

Curriculum Vitae

SINAN G. AKSOY

Office Address: Pacific Northwest National Laboratory Email: sinanaksoy90@gmail.com
1100 Dexter Ave N. Website: www.sinanaksoy.com
Suite 500 Phone: 509-375-2564
Seattle, WA 98109 Citizenship: United States

Research Interests

Applied combinatorics and network science, spectral graph theory, stochastic processes on graphs, randomized algorithms, mathematics of data science.

Education

- 2014 – 2017 **Ph.D., Mathematics**, University of California, San Diego.
 Advisor: Fan Chung Graham
- 2012 – 2014 **M.A., Applied Mathematics**, University of California, San Diego.
- 2008 – 2012 **B.A., Mathematics, B.A., Economics** University of Chicago.
 General Honors

Professional Experience

- 2019 – **Senior Data Scientist**, Pacific Northwest National Laboratory
- 2022 – 2024 **Manager**, Mathematics of Data Science Team, Pacific Northwest National Laboratory
- 2017 – 2019 **Data Scientist**, Pacific Northwest National Laboratory
- 2016 Sum. **Intern**, Pacific Northwest National Laboratory.
- 2015 Fall **Visiting Scholar**, National Taiwan University, Mathematics Division NCTS.
- 2015 Sum. **Intern**, Sandia National Laboratories, Livermore.

Journal Articles

- 2024 46. S. Aksoy, H. Jenne, E. Purvine, S. Young, *Rapid Generation and Parameter Recovery of Correlated Temporal Graphs*, in preprint.
45. T. Benko, M. Buck, I. Amburg, S. Young, S. Aksoy, *HyperMagNet: A Magnetic Laplacian based Hypergraph Neural Network*, submitted, 2024, [arXiv:2402.09676](https://arxiv.org/abs/2402.09676)
44. J. Niu, I. Amburg, S. Aksoy, A.E. Sariyuçe, *Size-aware hypergraph motifs*, submitted, 2024, [arXiv:2311.07783](https://arxiv.org/abs/2311.07783)
43. K. Hayashi, S. Aksoy, G. Ballard, H. Park, *Randomized algorithms for symmetric nonnegative matrix factorization*, submitted, 2024, [arXiv:2402.08134](https://arxiv.org/abs/2402.08134)
42. B. Praggastis, S. Aksoy, D. Arendt, M. Bonicillo, C. Joslyn, E. Purvine, M. Shapiro, J. Yun *HyperNetX: A Python package for modeling complex network data as hypergraphs*, J. Open Source Software (JOSS), **9**(95), 2024, [DOI: 10.21105/joss.06016](https://doi.org/10.21105/joss.06016)
41. J. Eshun, N. Lamar, S. Aksoy, S. Akers, B. Garcia, H. Cunningham, G. Chin Jr., J. Bilbrey, *Identifying Sample Provenance from SEM/EDS Automated Particle Analysis via Few-shot Learning coupled with Similarity Graph Clustering*, Microscopy and Microanalysis, **30** (4):741–750 2024, [DOI: 10.1093/mam/ozae068](https://doi.org/10.1093/mam/ozae068)
40. S. Aksoy, I. Amburg, S. Young, *Scalable tensor methods for nonuniform hypergraphs*, SIAM J. Mathematics of Data Science, **6**(2):481–503, 2024, [DOI: 10.1137/23M1584472](https://doi.org/10.1137/23M1584472)
39. N. Landry, I. Amburg, M. Shi, S. Aksoy, *Filtering higher-order datasets*, J. Phys. Complex., **5**(1), 2024, [DOI: 10.1088/2632-072X/ad253a](https://doi.org/10.1088/2632-072X/ad253a)

