Sara Shashaani, Ph.D.

Assistant Professor and Bowman Faculty Scholar of Industrial and Systems Engineering and Operations Research
2024-25 Goodnight Early Career Innovator
North Carolina State University

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EMPLOYMENT

North Carolina State University (NCSU), Raleigh, NC 2019 – present
Assistant Professor, Edward P. Fitts Department of Industrial and Systems Engineering (ISE)
ISE Bowman Faculty Scholar
Associated Faculty, Graduate Program in Operations Research (OR)
Affiliated Faculty, Center for Additive Manufacturing and Logistics (CAMAL)
Research Methodology:

1. Efficiency and Reliability of Simulation(-based) Optimization Algorithms
2. Monte Carlo Simulation Methods for Robust and Interpretable Machine Learning
3. Uncertainty-aware Prediction and Decision-making using Big Data and Digital Twins

Research Applications:

1. Climate-resilient Infrastructure (Renewable Energy, Coasts, Agriculture) Operations Control
2. Data-driven Electron-beam Manufacturing Defect Prevention
3. Personalized Hospitalization Risk Prediction

University of Michigan, Ann Arbor, MI 2016 – 2018
Postdoctoral Research Fellow, Department of Industrial and Operations Engineering (IOE)
Research Methodology: Calibration of Predictive Models using Score Functions
Research Application: Model Improvement for Power Outage Prediction During Hurricanes

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EDUCATION

Ph.D. in Industrial Engineering 2016
Purdue University, West Lafayette, IN
Dissertation: *Adaptive Sampling Trust-region Methods for Derivative-based and Derivative-free Simulation Optimization Problems*
Advisor: Raghu Pasupathy
Committee: Susan Hunter, Mohit Tawarmalani, Hong Wan

M.S. in Industrial and Systems Engineering & Operations Research 2014
Virginia Tech, Blacksburg, VA

M.S. in Industrial Engineering 2011
Purdue University, West Lafayette, IN
Thesis: *Chemotherapy Patient Scheduling and Uncertainty*
Advisor: Mark Lawley
Committee: Vincent Duffy, Hong Wan

B.S. in Applied Computing 2009
Southern Cross University, Brisbane, Australia (Off-shore)

B.S. in Industrial Engineering 2008
Iran University of Science and Technology (IUST), Tehran, Iran

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CERTIFICATES

Certificate of Computational Engineering, Purdue University 2015

Certified Computer Professional, Aptech Worldwide IT Education 2008

Proficiency in Information Systems Management, Aptech Worldwide IT Education 2007

PUBLICATIONS (* indicates the co-author is a student under my direct supervision when writing the article.)

Published and Accepted Journal Papers

1. *Ha, Y., Shashaani, S., and Menickelly, M., Two-stage Estimation and Variance Modeling for Latency-constrained Variational Quantum Algorithms, *INFORMS Journal of Computing*, 2024. https://doi.org/10.1287/ijoc.2024.0575.
2. *Jain, P., Shashaani, S., and Byon, E., Simulation Model Calibration with Dynamic Stratification and Adaptive Sampling, *Journal of Simulation*, 2024. https://doi.org/10.1287/10.1080/17477778.2024.2420807.
3. *Jeon, Y., Chu, Y., Pasupathy, Y., and Shashaani, S., Uncertainty Quantification using Simulation Output: Batching as an Inferential Device, *Journal of Simulation*, 2024. https://doi.org/10.1287/10.1080/17477778.2024.2425311.
4. Park J., Byon E., Ko Y.M., and Shashaani S., Strata Design for Variance Reduction in Stochastic Simulation, *Technometrics*, 2024. https://doi.org/10.1080/00401706.2024.2416411.
5. Shashaani, S., Eckman, D.J., Sanchez, S., Data Farming the Parameters of Simulation-Optimization Solvers, *ACM Transactions on Modeling and Computer Simulation (TOMACS)*, 2024. https://doi.org/10.1145/368028.
6. Alizadeh, N., *Vahdat, K., Shashaani, S., Özaltin, O., Swann, J., Risk Score Models for Urinary Tract Infection Hospitalization, *Plos ONE*, 2024. https://doi.org/10.1371/journal.pone.0290215.
7. *Ha, Y., Shashaani, S., Iteration Complexity and Finite-Time Efficiency of Adaptive Sampling Trust-Region Methods for Stochastic Derivative-Free Optimization, *IISE Transactions*, 2024. https://doi.org/10.1080/24725854.2024.2335513.
8. Shashaani, S., Sürer, Ö., Plumlee, M. and Guikema, S. D., Building Trees for Probabilistic Prediction via Scoring Rules, *Technometrics*, 2024. https://doi.org/10.1080/00401706.2024.2343062.
   (Journal Editor's Choice for Fall Technical Conference Technometrics Session)
9. *Jain, P., Shashaani, S., and Byon, E., Wake Effect Parameter Calibration with Large-Scale Field Operational Data using Stochastic Optimization, *Applied Energy* 347: 121426, 2023. https://doi.org/10.1016/j.apenergy.2023.121426
10. *Houser, E., Shashaani, S., Harrysson, O., and *Jeon, Y., Predicting Additive Manufacturing Defects with Feature Selection for Imbalanced Data, *IISE Transactions*, 2023. https://doi.org/10.1080/24725854.2023.2207633
    (Feature Article, Industrial and Systems Engineer Magazine, August 2024 Issue)
11. Eckman, D.J., Henderson, S.G., Shashaani, S., SimOpt: A Testbed for Simulation-Optimization Experiments, *INFORMS Journal on Computing*, 35(2):495-508, 2023. https://doi.org/10.1287/ijoc.2023.1273
12. Eckman, D.J., Henderson, S.G., Shashaani, S., Diagnostic Tools for Evaluating and Comparing Simulation-Optimization Algorithms, *INFORMS Journal on Computing*, 35(2):350-367, 2023. https://doi.org/10.1287/ijoc.2022.1261
13. Shashaani, S., *Vahdat, K., Simulation Optimization based Feature Selection, *Optimization and Engineering*, 24:1183–1223, 2023. https://doi.org/10.1007/s11081-022-09726-3.
14. *Chen, T.Y.J., Beekman, J.A., Guikema, S.D., and Shashaani, S., Statistical Modeling in Absence of System Specific Data: Exploratory Empirical Analysis for Prediction of Water Main Breaks. *Journal of Infrastructure Systems*, 25(2): 04019009, 2019. https://doi.org/10.1061/(ASCE)IS.1943-555X.0000482
15. Shashaani, S., Guikema, S.D., Pino, J.V. and Quiring, S.M., Multi-Stage Prediction for Zero-Inflated Hurricane Induced Power Outages. *IEEE Access*, 6: 62432-62449, 2018. 2018. https://doi.org/10.1109/ACCESS.2018.2877078

16. Shashaani, S., Hashemi, F.S. and Pasupathy, R., ASTRO-DF: A Class of Adaptive Sampling Trust-region Algorithms for Derivative-free Stochastic Optimization, *SIAM Journal on Optimization*, 28(4): 3145-3176, 2016. `https://doi.org/10.1137/15M1042425`
17. Nsoesie, E.O., Beckman, R.J., Shashaani, S., Nagaraj, K.S., Marathe, M.V., A Simulation Optimization Approach to Epidemic Forecasting, *PLos ONE*, 8(6): e67164, 2013. `https://doi.org/10.1371/journal.pone.0067164`
18. Mazdeh, M.M., Shashaani, S., Ashouri, A., Hindi, K.S., Single-machine Batch Scheduling Minimizing Weighted Flow Times and Delivery Costs, *Applied Mathematical Modelling*, 35(1): 563-570, 2011. `https://doi.org/10.1016/j.apm.2010.07.023`

Journal Papers Under Review

19. *Ha, Y., Shashaani, S., and Pasupathy, R., Complexity of Zeroth- and First-order Stochastic Trust-Region Algorithms, Under Second Review (Minor Revisions) at *SIAM Journal on Optimization*, arXiv preprint `http://arxiv.org/abs/2405.20116`.
20. *Eun, H., Shashaani, S., and Vahdat, K., Robust Learning and Simulation with Efficient Bias Correction, Submitted to *Operations Research*, arXiv preprint `http://arxiv.org/abs/2207.13612`.

