Arman Sabbaghi

Contact Information

Department of Statistics
150 North University Street
West Lafayette, IN 47907 USA

sabbaghi@purdue.edu
Google Scholar | LinkedIn

Summary Statement

Creative and principled statistical scientist with over a decade of experience at the intersection of AI and statistical innovation. Recognized for pioneering cutting-edge neural networks combined with causal, Bayesian, and experimental design methods that drive more powerful, precise, and efficient insights and decision-making in medicine and manufacturing.

Positions

Purdue University, Department of Statistics, West Lafayette, IN

Associate Member
Regenstrief Center for Healthcare Engineering — Jun. 2022 - Dec. 2022

Associate Professor — Aug. 2020 - Aug. 2021; Aug. 2022 - Dec. 2022; January 2025 - May 2025

Associate Director
Statistical Consulting Service — Jan. 2016 - Aug. 2021; Jun. 2022 - Dec. 2022

Assistant Professor — Aug. 2014 - Jul. 2020

- Conducted fundamental research on neural networks, Bayesian data analysis, causal inference, and experimental design to solve cutting-edge problems.
- Published 35 peer-reviewed articles, with over 900 citations and h-index of 16.
- Elected Member of the International Statistical Institute (ISI).
- PI/Co-PI on 15 projects, with total funding nearly $3 million, sponsored by the National Science Foundation, National Institutes of Health, Sandia National Labs, Showalter Trust, Eli Lilly & Company, Johnson & Johnson, and others.
- Supervised 9 PhD students whose employers include Intel, Purdue University, Johnson & Johnson, AstraZeneca, Vertex Pharmaceuticals, Yale University, the University of Washington at Tacoma, and Eli Lilly & Company.
- Served as Faculty Consultant for over 70 projects, and a Mentor for 8 - 10 Student Consultants, per year in the Statistical Consulting Service.

Unlearn.AI, San Francisco, CA

Head of Clinical Methods — Mar. 2023 - Sep. 2024
Head of Biostatistics Research — Jan. 2023 - Feb. 2023

- Pioneered the construction of 10 statistical methods that leverage digital twins.
- The methods can yield power gains of 5% in clinical trials.
- They can also reduce control arm sizes by up to 33% in Phase 3 trials.
- Directed the research and development work of 5 Statistical Research Fellows.
- Reported directly to the Vice President of Technology.
- Collaborated with cross-functional teams for the design, execution, and analysis of clinical trials.

University of California, Berkeley, Department of Statistics, Berkeley, CA

Visiting Scholar — Sep. 2021 - May 2022

Araqev LLC, West Lafayette, IN

President and CEO — Apr. 2020 - Dec. 2022

- Led the development of the software solution AMapi that applies patented AI algorithms to reduce reprints by 70% and triple throughput in AM systems.
- Managed projects with Rockwell Automation and other companies under NDAs.
- Established that AMapi saves $\$10,000$ per user of an AM system per week.

Education

Harvard University, Cambridge, MA
PhD, Statistics, May 2014
AM, Statistics, May 2011
- Thesis: *Dilemmas in Design: From Neyman and Fisher to 3D Printing*
- Advisors: Donald B. Rubin and Tirthankar Dasgupta
- National Science Foundation (NSF) Graduate Research Fellow

Purdue University, West Lafayette, IN
BS, Mathematics (with Honors), May 2009
BS, Mathematical Statistics, May 2009
- Graduated *With Highest Distinction*
- Phi Beta Kappa (2008)

Awards

Winner of the Best Application Paper
Awarded by the 2024 Institute of Industrial and Systems Engineering (IISE) Annual Conference & Expo
Recognizes the Best Applications Paper in the 2023 IISE Transactions Focus Issues on Design and Manufacturing. The paper recognized by this award is "Reconstructing original design: Process planning for reverse engineering", and was written by Dr. Zhaohui Geng, Dr. Sabbaghi, and Dr. Bopaya Bidanda.