- 2023 38. S. Aksoy, R. Bennink, Y. Chen, J. Frias, Y. Gel, B. Kay, U. Naumann, C. Marrero, A. Petyuk, S. Roy, I. Segovia-Dominguez, N. Veldt, S. Young *Seven open problems in applied combinatorics*, Journal of Combinatorics, **14** (4):559–601, 2023, DOI: [10.4310/JOC.2023.v14.n4.a8](https://doi.org/10.4310/JOC.2023.v14.n4.a8)
- 2021 37. S. Aksoy, E. Purvine, S. Young, *Directional Laplacian centrality for cyber situational awareness*, Digital Threats: Research & Practice, **2** (4):1–28, 2021, DOI: [10.1145/3450286](https://doi.org/10.1145/3450286)
36. S. Aksoy, M. Kempton, S. Young, *Spectral threshold for extremal cyclic edge-connectivity*, Graphs and Combinatorics, 1–15, 2021, DOI: [10.1007/s00373-021-02333-6](https://doi.org/10.1007/s00373-021-02333-6)
- 2020 35. S. Aksoy, C. Joslyn, C. Ortiz-Marrero, B. Praggastis, E. Purvine, *Hypernetwork science via high-order walks*, EPJ Data Science, **9**(16), 2020, DOI: [10.1140/epjds/s13688-020-00231-0](https://doi.org/10.1140/epjds/s13688-020-00231-0)
34. S. Aksoy, P. Bruillard, S. Young, M. Raugas, *Ramanujan graphs and the spectral gap of supercomputing topologies*, Journal of Supercomputing, DOI: [10.1007/s11227-020-03291-1](https://doi.org/10.1007/s11227-020-03291-1)
- 2019 33. S. Aksoy, K. Nowak, E. Purvine, S. Young, *Relative Hausdorff distance for network analysis*, Applied Network Science, **4**(80), 2019, DOI: [10.1007/s41109-019-0198-0](https://doi.org/10.1007/s41109-019-0198-0)
32. S. Aksoy, K. Nowak, S. Young, *A linear-time algorithm and analysis of graph Relative Hausdorff distance*, SIAM J. Mathematics of Data Science, **1**(4):647–666, 2019, DOI: [10.1137/19M1248224](https://doi.org/10.1137/19M1248224)
- 2018 31. S. Aksoy, F. Chung, M. Tait, J. Tobin, *The maximum relaxation time of a random walk*, Advances in Applied Mathematics, **101**:1–14, 2018, DOI: [10.1016/j.aam.2018.07.002](https://doi.org/10.1016/j.aam.2018.07.002)
30. S. Aksoy, E. Purvine, E. Cotilla-Sanchez, M. Halappanavar, *A generative graph model for electrical infrastructure networks*, Journal of Complex Networks, **7**(1):128–162, DOI: [10.1093/com-net/cny016](https://doi.org/10.1093/com-net/cny016)
- 2017 29. S. Aksoy, T. G. Kolda, A. Pinar, *Measuring and modeling bipartite graphs with community structure*, Journal of Complex Networks, **5**(4):581–603, 2017, DOI: [10.1093/comnet/cnx001](https://doi.org/10.1093/comnet/cnx001)
- 2016 28. S. Aksoy, F. Chung, X. Peng, *Extreme values of the stationary distribution of random walks on directed graphs*, Advances in Applied Mathematics, **81**:128–155, 2016, DOI: [10.1016/j.aam.2016.06.012](https://doi.org/10.1016/j.aam.2016.06.012)
27. S. Aksoy, P. Horn, *Graphs with many strong orientations*, SIAM J. Discrete Math., **30**(2):1269–1282, 2016, DOI: [10.1137/15M1018885](https://doi.org/10.1137/15M1018885)
- 2015 26. S. Aksoy, A. Azzam, C. Coppersmith, J. Glass, G. Karaali, X. Zhao, X. Zhu, *Coalitions and cliques in the school choice problem*, Involve, **8**(5):801–823, 2015, DOI: [10.2140/involve.2015.8.801](https://doi.org/10.2140/involve.2015.8.801)
- 2012 25. S. Aksoy, S. Nelson, *Bikei, involutory biracks, and unoriented link invariants*, Journal of Knot Theory and Its Ramifications, **21**(6):13 pp., 2012, DOI: [10.1142/S0218216511009972](https://doi.org/10.1142/S0218216511009972)