Working Papers (expected submission date within 1-6 months)

21. Shashaani, S., Dzahini, J., Cartis, C., Randomized Subspaces for Derivative-free Adaptive Sampling Trust-region Optimization, expected submission, Dec 2024.
22. *Ha, Y., Shashaani, S., and Tran-dinh, Q., Regularized Trust-region Algorithms with $\mathcal{O}(\epsilon^{-3/2})$ for Stochastic Optimization, expected Submission, Jan 2025.
23. *Jain, P., Shashaani, S. Efficiency Analysis of Simulation Optimization with Dynamic Stratification, expected submission, Jan 2025.
24. Kushwaha, A., Shashaani, S., and Kemper, A., Robust Variational Quantum Algorithms and Hamiltonian Uncertainty, expected submission, Feb 2025.
25. Eckman, D.J., Sanchez, S., Shashaani, S., Data Farming for Sequential Optimization Algorithms, expected submission, Feb 2025.
26. *Felice, N., Eckman, D., Shashaani, S., and Henderson, S., Unified Evaluation Metrics for Simulation Optimization with Stochastic Constraints, expected submission, Mar 2025.
27. *Eun, H. K., Shashaani, S., and Barton, R., Distributionally Robust Decisions for Queues using Kingman Distances, expected submission, Mar 2025.
28. *Houser, E. and Shashaani, S., Robust Convergent Discrete Simulation Optimization with Nested Partitioning, expected submission, Apr 2024.

Published Peer-reviewed Proceedings

1. Shashaani, S., Simulation Optimization: An Introductory Tutorial on Methodology. In *Proceedings of the 2024 Winter Simulation Conference*, edited by H. Lam, E. Azar, D. Batur, W. Xie, S.R. Hunter, and M. D. Rossetti. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. In Press.
2. *Felice, N., Shashaani, S., Eckman, D.E., and Sanchez, S.S., Data Farming for Repeated Simulation Optimization Experiments. In *Proceedings of the 2024 Winter Simulation Conference*, edited by H. Lam, E. Azar, D. Batur, W. Xie, S.R. Hunter, and M. D. Rossetti. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. In Press.
3. *Jeon, Y., and Shashaani, S., Digital Twin Calibration with Root Finding and Bayesian Optimization. In *Proceedings of the 2024 Winter Simulation Conference*, edited by H. Lam, E. Azar, D. Batur, W. Xie, S.R. Hunter, and M. D. Rossetti. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. In Press.

4. *Eun, H.K., Shashaani, S., and Barton, R.R., Identifying Input Uncertainty Induced Bias Using Wasserstein and Kingman Metrics. In *Proceedings of the 2024 Winter Simulation Conference*, edited by H. Lam, E. Azar, D. Batur, W. Xie, S.R. Hunter, and M. D. Rossetti. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. In Press.
5. *Houser, E. and Shashaani, S., Rapid Screening and Nested Partitioning for Feature Selection. In *Proceedings of the 2024 Winter Simulation Conference*, edited by H. Lam, E. Azar, D. Batur, W. Xie, S.R. Hunter, and M. D. Rossetti. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. In Press.
6. *Jain, P., Shashaani, S. Dynamic Stratification and Post-Stratified Adaptive Sampling for Simulation Optimization. In *Proceedings of the 2023 Winter Simulation Conference Simulation Optimization Track*, edited by C.G. Corlu, S.R. Hunter, H. Lam, B.S. Onggo, J. Shortle, and B. Biller. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. https://doi.org/10.1109/WSC60868.2023.10408173
7. *Vahdat, K., Shashaani, S., Adaptive Ranking and Selection Based Genetic Algorithms for Data-Driven Problems. In *Proceedings of the 2023 Winter Simulation Conference Simulation Optimization Track*, edited by C.G. Corlu, S.R. Hunter, H. Lam, B.S. Onggo, J. Shortle, and B. Biller. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. https://doi.org/10.1109/WSC60868.2023.10408610
8. *Ha, Y., Shashaani, S., Towards Greener Stochastic Derivative-Free Optimization with Trust Regions and Adaptive Sampling. In *Proceedings of the 2023 Winter Simulation Conference Simulation Optimization Track*, edited by C.G. Corlu, S.R. Hunter, H. Lam, B.S. Onggo, J. Shortle, and B. Biller. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. https://doi.org/10.1109/WSC60868.2023.10408143
9. Eckman, D.J., Henderson, S.G., Shashaani, S., Stochastic Constraints: How Feasible Is Feasible? In *Proceedings of the 2023 Winter Simulation Conference Simulation Optimization Track*, edited by C.G. Corlu, S.R. Hunter, H. Lam, B.S. Onggo, J. Shortle, and B. Biller. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. https://doi.org/10.1109/WSC60868.2023.10408734
10. Shashaani, S., and *Vahdat, K., Monte Carlo based Machine Learning. In *Proceedings of the 2022 International Conference on Operations Research*, edited by O. Grothe, S. Nickel, S. Rebennack, and O. Stein. Heidelberg: Springer. https://doi.org/10.1007/978-3-031-24907-5_75
11. *Jain, P., Shashaani, S., and Byon, E., Robust Simulation Optimization with Stratification, In *Proceedings of the 2022 Winter Simulation Conference*, edited by B. Feng, G. Pedrielli, Y. Peng, S. Shashaani, E. Song, C.G. Corlu, L.H. Lee, E.P. Chew, T.M.K. Roeder, and P. Lendermann. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. https://doi.org/10.1109/WSC57314.2022.10015515
12. *Ha, Y., Shashaani, S., and Tran-Dinh, Q., Improved Complexity Of Trust-Region Optimization For Zeroth-Order Stochastic Oracles with Adaptive Sampling, In *Proceedings of the 2021 Winter Simulation Conference*, edited by S. Kim, B. Feng, K. Smith, S. Masoud, Z. Zheng, C. Szabo, and M. Loper, Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. https://doi.org/10.1109/WSC52266.2021.9715529
13. *Vahdat, K., and Shashaani, S., Non-parametric Uncertainty Bias and Variance Estimation via Nested Bootstrapping and Influence Functions. In *Proceedings of the 2021 Winter Simulation Conference*, edited by S. Kim, B. Feng, K. Smith, S. Masoud, Z. Zheng, C. Szabo, and M. Loper, Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. https://doi.org/10.1109/WSC52266.2021.9715420
14. *Jain, P., Shashaani, S., and Byon, E., Wake Effect Calibration in Wind Power Systems with Adaptive Sampling based Optimization. In *Energy Systems Division of 2021 IISE Annual Conference and Expo Proceedings*, edited by A. Ghate, K. Krishnaiyer, and K. Paynabar. https://www.proquest.com/scholarly-journals/wake-effect-calibration-wind-power-syste docview/2560890092/se-2

15. *Mao, L., *Vahdat, K., Shashaani, S., Swann, J., Personalized Predictions for Unplanned Urinary Tract Infection Hospitalizations with Hierarchical Clustering. In *2020 INFORMS Conference on Service Science Proceedings*, edited by H. Yang,R. Qiu, and W. Chen. AI and Analytics for Public Health. Springer Proceedings in Business and Economics. Springer, Cham. https://doi.org/10.1007/978-3-030-75166-1_34
(Finalist – Student Paper Competition)
16. *Vahdat, K., Shashaani, S., Simulation Optimization Based Feature Selection, a Study on Data-driven Optimization with Input Uncertainty. In *Proceedings of the 2020 Winter Simulation Conference*, edited by K.G. Bae, B. Feng, B., S. Kim, S. Lazarova-Molnar, Z. Zheng, T.M.K. Roeder, and R. Thiesing, Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. https://doi.org/10.1109/WSC48552.2020.9383862
17. Manda, A., Gopalswamy, K., Shashaani, S., Uzsoy, R., A Simulation Optimization Approach for Managing Product Transitions in Multistage Production Lines. In *Proceedings of the 2020 Winter Simulation Conference*, edited by by K.-H.G. Bae, B. Feng, B., S. Kim, S. Lazarova-Molnar, Z. Zheng, T.M.K. Roeder, and R. Thiesing, Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. https://doi.org/10.1109/WSC48552.2020.9384036
18. *Vasquez, D., Shashaani, S., and Pasupathy, R. ASTRO for Derivative-Based Stochastic Optimization: Algorithm Description & Numerical Experiments. In *Proceedings of the 2019 Winter Simulation Conference*, edited by N. Mustafee, K.-H.G. Bae, S. Lazarova-Molnar, M. Rabe, C. Szabo, P. Haas, and Y.-J. Son, Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. https://doi.org/10.1109/WSC40007.2019.9004904
19. Shashaani, S., Hunter, S. R. and Pasupathy, R., 2016. ASTRO-DF: Adaptive Sampling Trust-Region Optimization Algorithms, Heuristics, and Numerical Experience. In *Proceedings of 2016 Winter Simulation Conference*, edited by T.M.K. Roeder, P.I. Frazier, R. Szechtman, E. Zhou, T. Huschka, and S.E. Chick, Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, Inc. https://doi.org/10.1109/WSC.2016.7822121
(Winner – Best Student Paper award)