Winner of a Seed for Success Acorn Award
Awarded by Purdue University (2022)
Awarded to investigators in recognition of their accomplishment in obtaining an external sponsored award of $1 million or more.

Elected Member of the International Statistical Institute
Awarded by the International Statistical Institute (2020)
Awarded to those who are established in their careers and have made significant contributions to the statistical profession.

Winner of a Trask Innovation Fund Award
Awarded by the Trask Innovation Fund (2020)
A development program that supports faculty-led projects that advance the commercial value of Purdue University intellectual property. The Trask Innovation Fund makes awards twice a year to aid faculty and staff with their patented innovations that are being commercialized through Purdue University's Office of Technology Commercialization. The technology recognized by this award is "AMapi: An API for Additive Manufacturing Systems".

Winner of the AHFE 2019 Best Paper Award
Awarded by the 2019 International Conference on Applied Human Factors and Ergonomics (AHFE) and its Affiliated Conferences
Recognizes the top four groups of researchers who submitted papers for the 2019 International Conference on AHFE and its Affiliated Conferences. The paper recognized by this award is "Modeling In-Plane Deviations of Shapes to Come Based on Prior Deviation Features in Additive Manufacturing", and was written by Dr. Sabbaghi.

Outstanding Assistant Professor Teaching Award
Awarded by the Purdue University Department of Statistics (2019)
Recognizes the teaching accomplishments of a tenure-track assistant professor.

Finalist for the Data Mining Section Best Theoretical Paper Award
Awarded by the Data Mining Section of INFORMS (2018)

Recognizes the top four groups of researchers who submitted papers to the Data Mining Section Best Theoretical Paper Award Competition at the 2018 INFORMS Annual Meeting. The paper recognized by this award is "Predictive Comparisons for Screening and Interpreting Inputs in Machine Learning", and was written by Dr. Raquel De Souza Borges Ferreira and Dr. Sabbaghi.

Winner of the QSR Section Best Student Paper Award
Awarded by the Quality, Statistics, Reliability (QSR) Section of INFORMS (2018)
Recognizes the top group of researchers, consisting of a doctoral student, their advisor(s), and other collaborators, who submitted a paper to the QSR Section Best Student Paper Award Competition at the 2018 INFORMS Annual Meeting. The paper recognized by this award is "Predictive Comparisons for Screening and Interpreting Inputs in Machine Learning", and was written by Dr. Raquel De Souza Borges Ferreira and Dr. Sabbaghi.

Regina and Norman F. Carroll (Col. USAF) Scholarship & Research Award
Awarded by the Purdue University Department of Statistics (2017)
Recognizes faculty members whose research represent distinctive contributions to statistical science.

Diversity Award
Awarded by the Purdue University College of Science (2017)
Recognizes excellence in leadership that improves the environment for faculty, staff, and students and promotes diversity and inclusiveness in the College of Science.

Finalist for the QSR Section Best Paper Award
Awarded by the Quality, Statistics, Reliability (QSR) Section of INFORMS (2016)
Recognizes the top four groups of researchers who submitted papers to the QSR Section Best Paper Award Competition at the 2016 INFORMS Annual Meeting. The paper recognized by this award is "Model Transfer via Equivalent Effects of Lurking Variables", and was written by Dr. Sabbaghi and Dr. Qiang Huang.

Early Career Scholarship
Awarded at the 22nd Annual ASA/IMS Spring Research Conference (2015)
Awarded to early career researchers (within five years of degree) in recognition of their research potential.

Refereed Publications

[1] Ohnishi Y., Karmakar B., Sabbaghi A. (2024) Degree of interference: A general framework for causal inference under interference. *Journal of Machine Learning Research* (accepted conditional on minor revisions).