Refereed Conference & Workshop Proceedings

- 2023 24. S. Shivakumar, I. Amburg, S. Aksoy, S. Aluru, J. Li, S. Young, *Fast Parallel Tensor Times Same Vector for Hypergraphs*, 2023 IEEE Conference on High Performance Computing, Data, & Analytics (HiPC), 2023, DOI: [10.1109/HiPC58850.2023.00049](https://doi.org/10.1109/HiPC58850.2023.00049)
23. A. Myers, A. Bittner, S. Aksoy, D. Best, G. Roek, H. Jenne, C. Joslyn, B. Kay, G. Seppala, S. Young, E. Purvine, *Malicious cyber activity detection using zigzag persistence*, 2023 IEEE Conference on Dependable and Secure Computing (DSC), 2023, DOI: [10.1109/DSC61021.2023.10354204](https://doi.org/10.1109/DSC61021.2023.10354204)
22. J. Follum, S. Aksoy, S. Bhadra, J. Buckheit, N. Betzold, T. Yin, T. Becejac, *The Circular Variance as a Visual Summary of Synchronized Voltage Angle Measurements*, Proceedings of the 56th Hawaii International Conference on System Sciences, p. 2612-2621, 2023, URI: [10.125/102954](https://doi.org/10.125/102954)
- 2022 21. K. Hayashi, S. Aksoy, H. Park, *Skew-symmetric adjacency matrices for clustering directed graphs*, 2022 IEEE International Conference on Big Data, pp. 555-564, DOI: [10.1109/Big-Data55660.2022.10020413](https://doi.org/10.1109/Big-Data55660.2022.10020413)

20. B. Kay, S. Aksoy, M. Baird, D. Best, H. Jenne, C. Joslyn, C. Potvin, G. Henselman-Petrusek, G. Seppala, S. Young, E. Purvine, *Hypergraph Topological Features for Autoencoder-Based Intrusion Detection for Cybersecurity Data*, 2022 ICML Workshop on Machine Learning for Cybersecurity, 2022, [arXiv:2312.00023](https://arxiv.org/abs/2312.00023)
19. X. Liu, J. Firoz, S. Aksoy, I. Amburg, A. Lumsdaine, C. Joslyn, B. Praggastis, A. Gebremedhin, *High-order Line Graphs of Non-uniform Hypergraphs: Algorithms, Applications, and Experimental Analysis*, IEEE International Parallel and Distributed Processing Symposium (IPDPS), p. 784-794, 2022, [DOI: 10.1109/IPDPS53621.2022.00081](https://doi.org/10.1109/IPDPS53621.2022.00081)
18. S. Aksoy, S. Young, J. Firoz, R. Gioiosa, M. Raugas, J. Contreras, J. Wilke, *SpectralFly: Ramanujan Graphs as Flexible and Efficient Interconnection Networks*, IEEE International Parallel and Distributed Processing Symposium (IPDPS), p. 1040-1050, 2022, [DOI: 10.1109/IPDPS53621.2022.00105](https://doi.org/10.1109/IPDPS53621.2022.00105)
- 2021 17. S. Roy, S. Aksoy, S. Sarker, P. Weng, S. Young, *Structural Controllability Assessment for Inverter-Based Microgrids*, The 53rd North American Power Symposium (NAPS 2021), p. 1-6, 2021, [DOI: 10.1109/NAPS52732.2021.9654687](https://doi.org/10.1109/NAPS52732.2021.9654687)
16. X. Liu, J. Firoz, A. Lumsdaine, C. Joslyn, S. Aksoy, B. Praggastis, A. Gebremedhin, *Parallel Algorithms and Heuristics for Efficient Computation of High-Order Line Graphs of Hypergraphs*, HiPC 2021: 28th IEEE Conference on High Performance Computing, Data, & Analytics, p. 312-321, 2021, [DOI: 10.1109/HiPC53243.2021.00045](https://doi.org/10.1109/HiPC53243.2021.00045)
- 2020 15. K. Hayashi, S. Aksoy, C. Park, H. Park, *Hypergraph random walks, Laplacians, and clustering*, Proceedings of the 29th ACM International Conference on Information & Knowledge Management., p. 495-504, 2020, [DOI: 10.1145/3340531.3412034](https://doi.org/10.1145/3340531.3412034)
14. C. Joslyn, S. Aksoy, D. Arendt, L. Jenkins, B. Praggastis, E. Purvine, M. Zalewski, *Hypergraph Analytics of Domain Name System Relationships*, Workshop on Algorithms and Models for the Web Graph, p. 1-15, 2020, [DOI: 10.1007/978-3-030-48478-1_1](https://doi.org/10.1007/978-3-030-48478-1_1)
13. C. Joslyn, S. Aksoy, T. Callahan, L. Hunter, B. Jefferson, B. Praggastis, E. Purvine, I. Tripodi, *Hypernetwork Science: From Multidimensional Networks to Computational Topology*, 2020 International Conference on Complex Systems, in Unifying Themes on Complex Systems, p. 377-392 [DOI: 10.1007/978-3-030-67318-5_25](https://doi.org/10.1007/978-3-030-67318-5_25)
12. X. Fan, S. Aksoy, D. Wang, Q. Huang, J.P. Ogle, A. Tbaileh, R. Huang, *Automated Realistic Testbed Synthesis for Power System Communication Networks based on Graph Metrics*, 2020 IEEE Conference on Innovative Smart Grid Technologies North America, [DOI: 10.1109/ISGT45199.2020.9087672](https://doi.org/10.1109/ISGT45199.2020.9087672)
- 2018 11. L. Jenkins, T. Bhuiyan, S. Harun, C. Lightsey, D. Mentgen, S. Aksoy, T. Stavenger, M. Zalewski, H. Medal, C. Joslyn, *Chapel HyperGraph Library (CHGL)*, 2018 IEEE High Performance Extreme Computing Conference (HPEC 18), [DOI: 10.1109/HPEC.2018.8547520](https://doi.org/10.1109/HPEC.2018.8547520)
10. E. Purvine, S. Aksoy, C. Joslyn, K. Nowak, B. Praggastis, M. Robinson, *A topological approach to representational data models*, In International Conference on Human Interface and the Management of Information, pp. 90-109. Springer, Cham, [DOI: 10.1007/978-3-319-92043-6_8](https://doi.org/10.1007/978-3-319-92043-6_8)
- 2012 9. S. Aksoy, A. Azzam, C. Coppersmith, J. Glass, G. Karaali, X. Zhao, X. Zhu, *School Choice as a One-Sided Matching Problem: Cardinal Utilities and Optimization*, 2012 International Symposium on Artificial Intelligence, [arXiv:1304.7413](https://arxiv.org/abs/1304.7413)