PRESENTATIONS

Invited

1. Shashaani, S., Derivative-free Stochastic Trust Region Optimization using Randomized Subsapces, 2025 International Conference on Continuous Optimization, invited by Ana Luisa Custodio, Cluster chair of Derivative-free Optimization, Los Angeles, CA. Jul 2025.
2. Shashaani, S., Regularization and Variance Reduction for Stochastic Trust Regions using Adaptive Sampling, Portuguese American Optimization Workshop (PAOW) and Modeling and Optimization: Theory and Applications (MOPTA), invited by Luis Nunes Vicente, Organizing Committee Co-Chair. Azores, Portugal. June 2025.
3. Shashaani, S., Regularization and Variance Reduction for Stochastic Trust Regions using Adaptive Sampling, 2025 IISE Annual Conference and Expo, invited for the Modeling and Simulation Track's best paper competition. Atlanta, GA. June 2025.
4. Shashaani, S., Simulation Optimization: An Introductory Tutorial, 2024 Winter Simulation Conference, invited by Canan Corlu and Chang–Han Rhee Track Chairs of Introductory Tutorials, Orlando, FL. Dec 2024.
5. *Felice, N., Shashaani, S., Eckman, D.E., and Sanchez, S.S., Data Farming for Repeated Simulation Optimization Experiments, 2024 Winter Simulation Conference, invited by Ben Feng, track chair of Analysis Methodology, 2024 Winter Simulation Conference, Orlando, FL. Dec 2024.
6. *Jeon, Y., Shashaani, S., Calibrating Digital Twins via Bayesian Optimization with a Root Finding Strategy, invited by Ben Feng, track chair of Analysis Methodology, 2024 Winter Simulation Conference, Orlando, FL. Dec 2024.

7. *Hyung, H.K., Shashaani, S. and Barton, R., Identifying Input Uncertainty Induced Bias using Wasserstein and Kingman Metrics, invited by Siyang Gao, track chair of Simulation Optimiation, 2024 Winter Simulation Conference, Orlando, FL, Dec 2024.
8. *Jain, P., Shashaani, S., Efficiency Analysis of Simulation Optimization with Dynamic Stratification of Large Input Spaces, invited by Enlu Zhou, Cluster Chair of Simulation Track, INFORMS Annual Meeting, Seattle, WA. Oct 2024.
9. *Hyung, H.K., Shashaani, S., and Barton, R., Comparative Analysis of Distance Metrics in Distributionally Robust Optimization for Queuing Systems: Wasserstein vs. Kingman, invited by Enlu Zhou, Cluster Chair of Simulation Track, INFORMS Annual Meeting, Seattle, WA. Oct 2024.
10. Park, J., Ko, Y.M., Shashaani, S., E. Byon, Strata Design for Variance Reduction in Stochastic Simulation, invited by Ye Kwon Huh and Kaibo Liu, co-Chairs of Explainable AI for Prognostics Session, INFORMS Annual Meeting, Seattle, WA. Oct 2024.
11. *Jeon, Y., Shashaani, S., Calibrating Digital Twins via Bayesian Optimization with a Root Finding Strategy, invited by Enlu Zhou, Cluster Chair of Simulation Track, INFORMS Annual Meeting, Seattle, WA. Oct 2024.
12. Shashaani, S., High Efficiency in Stochastic Trust Regions, invited by Albert S. Berahas, Bollapragada Raghu, Shagun Gupta, and Jiahao Shi, co-Chairs of Large-scale Nonlinear and Stochastic Optimization Session, INFORMS Annual Meeting, Seattle, WA. Oct 2024.
13. Shashaani, S., Sürer, Ö., and Plumlee, M., Decision Trees with Scoring Rules, invited by Robert Gramacy, Technometrics Journal Editor, 66th Annual Fall Technical Conference of ASA, Nashville, TN, Oct 2024.
14. *Ha, Y., and Shashaani, S., First-order Trust-region Methods with Adaptive Sampling, invited by Julie Mueller, Track Chair of Computational Optimization, INFORMS Optimization Society Conference, Houston, TX, Mar 2024.
15. Shashaani, S., Ha, Y., and Pasupathy, R., Is building first-order simulation oracles really worth it?, 25th International Symposium on Mathematical Programming (ISMP2024), invited by invited by Stefan Wild, Ana Custodio, and Francesco Rinaldi, Cluster Chairs of Derivative–free and Simulation–based Optimization Stream of the Continuous Optimization, Montréal, Canada. Jul 2024.
16. *Jain, P., Shashaani, S., Dynamic Stratification and Adaptive Sampling for Simulation Optimization, invited by David Eckman and Siyang Gao, Track Chairs of Simulation Optimization, 2023 Winter Simulation Conference, San Antonio, TX, Dec 2023.
17. Eckman, D., Shashaani, S., and Henderson, S., Stochastic Constraints: How Feasible is Feasible?, invited by David Eckman and Siyang Gao, Track Chairs of Simulation Optimization, 2023 Winter Simulation Conference, San Antonio, TX, Dec 2023.
18. *Jain, P., Shashaani, S., Concomitant Variables for Dynamic Stratification for Simulation Optimization, invited by Enlu Zhou, Cluster Chair of INFORMS Simulation Society, 2023 INFORMS Annual Meeting, Phoenix, AZ, Oct 2023.
19. *Ha, Y., and Shashaani, S., Greener Trust-Region Optimization for Zeroth-Order Stochastic Oracles, invited by invited by Juliane Mueller, Track Chair of Computational Optimization & Software Stream of INFORMS Optimization Society, 2023 INFORMS Annual Meeting, Phoenix, AZ, Oct 2023.
20. *Ha, Y., and Shashaani, S., Complexity Analysis of Adaptive Sampling based Trust-region methods, invited by Tommaso Giovannelli, Conference co-Chair, Modeling and Optimization: Theory and Applications (MOPTA) Conference, Bethlehem, PA, Aug 2023.
21. *Jain, P., Shashaani, S., Byon, E., Robust Calibration Of Wake Effect in Wind Farms with Stratified Adaptive Sampling, invited by Eunshin Byon, Conference co-Chair, INFORMS Conference on Quality, Statistics, and Reliability (ICQSR), Raleigh, NC. Jun 2023.
22. Shashaani, S., and Jain, P., Robust Simulation Optimization with Stratified Sampling, invited by invited by Enlu Zhou and Zhaolin Hu, Track Chairs of Model Uncertainty and Robust Simulation, 2022 Winter Simulation Conference, Singapore, Dec 2022.