[2] Patel S.H., Campbell N.W.C., Emenim C.E., Farino D.O., Damen F.W., Rispoli J.V., Goergen C.J., Haus J.M., Sabbaghi A., Carroll C.C. (2024) Patellar tendon biomechanics and morphology and their relationship to serum clinical variables in persons with pre-diabetes and type 2 diabetes. *Journal of Orthopaedic Research* 42, 1653–1669. DOI: 10.1002/jor.25816

[3] Ohnishi Y., Sabbaghi A. (2024) A Bayesian analysis of two-stage randomized experiments in the presence of interference, treatment nonadherence, and missing outcomes. *Bayesian Analysis* 19:1, 205–234. DOI: 10.1214/22-BA1347

[4] Nieforth L.O., Rodriguez K., Zhuang R., Miller E.A., Sabbaghi A., Schwichtenberg A.J., Granger D.A., O'Haire M. E. (2024) The cortisol awakening response in a

three-month clinical trial of service dogs for veterans with posttraumatic stress disorder. *Scientific Reports* 14:1, 1664.

[5] Abdul Wahab A.H., Qu Y., Michelis H., Luo J., Zhuang R., McDaniel D., Xi D., Polverejan E., Gilbert S., Ruberg S., Sabbaghi A. (2024) CITIES: Clinical Trials With Intercurrent Events Simulator. *Biometrical Journal* 66:1, 2200103.

[6] Leighton S.C., Rodriguez K.E., Zhuang R., Jensen C.L., Miller E.A., Sabbaghi A., O'Haire M.E. (2023) Psychiatric service dog placements are associated with better daily psychosocial functioning for military veterans with PTSD. *Psychological Trauma: Theory, Research, Practice, and Policy* Jul 6:10.1037/tra0001543.

[7] Carroll C.C., Campbell N.W.C., Patel S.H., Ferrandi P., Couture S., Farino D.O., Stout J., Sabbaghi A. (2023) Impact of essential amino acid intake, resistance exercise, and aging on Achilles peritendinous amino acid concentrations and collagen synthesis. *Amino Acids* 55:6, 777–787. DOI: 10.1007/s00726-023-03268-3

[8] Geng Z., Sabbaghi A., Bidanda B. (2023) Automated variance modeling for three-dimensional point cloud data via Bayesian neural networks. *IISE Transactions* 55:9, 912–925. DOI: 10.1080/24725854.2022.2106389 (Featured Research Article in August 2023 *Industrial and Systems Engineer Magazine*).

[9] Geng Z., Sabbaghi A., Bidanda B. (2023) Reconstructing original design: Process planning for reverse engineering. *IISE Transactions* 55:5, 509–522. DOI: 10.1080/24725854.2022.2040761 (Best Application Paper in the 2023 *IISE Transactions Focus Issue on Design and Manufacturing*).

[10] Geng Z., Sabbaghi A., Bidanda B. (2022) A framework of tolerance specification for freeform point clouds and capability analysis for reverse engineering processes. *International Journal of Production Research (Special issue of "Editorial Board contributions celebrating the 60th Anniversary of IJPR")* 60:24, 7475–7491.

[11] Jensen C.L., Rodriguez K.E., MacLean E.L., Wahab A.H.A., Sabbaghi A., O'Haire M.E. (2022) Characterizing veteran and PTSD service dog teams: Exploring potential mechanisms of symptom change and canine predictors of efficacy. *PLoS One* 17(7): e0269186.

[12] Keaton T.J., Sabbaghi A. (2022) Dismemberment and design for controlling the risk of regret for the multi-armed bandit. *Journal of Statistical Theory and Practice (AISC-2021 Special Collection)* 16:55, 1–29.

[13] Nieforth L.O., Abdul Wahab A.H., Sabbaghi A., Wadsworth S.M., Foti D., O'Haire M.E. (2022) Quantifying the emotional experiences of partners of veterans with PTSD service dogs using ecological momentary assessment. *Complementary Therapies in Clinical Practice* 48: 101590.

[14] Zhang Y., Sabbaghi A. (2021) The designed bootstrap for causal inference in Big Observational Data. *Journal of Statistical Theory and Practice* (Special issue of "State of the Art in Research on Design and Analysis of Experiments"), 15(4): 1–26.