Technical Reports & Book Chapters

- 2023 8. S. Volkova, D. Arendt, E. Saldanha, M. Glenski, E. Ayton, J. Cottam, S. Aksoy, B. Jefferson, K. Shrivaram, *Explaining and predicting human behavior and social dynamics in simulated*

- virtual worlds: reproducibility, generalizability, and robustness of causal discovery methods*, Computational and Mathematical Organization, 2023, DOI: [10.1007/s10588-021-09351-y](https://doi.org/10.1007/s10588-021-09351-y)
- 2020 7. S. Aksoy, J. Taft, *Connectivity, Centrality, and Bottleneckedness: On Graph Theoretic Methods for Power Systems*, Tech. Rep. PNNL-29662, [PDF](#)
- 2019 6. X. Fan, S. Aksoy, Q. Huang, J.P. Ogle, D. Wang, A. Tbaileh, and T. Fu, *Coordination of Transmission, Distribution and Communication Systems for Prompt Power System Recovery after Disasters Report*, Tech. Rep. PNNL-28598, [PDF](#)
5. Q. Huang, A. Tbaileh, S. Sharma, Q. Li, S. Aksoy, X. Fan, and R. Huang, *Mechanisms and data needed for coordinating restoration*, PNNL Tech. Rep. PNNL-28387

Expository Articles

- 2024 4. H. Jenne, S. Aksoy, B. Best, A. Bittner, G. Henselman-Petrusek, C. Joslyn, B. Kay, A. Myers, G. Seppala, J. Warley, S. Young, E. Purvine, *Stepping Out of Flatland: Discovering Behavior Patterns as Topological Structures in Cyber Hypergraphs*, The Next Wave: NSA's Review of Emerging Technologies, Vol. 25, No. 1, 2024, [PDF](#)
- 2023 3. S. Aksoy, R. Gioiosa, M. Raugas, S. Young, *Expanding the Horizon: The Future of HPC Networking is Bottleneck-Free Topologies*, The Next Wave: NSA's Review of Emerging Technologies, Vol. 24, No. 1, 2023, [PDF](#)
- 2022 2. S. Aksoy, *Advice From Our Advisor: Fan Chung*, Notices of the American Mathematical Society, 2022, DOI: [10.1090/noti2441](https://doi.org/10.1090/noti2441)
- 2021 1. S. Aksoy, A. Hagberg, C. Joslyn, B. Kay, E. Purvine, S. Young, *Models and Methods for Sparse (Hyper)Network Science in Business, Industry and Government*, Notices of the American Mathematical Society, 2021, DOI: [10.1090/noti2424](https://doi.org/10.1090/noti2424)

