSU Co-PI (joined the project after it was funded).
13. *PNNL-WSU Distinguished Graduate Research Program*. Awarded to support my PhD student Xu (Tony) Liu. 2018–2021. Total: \$300K.
14. *Smart Environments: National Science Foundation Research Experience for Under Graduate Students (REU)*. 2015–2017; 2018–2020; PI: Larry Holder. Role: Senior Personnel.

15. *Combinatorial Algorithms to Enable Scientific Computing on Multithreaded Architectures*. Department of Energy, Office of Science, 2013–2015. Total: \$300K.
A. Pothen (PI) and A. Gebremedhin (co-PI).
16. *Combinatorial Algorithms to Enable Derivative Computations on Multicore Architectures*. National Science Foundation, 2012–2015. Total: \$300K.
A. Pothen (PI) and A. Gebremedhin (co-PI).
17. *Combinatorial Scientific Computing and Petascale Simulations (CSCAPES) Institute*. Department of Energy, SciDAC program, 2006–12. Total: \$7M.
A. Pothen (Lead PI), A. Gebremedhin (co-PI), F. Dobrian (co-PI);
E. Boman (Sandia PI), K. Devine (co-PI), B. Hendrickson (co-PI);
P. Hovland (Argonne PI), B. Norris (co-PI), J. Utke (Co-PI); U. Catalyurek (Ohio State PI).
18. *Empowering Computational Science and Engineering via Automatic Differentiation*. National Science Foundation, 2008–2011. Total: \$200K.
A. Pothen (PI) and A. Gebremedhin (co-PI).

TEACHING (COURSES)

- **CptS 317: Automata and Formal Languages.**

An introduction to theory of computation course that is a required core course in most of the majors in EECS, including BS in Computer Science, BS in Software Engineering, and BS in Cybersecurity. Also taken by Computer Engineering, Electrical Engineering, and other majors. Taught the course regularly every Spring semester from 2020 to 2024 and in Fall 2024. Tabulated below are the mean scores of overall instructor and course ratings in student evaluations every semester. The rating scale is 1–5, with 5 being the highest.

Semester	Enrollment	Instructor Evaluation	Course Evaluation
Spring 2020	85	4.4	4.0
Spring 2021	118	4.6	4.3
Spring 2022	118	4.6	4.3
Spring 2023	106	4.7	4.5
Spring 2024	120	4.6	4.4
Fall 2024	104	4.4	4.4

- **CpS 475/575: Data Science** (*Designed course*).

A course I designed from scratch covering fundamental topics in data science. Topics covered include: the Data Science Process, Exploratory Data Analysis, Data Wrangling, Linear Regression, Classification, Principal Components Analysis, Data Visualization, Time-Series Data Mining, Deep Learning, and Data and Ethics. The course was offered as a special topics course under the course number CptS 483 for three semesters from Fall 2015 to Fall 2017. It became a conjoint undergraduate and graduate course under the course number CptS 475/575 in Fall 2018 and has been taught every Fall semester since then. Course participants included upper-level undergraduate students (taking the course as 475) mostly from Computer Science and graduate students (taking the course as 575) from Computer Science, Electrical Engineering, and a wide variety of engineering, physical sciences, biological sciences, and business disciplines from various colleges. CptS 575 is a required core course in the Data Science track of the MS and PhD programs in CS at EECS.

Semester	Enrollment	Instructor Evaluation	Course Evaluation
Fall 2015 (CptS 483)	28	4.4	4.4
Fall 2016 (CptS 483)	27	4.9	4.8
Fall 2017 (CptS 483)	34	4.5	4.4
Fall 2018 (CptS 475/575)	62	4.6	4.6
Fall 2019 (CptS 475/575)	68	4.4	4.5
Fall 2020 (CptS 475/575)	70	4.8	4.7
Fall 2021 (CptS 475/575)	74	4.7	4.6
Fall 2022 (CptS 475/575)	51	4.7	4.6
Fall 2023 (CptS 475/575)	72	4.8	4.7
Fall 2024 (CptS 475/575)	104	4.4	4.4
Fall 2025 (CptS 475/575)	79	4.8	4.7

- **CptS 591: Elements of Network Science** (*Designed course*).