[15] Odimayomi T., Proctor C.R., Wang Q.E., Sabbaghi A., Peterson K.S., Yu D., Lee J., Shah A.D., Ley C., Noh Y., Smith C., Webster J., Milinkevich K., Lodewyk M., Jenks J., Smith J., Whelton A.J. (2021) Water safety attitudes, risk perception, experiences, and education for households impacted by the 2018 Camp Fire, California. *Natural Hazards* 108: 947–975.

[16] Sabbaghi A. (2021) An integrative framework for geometric and hidden projections in three-level fractional factorial designs. *Journal of Statistical Planning and Inference* 215: 257-267.

[17] Carroll C.C., Patel S.H., Simmons J., Gorden B.D., Olsen J.F., Chemelewski K., Saw S.K., Hale T.M., Howden R., Sabbaghi A. (2020) The impact of genistein supplementation on tendon functional properties and gene expression in estrogen deficient rats. *Journal of Medicinal Food* 23(12): 1266–1274.

[18] Francis J., Sabbaghi A., Shankar R., Ghasri-Khouzani M., Bian L. (2020) Efficient distortion prediction of additively manufactured parts using Bayesian model transfer between material systems. *ASME Journal of Manufacturing Science and Engineering* 142(5): 051001 (16 pages).

[19] Ferreira R., Sabbaghi A., Huang Q. (2020) Automated geometric shape deviation modeling for additive manufacturing systems via Bayesian neural networks. *IEEE Transactions on Automation Science and Engineering* 17(2): 584–598.

[20] Sabbaghi A. (2020) An algebra for the conditional main effect parameterization. *Statistica Sinica* 30(2): 903–924.

[21] Keaton T.J., Sabbaghi A. (2019) Visualizations for interrogations of multi-armed bandits. *Stat* 8(1): e247.

[22] Sabbaghi A. (2019) An evaluation of estimation capacity under the conditional main effect parameterization. *Journal of Statistical Theory and Practice* 13(4): 1–16 (Special issue of "Algorithms, Analyses and Advanced Methodologies in the Design of Experiments").

[23] Kegele C.S., Oliveira J., Magrani T., Ferreira A., Ferreira R., Sabbaghi A., Ferreira A., Brandão A., Raposo N., Polonini H.C. (2019) A randomized trial on the effects of CitrusiM® (*Citrus sinensis* (L.) Osbeck dried extract) on body composition. *Clinical Nutrition Experimental* 27: 29–36.

[24] Patel S.H., Yue F., Saw S.K., Foguth R., Cannon J.R., Shannahan J., Kuang S., Sabbaghi A., Caroll C.C. (2019) Advanced glycation end-products suppress mitochondrial function and proliferative capacity of Achilles tendon-derived fibroblasts. *Scientific Reports* 9(1): 1–17.

[25] Wang Y., Ferreira R., Wang R., Qiu G., Li G., Qin Y., Ye P.D., Sabbaghi A., Wu W. (2019) Data-driven and probabilistic learning of the process-structure-property relationship in solution-grown tellurene for optimized nanomanufacturing of high-performance nanoelectronics. *Nano Energy* 57: 480–491.

[26] Sabbaghi A., Huang Q. (2018) Model transfer across additive manufacturing processes via mean effect equivalence of lurking variables. *Annals of Applied Statistics* 12(4): 2409–2429 (Finalist of the 2016 INFORMS QSR Section Best Paper Award Competition).

[27] Sabbaghi A., Huang Q., Dasgupta T. (2018) Bayesian model building from small samples of disparate data for capturing in-plane deviation in additive manufacturing. *Technometrics* 60(4): 532–544 (2018 INFORMS Annual Meeting *Technometrics* Invited Session paper).

[28] Patel S.H., Sabbaghi A., Carroll C.C. (2018) Streptozotocin-induced diabetes alters transcription of multiple genes necessary for extracellular matrix remodeling in rat patellar tendon. *Connective Tissue Research* 59(5): 447–457.