Software

- **GENTTSV: Tensor Algorithms for Nonuniform Hypergraphs** (Python) – Scalable tensor-times-same-vector algorithms for nonuniform hypergraph adjacency tensors, contributor.
- **Hyperedge-Triplets** (Python) – Hypergraph motif mining algorithms, contributor.
- **HyperNetX** (Python) – Hypergraph visualization and exploratory data analytics, contributor.
- **Chapel Hypergraph Library** (Chapel) – Scalable hypergraph generation & analysis, contributor.
- **Relative Hausdorff Distance** (Python) – linear time algorithm (`rh.distance`) for computing Relative Hausdorff distance between graphs, co-author
- **Transactive Energy Simulation Platform** (Python) – Valuation and simulation of energy market mechanisms and participants, contributor.

Patents

- **Methods and Systems for Evaluating Data Transportability in Distribution Grids**, Determination of Transportability Index, Patent No.: US 11,637,756 B2, 2023, [PDF](#)

Professional Service

- **Conference Session Organizer**
 - *Mathematics of Knowledge Graphs: Theory and Application*, Joint Mathematics Meetings (2025), [\[link\]](#)
 - *Combinatorics for Science*, Joint Mathematics Meetings (2024), [\[link\]](#)

- *Network Science Beyond Graphs*, SIAM Conference on Discrete Mathematics (2024), [\[link\]](#)
- *Hypergraph Random Walks, Random Models, and Spectral Theory*, SIAM Conference on Discrete Mathematics (2022), [\[link\]](#)
- *Applied Combinatorial Methods*, Joint Mathematics Meetings (2022), [\[link\]](#)
- *Graph Theory and its Applications*, Canadian Math Society Winter Meeting (2021), [\[link\]](#)
- *Applied Combinatorial Methods*, Joint Mathematics Meetings (2021), [\[link\]](#)
- **Workshop Organizer**
 - *Software for Tensor-based Analysis of General Hypergraphs*, SIAM Conference on Mathematics of Data Science (2024), [\[link\]](#)
 - *Models and Methods for Sparse (Hyper)Network Science*, AMS Mathematics Research Communities (2022), [\[link\]](#)
- **Editorial & Program Committee Work**
 - Program Committee: 12th International Conference on Complex Networks and their Applications (2023), [\[link\]](#)
 - Guest Editor: Journal of Combinatorics, Special Issue on Applied Combinatorial Methods (2023), Vol 14, No. 4, [\[link\]](#)
- **Referee & Reviewer**: Notices of the AMS, Journal of Combinatorics, Theoretical Computer Science, Linear Algebra & Applications, Graphs & Combinatorics, SIAM J. Math Data Science, SIAM Undergraduate Research Online, Journal of Algebraic Combinatorics, Ars Combinatoria, Network Science, Mathematical Reviews, MathSciNet
- **Graduate Student Association Representative**, UC San Diego Math Department (2015-2016)
- **Webmaster**, “Erdős’ Problems on Graphs” [website](#) (2014-2015)

Talks

- 2024 Oct. **SIAM Math of Data Science** (Session on Data Science for Science)
Invited Talk: *Mathematics for Data Science*
- Oct. **Washington State University Everett** (Industry Mentor Workshop)
Invited Panelist: *Data Analytics in Government*
- Sep **University of Bristol** (Graph Similarity Workshop)
Invited Talk: *Relative Hausdorff Distance for Graph Similarity*
- Jan. **Joint Math Meetings** (ILAS Session on Graphs & Matrices)
Invited Talk: *Scalable tensor methods for nonuniform hypergraphs*
- Jan. **Joint Math Meetings** (Applications of Extremal Graph Theory to Network Design)
Invited Talk: *Spectral Threshold for Extremal Cyclic Edge-Connectivity*
- 2022 Nov. **North Carolina State University** (Algebra & Combinatorics Seminar)
Invited Talk: *Non-reversible Markov Chains and Hypergraph Data Analysis*
- May **North Carolina State University** (Laboratory for Analytic Sciences Exchange)
Invited Talk: *Tractable, Applicable Hypergraph-Native Data Analysis*
- 2021 Aug. **Pacific Northwest National Laboratory** (Mathematics for Biology Bootcamp)
Invited Talk: *Graph Theory for Data Science*
- Jun. **Graduate Research Workshop in Combinatorics** (Professional Development Event)
Invited Panelist: *Industry Careers for Mathematicians*
- 2020 Dec. **University of Washington** (Probability Seminar)
Invited Talk: *Random walks on graphs and hypergraphs: eigenvalues and clustering*
- Oct. **AMS Fall Western Sectional** (Session on Graphs and Matrices)
Invited Talk: *Hypergraph random walks, Laplacians, and clustering*