This graduate-level interdisciplinary course introduces fundamental elements of the science of complex networks, with emphasis on social and information networks. Students learn about select mathematical and computational methods used to analyze networks, models used to understand and predict behavior of networked systems, and theories used to reason about network dynamics. Students are also exposed to current research in the field, and they are given an opportunity to explore a chosen topic through a semester project. Topics covered include: Graph Theory Refresher, Network Properties, Random Graphs, Spectral Graph Theory, Centrality, Ranking, Similarity, Signed Networks, Cascading Behaviors, Epidemic Models, Influence Maximization, Community Identification, and Temporal Networks. Students taking the course come from different backgrounds. In a typical semester, I would have most students come from either computer science or electrical engineering and some from disciplines such as sociology, biology, and biological systems engineering.

Semester	Enrollment	Instructor Evaluation	Course Evaluation
Spring 2015	11	4.7	4.4
Spring 2016	21	4.5	4.5
Spring 2017	19	4.4	4.3
Spring 2018	23	4.6	4.5
Spring 2019	31	4.5	4.4
Spring 2020	28	4.5	4.5
Spring 2021	28	4.6	4.5
Spring 2022	22	4.8	4.8
Spring 2023	13	4.6	4.6
Spring 2024	19	5.0	5.0

- **CptS 424: Cyber Law, Ethics, Rights, and Policies** (*Designed Course*), Fall 2025. Co-designed and co-taught this course in its inaugural offering in Fall 2025 teaming up with Sherri Conklin, Assistant Professor of Philosophy in the School of Politics, Philosophy, and Public Policy. The inaugural offering attracted a total of 25 students, 4 of whom were graduate students and the remaining 21 were senior undergraduates majoring in computer science or cybersecurity. Topics covered included: Moral Foundations Theory; The Five Pillars of AI in Society; The Five Pillars of Cybersecurity; Intro to Cyber Law; UN General Assembly on Cybercrimes; US Cybersecurity Policies and Priorities; EU Cybersecurity Policies; The Internet As a Human Right; AI and Cybersecurity; Privacy; Bias; The NIST Cybersecurity Framework 2.0; and Normative Ethical Theories. Coursework included: individual Reflection Paper assignments typically based on case-studies; a team-based Debate; and a team-based Final Project that culminated in submitting a report and doing a presentation in class.

Course evaluation: The course was overall well-received by students as gauged by feedback throughout the semester and an end-of-course survey. The official Blue Course evaluation received an overall mean score of 4.4 for both the instructor and the course.

- **CptS 101: Introduction to Electrical Eng. and Computer Sci.**, Fall 2025.

This is an eight-week, 1-credit course designed to educate new undergraduate students in the resources, knowledge, and skills necessary to succeed in computing related majors within the school of EECS (i.e., Computer Science, Software Engineering, and Cybersecurity). The course is structured as a collection of guest lectures and activities. Students have the opportunity to interact with experts from both academia and industry and learn about how to be successful both as an EECS student and afterwards as a professional. The course is a required course in the BSCS, BSSE, and BSCYBER degree programs and has been offered over the past 2-3 years. It was my first time to teach it in Fall 2025. The course was taught out of the Pullman campus and was streamed to Tri-Cities. The total enrollment was 134 students.

Course evaluation: The Fall 2025 offering received an overall mean rating of 4.2 for the instructor and 3.9 for the course.

- **DATA 424: Data Analytics Capstone** (*Designed course*), Spring 2019.