23. *Ha, Y., and Shashaani, S., Trust-Region Optimization for Zeroth-Order Stochastic Oracles, invited by Juliane Mueller, Track Chair of Computational Optimization & Software Stream of the INFORMS Optimization Society, 2022 INFORMS Annual Meeting, Indianapolis, IN, Oct 2022.
24. *Vahdat, K., and Shashaani, S., Robust Monte Carlo-based Prediction Modeling, invited by Jie Xu, Cluster Chair of INFORMS Simulation Society, 2022 INFORMS Annual Meeting, Indianapolis, IN. Oct 2022.
25. Shashaani, S., Monte Carlo Based Machine Learning, invited by invited by Steffen Rebennack, Cluster Chair of Simulation Track, International Conference of Operations Research, Karlsruhe, Germany, Sep 2022.
26. Shashaani, S., and Ha, Y., Stochastic Trust-Region Optimization with Diagonal Hessians for Zeroth-Order Stochastic Oracles, invited by Jeff Larson and Stefan Wild, Cluster Chairs of Derivative–Free–Optimization, International Conference of Continuous Optimization, Bethlehem, PA. Aug 2022.
27. *Ha, Y., and Shashaani, S., Complexity Analysis of Trust-Region Optimization with Adaptive Sampling for Zeroth-Order Stochastic Oracles, invited by Raghu Bollapragada, Track Chair of Nonlinear Optimization, 2022 INFORMS Optimization Society Conference, Greenville, SC. Mar 2022.
28. *Vahdat, K., and Shashaani, S., Non-parametric Uncertainty Bias and Variance Estimation via Nested Bootstrapping and Influence Functions, invited by Canan Corlu and Enlu Zhou, Track Chairs of Model Uncertainty and Robust Simulation, 2021 Winter Simulation Conference, Phoenix, AZ. Dec 2021.
29. Shashaani, S., Eckman, D., Henderson, S., Evaluating Simulation Optimization Algorithms and SimOpt Library, invited Vahid Sarhangian, Session Chair of Advances in Stochastic Simulation, Canadian Operations Research Society (CORS) Annual Meeting, Virtual. Jun 2021.
30. *Manda, A., Gopalswamy, K., Shashaani, S., Uzsoy, R., A Simulation Optimization Approach for Managing Product Rampup in Production Lines, invited by Track Chairs of Semiconductors Simulation, 2020 Winter Simulation Conference, Virtual. Dec 2020.
31. Shashaani, S., Data-driven Simulation Optimization and Adaptive Sampling, invited by David Eckman, Track Chair of Stochastic Simulation, 2020 INFORMS Annual Meeting, Virtual. Nov 2020.
32. *Vasquez, D., Shashaani, S., and Pasupathy, R. ASTRO: Adaptive Sampling Trust-Region Optimization, A Class of Derivative-based Simulation Optimization Algorithms – Numerical Experiments, invited by Simulation Optimization Track Chairs, 2019 Winter Simulation Conference, National Harbor, MD. Dec 2019.
33. Shashaani, S., Complexity of ASTRO-DF: Adaptive Sampling Trust-region Methods for Derivative-free Simulation Optimization, invited by invited by David Eckman, Session Chair of Simulation Optimization, 2019 INFORMS Annual Meeting, Seattle, WA. Nov 2019.
34. Shashaani, S., and Guikema, S.D., Hurricane Induced Power Outage Predictions: Current Practice, New Approaches, invited by Mark Daskin, Department Chair, University of Michigan IOE 60+ Anniversary, Ann Arbor, MI. Nov 2017.
35. Shashaani, S., Türkcan, A., Lawley, M., Wan, H., Uncertainty in Chemotherapy Patient Scheduling, invited by Ayten Türkcan, Session Chair of Healthcare Optimization, INFORMS Annual Meeting, Phoenix, AZ. Oct 2012.

Contributed

36. Shashaani, S., Regularization and Variance Reduction for Stochastic Trust Regions using Adaptive Sampling, INFORMS Computing Society Conference, Toronto, Canada. Mar 2025.
37. Abdelaal, Y., Sharara, M., Youssef, M., Larson, S., and Shashaani, S., Developing an Estimation Model for Nitrogen Concentration in Swine Lagoons, 2025 NC Water Resources Research Institute Annual Meeting, Raleigh, NC. Mar 2025.

38. *Houser, E., Shashaani, S., Rapid Screening and Nested Partitioning for Feature Selection, 2024 Winter Simulation Conference, Orlando, FL. Dec 2024.
39. Shashaani, S., First-order Trust-region Methods with Adaptive Sampling, 33rd European Conference on Operational Research (EURO 2024), Copenhagen, Denmark. Jul 2024.
40. Byon, E., Shashaani, S., and Jain, P., Dynamic Stratification for Efficient Calibration of Computer Models, INFORMS Conference on Quality, Statistics, and Reliability (ICQSR), Como Lake, Italy. Jul 2024.
41. *Ha, Y., and Shashaani, S., Greener Trust-Region Optimization for Zeroth-Order Stochastic Oracles, 2023 Winter Simulation Conference, San Antonio, TX. Dec 2023.
42. *Vahdat, K., and Shashaani, S., Adaptive Ranking and Selection Based Genetic Algorithms for Data-driven Problems. 2023 Winter Simulation Conference, San Antonio, TX. Dec 2023.
43. Park, J., Shashaani, S., and Byon, E., Stratified Sampling for Reliability Analysis Using Stochastic Simulation with Multi-dimensional Input, INFORMS Conference on Quality, Statistics, and Reliability (ICQSR), Raleigh, NC. Jun 2023.
44. *Jain, P., Shashaani, S., Byon, E., Efficient Calibration of Wake Effect with Data-driven Optimization, 2023 INFORMS Annual Meeting, Phoenix, AZ. Oct 2023.
45. Shashaani, S., Robust and Efficient Learning in High-dimensions, 2023 ASA/IMS Spring Research Conference on Statistics in Industry and Technology, Banff, Canada. May 2023.
46. *Jain, P., Shashaani, S., Byon, E., Efficient Dynamic Stratification for Simulation Optimization, 2022 INFORMS Annual Meeting, Indianapolis, IN. Oct 2022.
47. *Ha, Y., Shashaani, S., and Tran–Dinh, Q., Adaptive Sampling Trust-region Optimization with Diagonal Hessian for Derivative-free Stochastic Oracles, 2022 INFORMS Optimization Society Conference, Greenville, SC. Mar 2022.
48. *Ha, Y., Shashaani, S., and Tran-Dinh, Q., Improved Complexity of Trust-region Optimization for Zeroth-order Stochastic Oracles with Adaptive, 2021 Winter Simulation Conference, Phoenix, AZ. Dec 2021.
49. *Ha, Y., Shashaani, S., and Tran-Dinh, Q., Improved Complexity of Trust-region Optimization for Zeroth-order Stochastic Oracles with Adaptive, 2021 INFORMS Annual Meeting, Anaheim, CA. Oct 2021.
50. *Jain, P., Shashaani, S., and Byon, E., Wake Effect Calibration in Wind Power Systems with Stratified and Adaptive Sampling based Optimization, 2021 INFORMS Annual Meeting, Anaheim, CA. Oct 2021.
51. *Vahdat, K., Shashaani, S., Non-parametric Bias and Variance Estimation via Nested Bootstrapping and Influence Functions, INFORMS Annual Meeting, Anaheim, CA. Oct 2021.
52. *Vahdat, K., Shashaani, S., An Analysis of Estimators in Simulation Optimization-Based Feature Selection, 2021 Women in Statistics and Data Science Conference, Virtual. Oct 2021.
53. *Jain, P., Shashaani, S., and Byon, E., Wake Effect Calibration in Wind Power Systems with Adaptive Sampling based Optimization, 2021 IISE Annual Conference and Expo, New Orleans, LA. Jan 2021.
54. Shashaani, S., Vahdat, K., Simulation Optimization-based Feature Selection: A Study on Data-driven Optimization with Input Uncertainty, 2020 Winter Simulation Conference, Virtual. Dec 2020.
55. *Vahdat, K., Shashaani, S., A Study on Optimization Algorithms for Feature Selection with Simulation Optimization, 2020 INFORMS Annual Meeting, Virtual. Nov 2020.
56. *Vahdat, K., Shashaani, S., Improved Feature Selection with Simulation Optimization, 2019 INFORMS Annual Meeting, Seattle, WA. Nov 2019.
57. Shashaani, S., Feature Selection with Simulation Optimization, 2019 IISE Annual Conference and Expo, Orlando, FL. May 2019.
58. Shashaani, S., and Guikema, S.D., Hurricane Power Outage Prediction with Zero–Inflated Data, 2018 INFORMS Annual Meeting, Phoenix, AZ. Nov 2018.