[29] Huang Q., Zhang J., Sabbaghi A., Dasgupta T. (2015) Optimal offline compensation of shape shrinkage for 3D printing processes. *IIE Transactions on Quality and Reliability Engineering* 47(5): 431–441 (2014 INFORMS Annual Meeting *IIE Transactions* Invited Session paper, and Featured Research Article in April 2015 *Industrial Engineer Magazine*).

[30] Sabbaghi A., Dasgupta T., Huang Q., Zhang J. (2014) Inference for deformation and interference in 3D printing. *Annals of Applied Statistics* 8(3): 1395–1415.

[31] Sabbaghi A., Rubin D.B. (2014) Comments on the Neyman-Fisher controversy and its consequences. *Statistical Science* 29(2): 267–284.

[32] Sabbaghi A., Dasgupta T., Wu C.F.J. (2014) Indicator functions and the algebra of the linear-quadratic parameterization. *Biometrika* 101(2): 351–363 (Finalist of the 2013 INFORMS QSR Section Best Student Paper Award Competition).

[33] DeMeyer L., Greve L., Sabbaghi A., Wang J. (2010) The zero-divisor graph associated to a semigroup. *Communications in Algebra* 38(9): 3370–3391 (Winner of a MAA Undergraduate Student Poster Session Prize at the 2009 Joint Mathematics Meetings).

Refereed Conference Proceedings

[1] Sabbaghi A., Huang Q. (2016) Predictive model building across different process conditions and shapes in 3D printing. In: *Twelfth Annual IEEE International Conference on Automation Science and Engineering (CASE 2016)*, August 2016.

[2] Sabbaghi A., Huang Q., Dasgupta T. (2015) Bayesian additive modeling for quality control of 3D printed products. In: *Eleventh Annual IEEE International Conference on Automation Science and Engineering (CASE 2015)*, August 2015.

[3] Xu L., Huang Q., Sabbaghi A., Dasgupta T. (2013) Shape deviation modeling for dimensional quality control in additive manufacturing. In: *ASME 2013 International Mechanical Engineering Congress & Exposition*, November 2013.

Refereed Book Chapters

Sabbaghi A. (2019) Modeling in-plane deviations of shapes to come based on prior deviation features in additive manufacturing. In *Advances in Additive Manufacturing, Modeling Systems and 3D Prototyping: Proceedings of the AHFE 2019 International Conference on Additive Manufacturing, Modeling Systems and 3D Prototyping, July 24-28, 2019, Washington D.C., USA*, ed. M. Di Nicolantonio, E. Rossi, and T. Alexander. Springer International Publishing (Winner of the AHFE 2019 Best Paper Award).

Reviews of Manuscripts Published in Mathematical Reviews

[1] MR4357709. Wang C., Mee R.W. Saturated and supersaturated order-of-addition designs. J. Statist. Plann. Inference 219 (2022), 204–215.

[2] MR4257528. Hazlett C. Kernel balancing: a flexible non-parametric weighting procedure for estimating causal effects. (English summary) Statist. Sinica 30 (2020), No. 3, 1155–1189.

Submitted Manuscripts

[1] Zhang Y., Sabbaghi A. (2022) Distributed design for causal inferences on Big Observational Data. Submitted to *Observational Studies*.

Manuscripts in Preparation

[1] Ross J.L., Sabbaghi A., Zhang R., Bertolini D., the Alzheimer's Disease Cooperative Study, the Alzheimer's Disease Neuroimaging Initiative, the Critical Path for Alzheimer's Disease, the European Prevention of Alzheimer's Disease (EPAD) Consortium, the Pooled Resource Open-Access ALS Clinical Trials Consortium

(2024) Enhancing longitudinal clinical trial efficiency with digital twins and prognostic covariate-adjusted mixed models for repeated measures (PROCOVA-MMRM).

[2] Li Y., Sabbaghi A., Walsh J.R., Fisher C.K. (2024) Prognostic covariate adjustment for logistic regression in randomized controlled trials.

[3] Vanderbeek A.M., Sabbaghi A., Walsh J.R., Fisher C.K. (2024) Bayesian prognostic covariate adjustment with additive mixture priors.