Designed this inaugural offering of the capstone course for the WSU Data Analytics major. The course aims at providing students with an opportunity to integrate and apply the algorithms, methods, and tools they have learned throughout the program to solve real-world problems that have an interdisciplinary nature. Students conduct a team-based project that involves the main aspects of the data analytics process. The projects for the Spring 2019 inaugural offering were sponsored by United Airlines. Two teams of students (each consisting of four students) worked on two exciting projects, one on prediction of operations injuries and another on employee fatigue analysis. As part of the project the students traveled to San Francisco to visit United's facilities at the airport and better understand the project, the datasets involved, and the business operation of United. They also had the opportunity to travel to Chicago at the end of the semester to present their findings to United executives. Both trips were paid for by United.

Course evaluation: All eight of the students who took the course completed the course evaluation. The overall mean score was 4.5 for the course and 4.2 for the instructor.

CURRICULUM DESIGN

- **BS in Cybersecurity**

Led the effort to design the BS in Cybersecurity degree program at WSU launched in Fall 2023. The curriculum emphasizes hands-on coursework and experiential learning and covers topics on security related to data, software, hardware, connection, cyber systems, and cybersecurity threats impacting organizations and society.

- **Certificate Programs in Cybersecurity**

Designed novel certificate programs to formalize the training students receive in the VICEROY CySER education and training program. In addition to coursework requirements, the certificates involve requirements on participation in seminars, mentored research, summer workshop, and internship.

- *CySER CAE-CO Fundamentals Certificate*: Targeted for BS in Computer Science (or Software Engineering) students interested in specializing in cybersecurity OR students in the new BS in Cybersecurity program.
- *CySER Basics Certificate*: Targeted for non-CS majors interested in cybersecurity.

COMPUTER SCIENCE AND CYBERSECURITY SENIOR DESIGN PROJECTS SPONSORED BY MY LAB

- **Sanitizing Inputs to Protect LLMs Against Prompt Injection Attacks**: Research-oriented project exploring how the data field in a trusted user and model setting can be effectively sanitized to protect against prompt injection attacks unknowingly provided by the user or retrieved by some external Retrieval-augmented generation or similar system.

CS Capstone; Spring 2026 – Fall 2027.

Team: William Fralia, Emily West, Ryan Brombaugh

- **TerTree Guided Geomorphon Substitutions for Optimized Visualization of LiDAR Data**: Research-oriented project exploring whether the TerTree framework (developed by my lab) enables a geomorphon-substitution approach for fast topology visualization of large/dense point cloud datasets. CS Capstone; Fall 2025 – Spring 2026.

Team: Caitlyn Boyd, Kathleen Brickner, Adam Caudle, Fredy Fernandez, and Justin Van Der Sluys

- **Source Code Authorship Attribution and Verification under Adversarial Conditions**: Research-oriented project exploring strategies that attackers might use to obfuscate source code style to have stylometry-based ML models evade or intentionally misattribute authorship predictions. CS Capstone; Fall 2025 – Spring 2026.

Team: Elang Sisson and Andrew Varkey

- **ML-Based Malware Detection with Automated Rationale Documentation for Interpretability**: Research-oriented project exploring the state of XAI tools' capacity to plug into public LLM models for ML classification output semantic interpretability.

Cyber Capstone; Fall 2025.

Team: Puumaaya Tahiru, Sean Hodgson, and Andrew Edson

- **CodeVersion**: A tool for generating multiple versions of a given C/C++ or Python source code file. CS Capstone; Fall 2024 – Spring 2025.