- Oct. **University of Washington** (Applied Mathematics Seminar)
Invited Talk: *Random walks on graphs and hypergraphs: eigenvalues and clustering*, [\[video\]](#)
- 2019 Sep. **AMS Fall Central Sectional** (Session on Combinatorics, Functions and Logic)
The maximum relaxation time of a random walk
- 2018 Jan. **AMS Joint Math Meetings** (Special Session: Applied and Computational Combinatorics)
Invited Talk: *A generative graph model for electrical infrastructure networks*.
- 2017 June **UC San Diego** (Final Defense)
Random walks on directed graphs and orientations of graphs.
- Apr. **AMS Sectional**, Washington State University (Clustering of Graphs: Theory & Practice)
Invited Talk: *Measuring and modeling bipartite graphs with community structure*.
- 2016 Nov. **Purdue University** (Geometry Seminar)
Invited Talk: *Problems in the spectral theory of directed and oriented graphs*.
- Oct. **AMS Fall Sectional**, University of Denver (Analysis on Graphs & Spectral Graph Theory)
Invited Talk: *Extreme values of the stationary distribution of random walks on directed graphs*.
- Aug. **Pacific Northwest National Laboratory** (NSIP Symposium)
A generative graph model for the power-grid.
- June **UC San Diego** (Stochastic Networks Conference: Short Talk & Poster Session)
Extreme values of the stationary distribution of random walks on directed graphs.
- Feb. **Claremont Colleges** (Algebra, Number Theory, & Combinatorics Seminar)
Invited Talk: *Strong orientations of graphs and Cheeger's inequality*.
- UC San Diego** (Advancement to Candidacy Seminar)
Two problems on the spectral theory of directed graphs
- Jan. **AMS Joint Math Meetings** (Special Session on Research from the GRWC)
Invited Talk: *Graphs with many strong orientations*.
- 2015 Sep. **Sandia National Laboratories, Livermore** (Seminar)
A generative bipartite graph model with affiliation structure.
- 2014 Aug. **University of Denver** (Graduate Research Workshop Open Problem Seminar)
The connectivity of randomly oriented graphs.
- 2010 July **Pomona College** (NSF-funded REU Seminar)
Game theory in school choice.

Teaching and Interns

- 2019– **Intern Supervisor**, Pacific Northwest National Laboratory
- Martin Buck (graduate), Tufts University, Summers 2022-2024
 - Tatyana Benko (graduate), University of Oregon, Summer 2022-2024
 - Jason Niu (graduate), University of Buffalo, Summers 2022, 2024
 - Nicholas Landry (graduate), University of Colorado Boulder, Fall 2021
 - Ilya Amburg (graduate), Cornell University, Summer 2021
 - Mirah Shi (undergraduate), Barnard College, Summer 2021
 - Sankar Harilal (high school), Hanford High School, Summer 2021
 - Terran Mott (undergraduate), Grinnell College Summer 2019
- 2020 **Research Group Lead**, Washington Experimental Math Lab, University of Washington
Mentees: Haley Riggs, Chuan Shi, Jiaqi Su
- 2016–2017 **Head Teaching Assistant**, UC San Diego Math Department
Responsibilities: training and evaluating new TAs, serving as a first point of contact for conflicts and grievances, representing graduate students in departmental affairs.

2012–2016 **Teaching Assistant**, UC San Diego Math Department
12 Courses: Discrete Math & Graph Theory, Combinatorics, Complex Analysis, Mathematical Reasoning, Linear Algebra, Calculus and Analytic Geometry, Calculus I-III.

Fellowships and Awards

2019 **Author of the Year**, Pacific Northwest National Laboratory, National Security Directorate
2016 Jun. **Outstanding Poster Award**, Stochastic Networks Conference
2013–2014 **Graduate Student Research Fellowship**, UC San Diego
2012–2013 **Graduate Assistance in Areas of National Need Fellowship**, UC San Diego
2012–2013 **M. Salah Baouendi Graduate Fellowship**, UC San Diego
2012 Jun. **General Honors**, University of Chicago