59. Shashaani, S., and Guikema, S.D., Hurricane Power Outage Prediction with Out of Bag Feature Selection Approaches, Society of Risk Analysis (SRA) Annual Meeting, Arlington, VA. Dec 2017.
60. *Pino, J. V., Quiring, S. M., Guikema, G., Shashaani, S., Linger, S. and S. Backhaus. A High–Resolution Tropical Cyclone Power Outage Forecasting Model for the Continental US, Annual Meeting – American Geophysical Union, New Orleans, LA. Dec 2017.
61. Shashaani, S., and Guikema, S.D., Improved 3–Stage Prediction Models for Power Outage under Hurricanes and Severe Events, Data Science Research Forum, Michigan Institute for Data Science, Ann Arbor, MI. Dec 2017.
62. Shashaani, S., and Guikema, S.D., Hurricane Power Outage Prediction with Out of Bag Feature Selection Approaches, 2017 INFORMS Annual Meeting, Houston, TX. Oct 2017.
63. Shashaani, S., and Guikema, S.D., Improved 3–Stage Prediction Models for Power Outage under Hurricanes and Severe Events, Michigan Regional Postdoctoral Symposium, Detroit, MI. Sep 2017.
64. Shashaani, S., Plumlee, M., and Guikema, S.D., Probabilistic Classification and Regression Trees with Proper Scoring Rules, Applied Probability Society Conference, Evanston, IL. Jul 2017.
65. Shashaani, S., Hunter, S. R., and Pasupathy, R., ASTRO–DF Algorithms, Heuristics, and Numerical Experience, 2016 Winter Simulation Conference, Arlington, VA. Dec 2016. **(First Place - PhD Colloquium)**
66. Shashaani, S., Pasupathy, R., Adaptive Sampling Trust–region Methods for Derivative–based and Derivative–free Simulation Optimization Problems, 2016 INFORMS Annual Meeting, Nashville, TN. Nov 2016.
67. Shashaani, S., Pasupathy, R., ASTRO–DF: Adaptive Stochastic Trust Region Optimization, Derivative–Free. 2015 INFORMS Annual Meeting, Philadelphia, PA. Nov 2015.
68. Shashaani, S., Pasupathy, R., ASTRO–DF: Adaptive Stochastic Trust Region Optimization, Derivative–Free, International Symposium of Applied Mathematics, Pittsburg, PA. Jul 2015.
69. Pasupathy, R., Shashaani, S., ASTRO–DF: Adaptive Stochastic Trust Region Optimization: Derivative–Free, INFORMS Applied Probability Society Conference, Istanbul, Turkey. Jul 2015.
70. Shashaani, S., Pasupathy, R., ASTRO–DF: Adaptive Stochastic Trust Region Optimization: Derivative–Free, INFORMS Computing Society Conference, Richmond, VA. Jan 2015.
71. Shashaani, S., Chen, J., Nsoesie, E., Marathe, M., Comparison Study of Simulation Optimization for Real–Time Epidemic Forecasting, INFORMS Conference on Healthcare, Chicago, IL. Jun 2013.
72. Shashaani, S., and Marathe, M., Infectious Disease Prediction using Simulation Optimization, Models of Infectious Disease Agent Study (MIDAS) Meeting, Arlington, VA. Nov 2012.

Posters

73. *Eun, H. K., Shashaani, S., Barton, R., Computationally Efficient Distributionally Robust Optimization with Kingman Distance for Queuing Models, 18th Annual NC State University Graduate Student Research Symposium, Raleigh, NC. Apr 2025.
74. *Felice, N., Shashaani, S., Sanchez, S., Eckman, D., Repeatedly Solving Similar Simulation-Optimization Problems: Insights from Data Farming, ASME 2024 International Mechanical Engineering Congress and Exposition (IMECE2024), Portland, OR. Nov 2024.
75. *Jeon, Y., Shashaani, S., Calibrating Digital Twins using Bayesian Optimization with a Root-Finding Strategy, Applied AI in Engineering & Computer Science Symposium at NC State University, Raleigh, NC. Sep 2024.
76. *Houser, E., and Shashaani, S., Binary Simulation Optimization for Feature Selection, 17th Annual Graduate Student Research Symposium at NC State University, Raleigh, NC. Apr 2024.

77. *Ha, Y., and Shashaani, S., Accelerating Derivative-Free Simulation Optimization, 2023 Winter Simulation Conference PhD Colloquium, San Antonio, TX. Dec 2023.
78. *Vahdat, K., and Shashaani, S., Adaptive Ranking and Selection Based Genetic Algorithm for Data-driven Problems, 2023 Winter Simulation Conference PhD Colloquium, San Antonio, TX. Dec 2023.
79. *Jeon, Y., Shashaani, S., Introduction to Simulation Optimization and Data Analytics, 2023 ISE Engineering Open House, Raleigh, NC. Mar 2023.
80. *Amarnath, A., White, T., and Shashaani, S., Data Analysis Tool to Predict Defects in Additive Manufacturing, 2022 INFORMS Annual Meeting, Indianapolis, IN. Oct 2022.
81. *Ha, Y., Shashaani, S., Traffic Signal Control Simulation and Optimization, ISE Dedication Week, Raleigh, NC. Nov 2021.
82. *Vahdat, K., Shashaani, S., Simulation Optimization based Feature Selection, ISE Dedication Week, Raleigh, NC. Nov 2021.
83. *Jain, P., Shashaani, S., and Byon, E., Wake Effect Calibration in Wind Power Systems with Adaptive Sampling based Optimization, ISE Dedication Week, Raleigh, NC. Nov 2021.
84. *Vahdat, K., Shashaani, S., Simulation Optimization based Feature Selection, 2020 INFORMS Annual Meeting, Virtual. Oct 2020.
    (Runner-up - Poster Competition)
85. *Vahdat, K., Shashaani, S., An Analysis of Estimators in Simulation Optimization-Based Feature Selection, Women in Statistics and Data Science Conference, Virtual. Oct 2021.
86. *Jain, P., Shashaani, S., and Byon, E., Wake Effect Calibration in Wind Power Systems with Adaptive Sampling based Optimization, 2021 IISE Annual Conference and Expo, Virtual. Jan 2021.
87. *Ha. Y., Shashaani, S., Traffic Signal Control Simulation and Optimization, Contributed Poster, 2020 Winter Simulation Conference, Virtual. Dec 2020.
88. *Vahdat, K., Shashaani, S., Simulation Optimization based Feature Selection, 2019 Winter Simulation Conference, National Harbor, MA. Dec 2019.
89. *Vahdat, K., Shashaani, S., Feature Selection With Simulation Optimization, 2019 INFORMS Annual Meeting, Seattle, WA. Oct 2019.
90. *Vahdat, K. Shashaani, S., Improved Feature Selection with Simulation Optimization, FOPAM Conference on Foundations of Process Analytics and Machine learning, Raleigh, NC. Aug 2019.
91. Shashaani, S. ASTRO–DF: Adaptive Stochastic Trust Region Optimization, Derivative–Free, School of Industrial Engineering Annual Symposium, West Lafayette, IN. Apr 2015.
    (Third Place - Poster and Presentation Competition)
92. Shashaani, S., and Marathe, M., Infectious Disease Prediction using Simulation Optimization, 2012 INFORMS Annual Meeting, Phoenix, AZ. Oct 2012.
    (First Place - Interactive Session Competition)
93. Arnolds, I., Nickel, S., Shashaani, S., and Wernz, C., Using Simulation in Hospital Layout Planning, 2012 Winter Simulation Conference, Berlin, Germany. Dec 2012.

SEMINARS

1. Derivative-free Stochastic Trust-region Methods, invited by Daniel McKenzie and Samy Wu Fung, Optimization and Deep Learning group of the Department of Applied Mathematics and Statistics, Colorado School of Mines, Virtual. Jan 2025.
2. Simulation Optimization: An Introductory Tutorial to Methodology, invited by Chung-han Rhee and Canan Corlu, 2024 Winter Simulation Conference, Orlando, FL. Dec 2024.
3. Zeroth and First-order Stochastic Optimization for Nonconvex Problems with Adaptive Sampling, invited by Christine Currie, Department of Mathematics, University of Southampton, Southampton, UK. Jul 2024.