Team: Bryan Frederickson and Samantha Brewer

- **Adversarial Habituation Attacks:** Develop and assess habituation attacks on Network Intrusion Detection Systems. CS Capstone; Fall 2024 – Spring 2025.
Team: Alex Hagood, Guinevere Fish, Zachary Werle, and Yannik Castro
- **Delphi Web Tool:** Designing a web-based tool for conducting Delphi studies to collect Subject Matter Expert input on cybersecurity course design.
CS Capsone; Fall 2024 – Spring 2025.
Team: William Heinecke and Griffin Gerry

PHD THESIS COMMITTEE (CURRENT: 3; GRADUATED: 17)

1. Athul Pulikkottil, Power Engineering, Advisor: Anamika Dubey
Current
2. Ninad Gaikwad, Power Engineering, Advisor: Anamika Dubey
Current
3. Sajjad Mahmud, Power Engineering, Advisor: Anamika Dubey
Current
4. Daniel Glover, Power Engineering, Advisor: Anamika Dubey
Graduated: Final defense passed in Spring 2026
5. Carla De Lira, Computer Science Education, Advisor: Shira Broschat
Graduated: Final defense passed in Spring 2024
6. Arman Ahmed, Power Engineering, Advisor: Anurag Srivastava
Graduated: Final defense passed in Fall 2022
7. Lusha Wang, Power Engineering, Advisors: Noel Schulz and Anamika Dubey
Graduated: Final defense passed in Jan 2022
8. Niloy Patari, Power Engineering, Advisor: Anurag Srivastava
Graduated: Final defense passed in Fall 2021
9. Sumit Purohit, Graph Mining, Advisor: Larry Holder
Graduated: Final defense passed in Spring 2021
10. Peng Lin, Graph Databases, Advisor: Yinghui Wu
Graduated: Final defense passed in Fall 2020
11. Qi Song, Graph Mining, Advisor: Yinghui Wu
Graduated: Final defense passed in Fall 2020
12. Ehdieh Khaledian, Bioinformatics, Advisor: Shira Broschat
Graduated: Final defense passed in Fall 2020
13. Mohammad Hossein Namaki, Graph Databases, Advisor: Yinghui Wu
Graduated: Final defense passed in Fall 2019
14. Abu Chowdhury, Anti Microbial Resistance, Advisor: Shira Broschat
Graduated: Final defense passed in Fall 2019
15. Zhaodong Wang, Transfer Learning, Advisor: Matthew Taylor
Graduated: Final defense passed in Fall 2019
16. Niloofar Hezarjaribi, Diet monitoring, Advisor: Hassan Ghasemzadeh
Graduated: Final defense passed in Fall 2019

17. Daniel Olivares, Human-Computer Interaction, Advisor: Chris Hundhausen
Graduated: Final defense passed in Spring 2019
18. Seyed Ali Rokni, Embedded and Pervasive Computing, Advisor: Hassan Ghasemzadeh
Graduated: Final defense passed in Summer 2018
19. Paola G. Pesantez Cabrera, Graph Algorithms, Advisor: Ananth Kalyanaraman
Graduated: Final defense passed in Spring 2018
20. Hao Lu, Parallel Computing, Advisor: Ananth Kalyanaraman.
Graduated: Final defense passed in Spring 2017

MS THESIS COMMITTEE (GRADUATED: 8)

1. Ninad Gaikwad, Reinforcement Learning, Advisor: Anamika Dubey
Graduated in Fall 2025.
2. Yi Chou, Cybersecurity, Advisor: Monowar Hasan.
Graduated in Summer 2025.
3. Mohammed Mustafa Hussain, Power Engineering, Advisor: Anurag Srivastava.
Graduated in Summer 2021.
4. Zhilla Esna Ashari Esfahani, Active Learning, Advisor: Hassan Ghasemzadeh.
Graduated in Fall 2019.
5. Marjan Nourollahi Darabad, Embedded Systems, Advisor: Hassan Ghasemzadeh.
Graduated in Summer 2019.
6. Nathan Wendt, Social Network Analysis, Advisor: Sandip Roy.
Graduated in Spring 2019.
7. Gabriel De la cruz, Robotics, Advisor: Matt Taylor.
Graduated in Spring 2019.
8. Viresh Duvvuri, Robotics, Advisor: Matt Taylor.
Graduated in Summer 2017.