[4] Vanderbeek A.M., Vidovszky A.A., Ross J.L., Sabbaghi A., Walsh J.R., Fisher C.K., the Critical Path for Alzheimer's Disease, the Alzheimer's Disease Neuroimaging Initiative, the European Prevention of Alzheimer's Disease (EPAD) Consortium, the Alzheimer's Disease Cooperative Study (2023) A weighted prognostic covariate adjustment method for efficient and powerful treatment effect inferences in randomized controlled trials.

[5] Ferreira R., Sabbaghi A. (2022) Predictive comparisons for screening and interpreting inputs in machine learning (Winner of the 2018 INFORMS QSR Best Student Paper Competition, and Finalist of the 2018 INFORMS Data Mining Best Theoretical Paper Competition).

[6] Ohnishi Y., Kar W., Sabbaghi A. (2022) Analyzing the effects of new interventions with sequential treatment assignments: A study of digital e-mail promotions.

[7] Abdul Wahab A.H., Jensen C., Nieforth L., O'Haire M.E., Sabbaghi A. (2022) BGLAM: A Bayesian general logistic autoregressive model for correlated binary outcomes.

[8] Abdul Wahab A.H., Jensen C., Nieforth L., O'Haire M.E., Sabbaghi A. (2022) GLAMRE: A general logistic autoregressive model with random effects for heterogeneous correlated binary outcomes.

[9] Zhu W., Sabbaghi A. (2022) A closed-loop machine learning and compensation framework for geometric accuracy control of 3D printed products.

[10] Zhu W., Sabbaghi A. (2022) Multiple imputation and the bootstrap for the analysis of big Data with missingness.

[11] Cardona D., Cole B., Cleveland W., Sabbaghi A. (2022) Lightweight chained universal synthesizers.

[12] Zhang Y., Sabbaghi A. (2022) Causal inferences from the Institutional Data Analytics Platform.

[13] Francis J., Sabbaghi A., Shankar R., Doude H., Bian L. (2022) Bayesian model transfer in laser-based additive manufacturing for efficient distortion prediction of multiple machine systems.

[14] Francis J., Sabbaghi A., Shankar R., Doude H., Bian L. (2022) Validation of transfer learning of process-distortion models through compensation of LBAM fabricated parts.

[15] Ferreira R., Sabbaghi A., Prates M.O. (2020) Generalized predictive comparisons for interpreting complex models.

Books in Preparation

Rao V., Sabbaghi A. *Bayesian Data Science.* Chapman & Hall/CRC Press.

Grants

PI for the 2022 North Carolina Chapter of the American College of Cardiology Grant ($20,000): *Leveraging Artificial Intelligence to Prevent Disparities in Percutaneous Coronary Interventional Outcomes in a Diverse, High-Risk North Carolina County.* 9/2022 - 9/2023.

Co-PI Statistician for NIH Grant No. R01HS028026-01A1: *Wearable Sensors for Modeling and Assessing Non-Technical Skills in Surgery.* 9/2022 - 8/2026. Lead PI: Denny Yu, Purdue University, West Lafayette, IN. Total Funding: $321,821.

PI for Janssen Research and Development Research Agreement ($10,000): *Bayesian Methodologies Under the Tripartite Estimands Framework.* 9/2021 - 9/2022.

Co-PI Statistician for NIH Grant No. 1R01HD106413-01: *Multi-Site, Longitudinal Trial Evaluating the Efficacy, Mechanisms, and Moderators of Service Dogs for Military Veterans with PTSD.* 9/2021 - 8/2026. Lead PI: Marguerite O'Haire, Purdue University, West Lafayette, IN. Total Funding: $674,582.

PI for Eli Lilly and Company Research Agreement ($45,000): *Tripartite Estimands for Adherence Causal Inference in Clinical Trials.* 5/2021 - 12/2021.