4. Simulation Optimization in Continuous and Discrete Decision Spaces, invited by Stefan Nickel, Kolloquium des Instituts für Operations Research, Karlsruhe Institute of Technology, Karlsruhe, Germany. Jul 2024.
5. Interpolation-based Trust-regions for Stochastic Derivative-free Optimization, invited by Ana Luísa Custódio, Sébastien Le Digabel Giampaolo Liuzzi, Margherita Porcelli, and Francesco Rinaldi, 2nd Derivative-free Optimization Symposium (DFOS), Department of Mathematics, University of Padova, Padova, Italy. Jun 2024.
6. Tutorial: Hedging Simulation Optimization Against Input Uncertainty, invited by Canan Corlu, 2024 Annual Modeling and Simulation Conference (ANNSIM), Washington D.C. Apr 2024.
7. Zeroth and First-order Stochastic Optimization for Nonconvex Problems with Adaptive Sampling, invited by Quoc Tran-dinh, Department of Statistics & Operations Research, University of North Carolina Chapel Hill, Chapel Hill, NC. Apr 2024.
8. Greener Stochastic Derivative–Free Optimization, invited by Frank Curtis, Department of Industrial and Systems Engineering, Lehigh University, Bethlehem, PA. Sep 2023.
9. Adaptive Sampling for Robust Stochastic Trust-region Optimization of Derivative-free Models, invited by Eunhye Song, Department of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA. Aug 2023.
10. Monte Carlo based Machine Learning, invited by Ruiwei Jiang, INFORMS Junior Faculty Interest Group Seminar, Virtual. Sep 2022.
11. Long–term Resilience and Stochastic Optimization, invited by Brad Murray, Disciplines 101 of C–CoAST Research Coordination Network at Duke University, Virtual. Sep 2021.
12. A Study on Data-driven Optimization with Input Uncertainty, invited by Stefan Wild, Jeff Larson, and Matt Menickelly, Numerical Software, and Statistics Seminar at Laboratory for Applied Mathematics, Argonne National Laboratory, Virtual. Apr 2020.
13. Complexity of ASTRO–DF: Adaptive Sampling Trust–region Methods for Derivative–free Simulation Optimization, invited by Bahar Biller, SAS Advanced Analysis and Operations Research, Cary, NC. Aug 2019.
14. Shashaani, S., Adaptive Sampling Trust–Region Methods for Derivative–based and Derivative–free Simulation Optimization, Computational Interdisciplinary Graduate Program's Seminar, Purdue University, West Lafayette, IN. Sep 2016.

RESEARCH AND TRAINING GRANTS

Current

1. *National Science Foundation* OAC 2410949: "Collaborative Research: Elements: A Computational and Data-Capable Environment for Stochastic Simulation Optimization", $599,997 (NCSU share $88,864), co-PI (with D. Eckman, Texas A&M U. and S. Henderson, Cornell U.) 06/24 – 06/27
2. *Department of Energy* Digitizing Utilities Round 2 Phase 1: "Storm-based Outage Prediction to Aid Crew Dispatching Decisions", $75,000, co-PI (with B. Rachunok and J. Kern, NCSU, North Carolina's Electric Cooperatives) 05/24 – 12/24
3. *Office of Naval Research* Mathematical Optimization Program N000142412398: "Fast and Scalable Stochastic Derivative-free Optimization", $495,772, Sole-PI 05/24 – 05/27
4. *North Carolina Department of Justice*: "A Modeling Tool to Advance Sustainability and Resiliency of Lagoon-sprayfield Systems in Eastern NC", $188,740, co-PI (with M. Sharara, M. Youssef, and S. Larson, NCSU) 01/24 – 12/25
5. *National Science Foundation* CMMI 2226347: "Collaborative Research: Calibrating Digital Twins in the Era of Big Data with Stochastic Optimization", $566,000 (NCSU share $282,315), Lead-PI (with E. Byon, U of Michigan) 01/23 – 12/25

6. *American Educational Research Association* Research Publication Grant in Engineering, Medicine and Science: "Adaptive Sampling Trust-region Methods for Nonconvex Stochastic Optimization", $34,977, Sole-PI 09/22 – 08/23
7. *North Carolina State University* Research and Innovation Seed Funding Program: "Impact of Future Climate Events on NC Animal Agriculture Systems", $33,750, PI (with M. Sharara and S. Larson, NCSU) 01/22 – 01/23
8. *North Carolina State University* Faculty Research & Professional Development: "Quantum Computing and Monte Carlo Methodology", $10,000, Sole-PI 07/21 – 07/22
9. *Center for Medicare & Medicaid Services* AI Health Challenge: "Multi-Layered Feature Selection and Dynamic Personalized Scoring for Prediction of Preventable Admissions & Adverse Events", In-kind $52,000, Lead-PI (with J. Swann, NCSU) 09/19 – 06/20

Pending

1. *Department of Energy* Digitizing Utilities Round 2 Phase 2: "Storm-based Outage Prediction to Aid Crew Dispatching Decisions", $200,000, co-PI
2. *National Science Foundation* CMMI-OE: CAREER: Gaining Robust Models and Decisions with Efficient Bias Correction, $510,000, Sole-PI
3. *Bezos Earth Fund*: WISE-GRID: Weather Integrated Smart Energy Grids, co-PI

TEACHING EXPERIENCE

Instructor, North Carolina State University

1. ISE 441: Introduction to Simulation Sp&Fa 2020, Fa 2021, Fa 2022, Sp 2023, Fa 2024
2. ISE/OR 562: Simulation Modeling Sp 2022, Sp 2024, Sp 2025
3. ISE/OR 762: Stochastic Simulation Fa 2022, Sp 2025
4. ISE/OR 772: Simulation Optimization Sp 2019, Sp 2021, Sp 2024

Instructor, University of Michigan

1. Predictive Modeling (Guest Lecturer - 3 sessions) Fa 2016
2. Economic Decision-Making Sp & Fa 2017

Teaching Assistant, Purdue University

1. Advanced Data Analytics Lab Sp 2016
2. Probability and Statistics in Engineering Fa 2014 – 2015

Teaching Assistant, Virginia Tech

1. Probabilistic Operations Research Sp 2014
2. Introduction to Probability and Statistical Quality Control Fa 2013
   (Alpha Pi Mu Outstanding Teaching Assistant of 2013 – 2014)
3. Discrete-event Simulation Lab Fa 2012

MENTORING AND ADVISING

Doctoral Students: Advisor

1. Nicole Felice (NCSU-OR) Tentative Graduation: Sp 2029
   Pre-candidate - Pre-Qualifying Exam
2. Ethan Houser (NCSU-ISE) Tentative Graduation: Sp 2028
   Pre-candidate - Post Qualifying Exam
3. Hyung Khee Eun (NCSU-ISE) Tentative Graduation: Sp 2027
   Pre-candidate - Post Qualifying Exam
4. Yongseok Jeon (NCSU-ISE; co-Advisor: Harrysson) Tentative Graduation: Sp 2026
   Pre-candidate - Post Qualifying Exam
5. Pranav Jain (NCSU-ISE) Graduation: Sp 2024
   Dissertation: Model Calibration via Optimization with Stratified Adaptive Sampling
   Placement: Postdoctoral Fellow at National Renewable Energy Laboratory
6. Yunsoo Ha (NCSU-ISE) Graduation: Fa 2023
   Dissertation: Accelerating Stochastic Derivative-free Optimization
   Placement: Postdoctoral Fellow at National Renewable Energy Laboratory
7. Kimia Vahdat (NCSU-ISE) Graduation: Fa 2023
   Dissertation: Machine Learning with Simulation Optimization
   Placement: Data Scientist at Liberty Mutual