UNIVERSITY SERVICE (AT WSU)

School Level

- Lead, Assessment of the BS in Cybersecurity major, 2023–present.
- Lead, EECS Undergrad Recruiting Committee, 2019–2023.
- Member, Computing Sciences Curriculum Committee, 2023–present.
- Member, EECS Assessment Committee, 2023–present.
- Member, EECS Graduate Studies Committee (GSC), 2019–2024.
- Member, Cybersecurity Faculty Search Committee, EECS, Pullman campus, 2024–2026.
- Co-Chair, Cybersecurity Faculty Search, Tri-Cities campus, 2023–2025.
- Member, CS Faculty Search Committee, EECS, Pullman campus, 2021–2023.
- Member, EE Faculty Search Committee, EECS, Pullman campus, 2021–2023, 2019–2020
- Member, CS Faculty Search Committee, EECS, Pullman campus, 2015–16.
- Member, Mentoring Committee of several faculty at EECS:
Monowar Hasan (since 2023), Xu Lin (since 2023), Tom Gilray (since 2024)

College Level

- Faculty Advisor, the **Cyber Security Group** student club, 2021–present.

The CSG is a very active student club. Teams from the student club participated in every season of the National Cyber League (NCL) competition since 2022, where they qualified to be ranked and placed in the top 15% of 500 ranked schools. Two of the teams won first place in the 2026 and the 2024 VICEROY National Cyber Competitions. Another team was placed 12th among more than 500 ranked schools in the Fall 2025 season of NCL.

- Member, VCEA Faculty Committee for Undergrad Recruitment, 2020–2023.
- Member, Governance Committee of the Voiland College of Engineering and Architecture HPC cluster Aeolus, 2016–2020.

University Level

- Lead, WSU’s application for National Centers of Academic Excellence in Cybersecurity – Research (CAE-R) designation, 2024–2025.
- Lead, AI Research Working Group, 2024–2025.
- Coordinator, WSU Cybersecurity initiatives, 2022–2024.
- Member, Faculty Senate Academic Affairs Committee (AAC), 2017–2020.
- Member, Committee for PhD in Data Science/Data Analytics, 2021–2023.
- Point-of-Contact, WSU AI Research, 2019 – 2022.
- Member, Data Analytics Faculty Advisory Board, 2020–2022.
- Co-organizer, Distinguished Seminar Series in Data Science, 2015–2016.
- Faculty Mentor, WSU Team Mentoring Program (TMP), 2023–present.
- Faculty Mentor, PNW Louis Stokes Alliance for Minority Participation (LSAMP) at WSU, 2015–present.

PROFESSIONAL SERVICE

Journal Editorial Boards

- *Associate Editor*, Journal of Parallel and Distributed Computing, 2025–Present.

Major Outreach and Engagement Activities

- Organizer, *CySER Seminar Series*, Fall 2021 – present

Bi-weekly virtual seminar series held every semester since Fall 2021. Features cybersecurity expert speakers from government, industry, and academia. The series has thus far run for 10 semesters featuring 54 seminars in total. Slides and recordings of all the seminars are made available on YouTube and the CySER website. More information available at <https://cyser.wsu.edu/seminars>.

- Organizer, *CySER Summer Workshops*, 2022–2026
A weeklong (initially two-weeks long) intensive summer workshop held in the second half of May. Five such workshops have been held in the past five years (2022–2026). Each workshop features a wide variety of presentations, tutorials, panels, and hands-on experiential learning activities on a range of cybersecurity topics. The workshops also feature field trips to locations of interest to the CySER program. Field trips taken in 2026 and 2025 include visits to the Pullman and Moscow campuses of Schweitzer Engineering Laboratories (SEL). In earlier years, trips included visits to the Pacific Northwest National Laboratory in Richmond and Fairchild Air Force Base outside Spokane. Each workshop was held in-person in the Pullman campus of WSU with an option for people to participate virtually. Slides, related material, and recordings of all sessions that took place at each workshop are made available at the CySER website: <https://cyser.wsu.edu/summer-workshop>.
- Panelist, *VICEROY Symposium 2024*
Gave a presentation about CySER at the symposium and participated in a panel discussion about VICEROY Virtual Institutes.
- Moderator, *AI Expo at NCESD STEM Summit 2021*
Moderated a panel discussion titled *AI Jobs of the Future: A conversation about emerging AI jobs and preparing the next generation for these roles*. Video recordings of the panel discussion is available at: <https://youtu.be/29JNBckFvvY>
- Organizer, *Virtual Summit on AI*, 2020
Organized and moderated the event *Advancing AI at WSU: a Virtual AI Summit*, held as a featured event at the 2020 WSU Research Week, October 14, 2020.