Doctoral Students: Committee Member

8. Javier M. Roman (NCSU-MATH; Advisor: Combettes) Fa 2025
9. Sebastian R. Cartes (NCSU-ISE; Advisor: Mayorga) Su 2025
10. Diesta Maftuhah (NCSU-ISE; Advisor: Kern) Sp 2026
11. Diego Cornejo (NCSU-MATH; Advisor: Combettes) Sp 2025
12. Jingwei Qian (NCSU-ISE; Advisor: Kern) Sp 2025
13. Maria Davis (NCSU-MATH; Advisor: Papp) Sp 2023
14. Sanghyun Choo (NCSU-ISE; Advisor: Nam) Sp 2022
15. Breanna P. Swan (NCSU-ISE; Advisor: Mayorga & Ivy) Sp 2021
16. Kyle E. Paret (NCSU-ISE; Advisor: Mayorga) Su 2020
17. Atchyuta B. Manda (NCSU-ISE; Advisor: Uzsoy) Sp 2020

Doctoral Students: Research/Independent Study Supervisor

18. Amr Abu Orabi (NCSU-ISE) Fa 2024
19. Amirhossein Sadeghi (NCSU-ISE) Sp 2023
20. Daniel A.C. Vasquez (Purdue-Statistics) Fa 2022
21. Mina Mohammadi (NCSU-ISE) Fa 2020
22. Thomas Y.J. Chen (University of Michigan-IOE) Sp 2019

Master's Students: Research Supervisor/Mentor

1. Tabitha Gardner (NCSU-OR) Fa 2024
2. William Chrochocinski (NCSU-CSE) Fa 2024
3. Reetun Maiti (NCSU-ISE) Su 2024
4. Sarah Spall (NCSU-ISE) Fa 2022
5. R. Shashank V. Raman (NCSU-ISE) Sp 2022 – Fa 2022
6. Vasudev Sethuraman (NCSU-ISE) Sp 2022
7. Hisham Abu Nimeh (NCSU-ISE) Fa 2019
8. Ethan Houser (NCSU-ISE) Fa 2022 – Sp 2023

   Admitted to NCSU ISE PhD program for Fa 2023
9. Hyung Khee Eun (NCSU-ISE) Fa 2022

   Admitted to NCSU ISE PhD program for Sp 2023
10. Prasanth Yadla (NCSU-CSE) Sp 2020
11. Akash Pramodkumar Pateria (NCSU-CSE) Sp 2020

Master's Students: Committee Member

12. Ranbir Singh Multani (NCSU-IMSE) Sp 2024
13. Aishwarya Singhai (NCSU-IMSE) Sp 2024
14. Jay Khedekar (NCSU-IMSE) Sp 2023
15. Sagar Nagsandra Rangaswamaiah (NCSU-IMSE) Sp 2023

Bachelor's Students: Senior Design Mentor

1. Misk Hussain, Sharon Gilman, Hermann Ndeh (NIOSH) Fa 2024
2. Peyton Shue, Katie Evans, Griffin Cook, Will Parker (HerbaLife) Sp 2024
3. Zachary Warren (Javamasters) Fa 2023
4. Hazal Yigit, Amrita Malur, Bharat Yadav, Lydia Underwood (UNC Rex Hospital) Sp 2022

   (Winner of the Best Senior Design Poster)

Bachelor's Students: Research (REU)/Ind. Study Supervisor

5. Jenna Cuniowski (NCSU-ISE) Fa 2024
6. William Chrochocinski (NCSU-ISE) Sp 2024
7. Arvin Kushwaha (NCSU-Physics/Math) Sp 2023 – Fa 2023
8. Nicole Felice (NCSU-ISE) Su 2023 – Fa 2023

   Admitted to NCSU OR PhD program for Fa 2024
9. Kevin Xu (NCSU-Statistics) Fa 2022

   Admitted to U. of Washington Statistics Master's program for Fa 2024
10. Maria del Mar Davila Colon (Univ. of Puerto Rico) Su 2022
11. Sanskriti Deva (NCSU-Physics) Su 2022
12. Taylor White (NCSU-ISE) Sp 2022
13. Amrutha Amaranth (NCSU-ISE) Sp 2022 – Fa 2022
14. Rina Davila Severiano (NCSU-ISE) Sp 2022 – Su 2022

    Admitted to Georgia Tech ISyE PhD program for Fa 2023
15. Wes Hankinson (NCSU-ISE) Sp 2022

16. Nicole Colberg (NCSU-ISE) Fa 2021
17. Zack Horton (NCSU-ISE) Su 2021
18. Ethan Houser (NCSU-ISE) Sp 2021

    Admitted to NCSU ISE Master's program for Fa 2022
19. Lingchao Mao (NCSU-ISE) Fa 2020

    Admitted to Georgia Tech ISyE PhD program for Fa 2021
20. Santiago Volonte (NCSU-ISE) Su 2020
21. Dylan Hanser (NCSU-ISE) Sp 2020
22. Carolyn Drahuse (NCSU-ISE) Sp 2020
23. Kurtis Konrad (NCSU-ISE) Su 2020

    Admitted to NCSU ISE PhD program for Fa 2021

HONORS AND AWARDS

Scholarly Honors and Awards

- Finalist, 2025 MGB-SIAM Early Career Fellowship 2025
- Goodnight Early Career Innovators Award, NCSU 2024
- Winner Project "Uncertainty Quantification for Irrigation and Lagoon Management", NC Ag Analytics Platform Initiative, Sponsors: NCSU, NC A&T State U., and SAS 2024
- Phase 1 Winner, Digitizing Utilities, Department of Energy Office of Electricity 2024
- Featured Article "Predicting Additive Manufacturing Defects with Robust Feature Selection for Imbalanced Data", IISE Transactions Magazine 2024
- Bowman Faculty Scholar, NCSU ISE 2024
- Faculty Mobility Scholarship, Baden-Württemberg/North Carolina Exchange Program 2024
- International Alumnus of the Year, Southern Cross University 2023
- Coastal Resilience and Sustainability Initiative Writing Retreat Award, NCSU 2023
- Outstanding Contribution in Reviewing, Journal of Simulation 2022
- Distinguished Service as the Proceedings Editor, Winter Simulation Conference 2022
- Faculty Research and Professional Development Program Award, NCSU 2021
- Outstanding Reviewer Award, Winter Simulation Conference 2019
- Stage 1 Winner of AI Health Outcomes Challenge (top 25 in 300 teams), Center for Medicare and Medicaid Services (CMS) 2019
- First Place, Ph.D. Colloquium, INFORMS Simulation Society 2016
- Third Place, IE Symposium Poster Competition, Purdue University 2015
- Student Travel Award, College of Engineering, Purdue University 2015
- Ross Fellowship, School of Industrial Engineering, Purdue University 2014
- First Place, Interactive Presentation Competition, INFORMS Annual Meeting 2012
- KHYS Visiting Researcher Scholarship, Karlsruhe Institute of Technology 2012
- OIRED Summer Scholarship, Virginia Tech 2012
- First Place, Senior Design Project Competition, Industrial Engineering, IUST 2007
- Distinctive Student Award, Software Engineering, Aptech Worldwide IT Education 2006

Teaching Awards

- Excellence in Teaching Simulation Award, IISE Modeling & Simulation Division 2023
- Alpha Pi Mu Outstanding Teaching Assistant (voted by students), Virginia Tech 2014

Student Awards

- WSC Diversity Award, INFORMS Simulation Society (HK Eun) 2024
- Outstanding Reviewer Award, Winter Simulation Conference (Yunsoo Ha) 2024
- Distinguished Dissertation Award, NCSU ISE (Yunsoo Ha) 2024
- Travel Award, Annual Midwest Optimization Meeting, U. of Michigan (Yunsoo Ha) 2023
- Shook Mentor Award, NCSU ISE (Ethan Houser) 2023
- First Place, Simio Student Competition (Claudia Donahue and Alexej Lozevski) 2022
- Honorable Mention, Simio Student Competition (Daniel Malerich and Kelby Mace) 2022
- Mentored Teaching Fellowship, NCSU College of Engineering (Yunsoo Ha) 2022
- Outstanding Doctoral Scholar of the Year, NCSU ISE (Kimia Vahdat) 2022
- First Place, NCSU ISE Senior Design Poster Competition (Hazal Yigit, Amrita Malur, Bharat Yadav, Lydia Underwood) 2022
- Diversity Travel Award, Winter Simulation Conference (Kimia Vahdat) 2021
- Shook Mentor Award, NCSU ISE (Kimia Vahdat) 2021
- Finalist, Student Paper Competition, 2020 INFORMS Conference on Service Sciences (Lingchao Mao, Kimia Vahdat) 2020
- Finalist, Student Poster Competition, 2020 INFORMS Annual Meeting (Kimia Vahdat) 2020

PROFESSIONAL SERVICES

Professional Membership

- INFORMS Simulation Society (I-SIM) 2016 – present
  - + Elected I-SIM Board Member and Treasurer
  - + Former Chair and Member of I-SIM Diversity Committee
- INFORMS Computing Society 2020 – present
- INFORMS Junior Faculty Group 2020 – present
- INFORMS Applied Probability Society 2023 – present
- Society for Industrial and Applied Mathematics (SIAM) 2019 – present
- Institute of Industrial and Systems Engineers (IISE) 2019 – present
- American Statistical Association (ASA) 2019 – 2020
- Collaboratory for Coastal Adaptation over Space and Time (C-CoAST) Hub 2020 – 2022

Proposal Review Panelist

- NSF Ad Hoc Review, Computational and Data-Enabled Science and Engineering (CDS&E)
- NSF Civil, Operations Engineering in Division of Mechanical, and Manufacturing Innovation (CMMI-OE)
- NSF CDS&E in Mathematical and Statistical Sciences (CDS&E-MSS)
- NSF Cyberinfrastructure for Sustained Scientific Innovation (CSSI-OAC)

Editorial Service

- **Associate Editor (AE)**, Journal of Simulation 2024 – 2029
- **Chair/AE**, Analysis Methodology Track, Winter Simulation Conference Proceedings 2023
- **co-Editor**, Winter Simulation Conference Proceedings 2022

Journal Reviewer

- Operations Research (OPRE)
- Mathematical Programming (MP)
- SIAM Journal of Optimization (SIOPT)
- Journal of Optimization Theory and Applications (JOTA)
- Optimization Methods and Software (OMS)
- EURO Journal on Computational Optimization (EJCOMP)
- European Journal on Operations Research (EJOR)
- Journal of Simulation (JOS)
- Computers and Operations Research (CAOR)
- Vietnam Journal of Mathematics (VJOM)
- ACM Transactions of Modeling and Computer Simulation (TOMACS)
- IISE Transactions
- Entropy
- Systems Dynamics Review
- Risk Analysis
- International Journal of Electrical Power and Energy Systems

Proceedings Editorial Service

- co-Chair, Ph.D. Colloquium Track, Winter Simulation Conference 2025 – 2028
- co-Chair, Poster Track, Winter Simulation Conference 2024
- co-Chair, Analysis Methodology Track, Winter Simulation Conference 2021 – 2023
- Reviewer, Simulation Optimization Track, Winter Simulation Conference 2021 – 2023
- Reviewer, Model Uncertainty & Robust Sim. Track, Winter Sim. Conference 2021 – 2023
- Reviewer, Energy Systems Track (ENRE), IISE Annual Meeting 2021

Book Chapter Reviewer

- Larson, J., Menickelly, M., and Wild, S. 2019. Derivative–free optimization methods. *Acta Numerica*, 28, 287–404. doi: 10.1017/S0962492919000060

Event Organizer

- Workshop Organizer:
  + Tutorial on SimOpt Library (3 hours), Winter Simulation Conference 2022 – present
- Cluster Organizer:
  + Derivative-free Optimization Cluster, International Conference on Continuous Optimization (ICCOPT) 2022
- Session Organizer:
  + Simulation Track & Optimization Track, INFORMS Annual Meeting 2020 – 2024
  + Model Uncertainty & Robust Simulation Track, Winter Simulation Conference 2022
  + Simulation Track & Optimization Track, Canadian Operational Research Society 2021

University and Department Service

- **Committee Member**
  - + Awards Committee, NCSU ISE 2024 – 2025
  - + Master's Admission Committee, NCSU ISE 2024 – 2025
  - + Data Science Minor Committee, NCSU ISE 2023 – 2024
  - + Recruiting and Outreach Committee, NCSU ISE 2023 – 2024
  - + PhD Admissions, NCSU ISE 2022 – 2023
  - + Search Committee, NCSU ISE 2021 – 2023
- **Mentorship Services**
  - + Honors Program Panelist, NCSU Office of Undergraduate Research 2023 – 2024
  - + Senior Design Mentor (See Mentoring and Advising), NCSU 2020 – 2024
  - + Academic Packways Career Preparation Panelist, NCSU Graduate School 2020
- **Judge**
  - + 3MT (3-Minute Thesis) Competition, NCSU ISE 2022
  - + Senior Design, NCSU ISE 2019 & 2021
- **Active Member**
  - + Quantum Faculty Group, NCSU 2022 – present
  - + Coastal Resilience and Sustainability Initiative, NCSU 2020 – present
  - + Wellness in Academia Working Group, NCSU 2022
  - + Faculty Mediation and Grievance Cohort, NCSU 2021 – 2023
- **Simulation Archive Support:** Mentor and Member of Planning Committee, Physical National Archive of Simulation Methods and Software Located on NCSU Campus.
- **Outreach Service**
  - + Engineering Open House Simulation Tour, NCSU ISE 2023
  - + Summer Camp Simulation Workshop, NCSU 2022
  - + Dedication Week Simulation Posters, NCSU ISE 2021

CODE AND SOFTWARE

1. `SimOpt` **at** `simopt.org`**: Simulation Optimization Library**, developed in Python, open-source on GitHub with capabilities including
   - Growing testbed of real-world representative simulation models and optimization problems for continuous, integer, and mixed-integer decision spaces, and with deterministic and stochastic constraints, growing population of benchmark solvers to aid with solver development, object-oriented architecture for solver performance evaluation with controlled random number generation, finite-time performance of solvers plotting and comparison tools (11 newly designed plots) with uncertainty quantification using two-level bootstrapping, solver parameter tuning and low-fidelity metamodeling with large-scale experiments via data farming, and extensive documentation and graphical user interface for non-programmers, and instructional workshops and tutorial material to teach how to use the library.
2. `scoreTree` **at** `https://github.com/sshashaa/scoreTree`**: Building trees for probabilistic prediction**, with Ö. Sürer and M. Plumlee. Developed in Python, open source on GitHub.

3. `ARGA` **at** `https://github.com/sshashaa/arga`**: Adaptive Ranking and Selection Based Genetic Algorithm with Input Uncertainty and Robust Budget Allocation**, developed in Python, open-source on GitHub, with K. Vahdat.
4. `SOFS` **at** `https://github.com/sshashaa/fs-nested-partitioning`**: Simulation Optimization based Feature Selection**, E. Houser, and A. Sadeghi. Developed with R and Python including
    - Rapid screening and nested partitioning for a 0-1 simulation optimization to solve feature selection, bechmarking with `ARGA` and Bayesian Optimization in Python, synthetic Dataset generator for testing, bias correction with single, double, and conditional double, and condition double warp-speed bootstrapping.
5. `S-ASTRO-DF` **at** `https://github.com/sshashaa/s-astro-df`**: Stratified Adaptive Sampling with Trust Regions using Derivative-free Models**, with P. Jain, and K. Konrad, developed in Matlab, open source on GitHub including
    - Interpolation and regression routines for model construction, point selection routines for geometry improvement, strata construction using revised trees, interior point solvers, and mixed-integer programming for variance reduction, budget allocation integration with adaptive sampling, sampling procedures to work with high-dimensional datasets.
6. `ASTRO(DF)` **Adaptive Sampling Trust Region Optimization for Stochastic Nonconvex Problems** with two-stage estimation at `https://github.com/INFORMSJoC/2024.0575`, with Y. Ha, developed in Python, open source on GitHub, including
    - Built-in direct search routine, reuse of history with rotated coordinate-basis point selector, auxiliary variance model construction, corresponding sampling rules for derivative-based and derivative-free stochastic problems with and without use of common random numbers (CRN).
7. **Traffic Signal Control Stochastic Simulation Generator**, with Y. Ha, with Hankinson, and K. Xu, developed in MATLAB and Python, open source on GitHub, object-oriented scalable randomized network.