Proposal Review/Panel Service

- Panelist, *U.S. National Science Foundation (CISE, ENG, and several cross-cutting programs)*: nearly every year from 2015–2024 (Multiple panels in some years).
- Panelist/Reviewer, *U.S. Department of Energy, Office of Advanced Computing Research*: 2016–2024, 2009. (Multiple panels in some years).
- Reviewer, *Netherland’s Organization for Scientific Research*: 2014, 2008.
- Reviewer, *The French National Research Agency*: 2010.

Recent Conference Program Committee Service

- ACM Technical Symposium on Computer Science Education (SIGCSE TS 2026)
- SIAM Symposium on Algorithm Engineering and Experiments (ALENEX26)
- International European Conference on Parallel and Distributed Computing (EuroPar) (2024)
- 2023 SIAG/ACDA Early Career Prize (Prize Selection Committee Member)
- ACM International Conference on Web Search and Data Mining (WSDM) (2023)
- The WEB Conference/WWW (2023, 2022, 2021, 2020, 2019, 2018)
- Supercomputing 2023
- SIAM Data Mining (2024, 2021, 2020, 2019)

- AAAI 2022 (Senior Program Committee)
- SIAM Conf. on Applied and Computational Discrete Algorithms (ACDA) (2023, 2021)
- Supercomputing I3A Workshop (2021, 2020)
- NeurIPS 2021 Workshop on Differentiable Programming (Organizing Committee)
- SIAM Workshop on Combinatorial Scientific Computing (2020, 2018, 2016 (Co-Chair))
- IEEE Int'l Parallel and Distributed Processing Sym.(IPDPS) (2023, 2018, 2017, 2015)
- IEEE BigData (2018, 2017, 2016)
- IEEE Int'l Conf. on High Perf. Computing, Data, and Analytics (HiPC) (2018, 2017)
- IEEE International Conference on Machine Learning and Applications (ICMLA) (2018)
- ACM Conference on Bioinformatics, Computational Biology and Health Informatics (ACM BCB) (2017)

Select Journal Paper Review (numerous times for most journals)

- *ACM Transactions on Parallel Computing.*
- *ACM Journal on Experimental Algorithmics.*
- *ACM Transactions on Mathematical Software.*
- *ACM Inroads*
- *IEEE Transactions on Parallel and Distributed Systems.*
- *IEEE Transactions on Knowledge and Data Engineering.*
- *IEEE Transactions on Power Systems.*
- *IEEE Transactions on Multi-scale Computing Systems.*
- *SIAM Journal on Scientific Computing.*
- *SIAM Journal on Matrix Analysis and Applications.*
- *The Very Large Databases (VLDB) Journal.*
- *Journal of Parallel and Distributed Computing.*

Book Review

- Chapman & Hall/CRC Press, Statistical Sciences Series, 2017
- Springer Nature, Advanced Information and Knowledge Processing Series, 2016
- SIAM, Frontiers in Applied Mathematics, 2008

PROFESSIONAL MEMBERSHIP

- Senior Member of IEEE
- Member of ACM
- Member of the Society for Industrial and Applied Mathematics (SIAM)
- Member of the SIAM activity groups on: (1) Supercomputing; (2) Applied and Computational Discrete Algorithms; and (3) Data Science.