Co-PI for NSF Grant No. CMMI-1762698: *Scalable Nanomanufacturing of Large-area Two-dimensional Tellurene for High-performance Wearable Piezoelectric Devices.* 5/2020 - 9/2021. Lead PI: Wenzhuo Wu, Purdue University, West Lafayette, IN. Other Co-PI: Peide Ye, Purdue University, West Lafayette, IN. Total Funding: $546,906.

PI for Sandia National Laboratories LDRD Grant No. 1701331 ($200,000): *A Statistical Analysis and Improvements to the TCARSS Synthetic Dataset Generation Methods.* 10/2019 - 9/2021.

Co-PI Statistician for NIH Grant No. 1R21EB026177-01A1: *Real-Time Non-Intrusive Workload Monitoring-Integration of Human Factors in Surgery Training and Assessment.* 9/2019 - 6/2021. Lead PI: Denny Yu, Purdue University, West Lafayette, IN. Total Funding: $404,706.27.

Co-PI Biostatistician for Showalter Trust Grant: *Mechanisms Underlying Tendon Dysfunction Associated with Diabetes.* 7/2019 - 6/2020. Lead PI: Chad Carroll, Purdue University, West Lafayette, IN. Total Funding: $73,205.

Co-Investigator Statistician for International Manganese Institute Grant: *Can Toenail Mn Levels Predict Brain Mn Levels?* 9/2018 - 8/2019. Lead PI: Ulrike Dydak, Purdue University, West Lafayette, IN. Total Funding: $29,286.

PI for Purdue University ITaP Explanatory Modeling Project Grant ($193,593): *Propensity Score Methods for Improved Explanatory Analyses with Forecast.* 8/2018 - 7/2022.

PI for NSF Grant No. CMMI-1744123 ($50,000): *Collaborative Research: EAGER: Explore the Theoretical Framework of Engineering Knowledge Transfer in Cybermanufacturing Systems.* 8/2017 - 7/2018. Lead PI: Qiang Huang, University of Southern California, Los Angeles, CA ($49,998). Other PIs: Matthew Plumlee, Northwestern University, Evanston, IL ($29,890) and Hui Wang, Florida State University, Tallahassee, FL ($29,999).

Co-PI Statistician for NIH Grant No. 1R21HD091896-01: *Quantifying the Efficacy and Role of Service Dogs for Military Veterans With PTSD and Their Spouses.* 5/2017 - 4/2020. Lead PI: Marguerite O'Haire, Purdue University, West Lafayette, IN. Total Funding: $414,880.

PI for NSF Grant No. CMMI-1544841 ($299,952): *CPS: Synergy: Collaborative Research: Smart Calibration Through Deep Learning for High-Confidence and Interoperable Cyber-Physical Additive Manufacturing Systems.* 9/2015 - 8/2020. Lead PI: Qiang Huang, University of Southern California, Los Angeles, CA ($350,000).

Purdue University Research Foundation International Travel Grant ($1,400). 8/2015.

NSF Graduate Research Fellowship, NSF Grant No. DGE-1144152. 9/2011 - 5/2014.

Patents

System and Method for Automated Geometric Shape Deviation Modeling for Additive Manufacturing. Patent Number 11,150,633. Submitted May 2019, Published October 2021.

Doctoral Advisory Committee Chair

Daniel Cardona (Co-Chair) (2024)

Yueyun Zhang (Co-Chair) (2024), Statistician at Eli Lilly & Company

David Arthur (Co-Chair) (2024), currently Assistant Professor of Statistics in the Division of Sciences and Mathematics at the University of Washington, Tacoma

Yuki Ohnishi (Co-Chair) (2024), currently Postdoctoral Researcher at Yale University

Yumin Zhang (2022), currently Senior Biostatistician II at Vertex Pharmaceuticals

Wenbin Zhu (2022), currently Senior Statistician at AstraZeneca

Ahmad Hakeem Abdul Wahab (2021), currently Principal Statistician at Johnson & Johnson Innovative Medicine

Timothy Jedidiah Keaton (2019), currently Assistant Professor of Practice in the Department of Statistics at Purdue University

Raquel De Souza Borges Ferreira (2019), currently Data Scientist at Intel

Doctoral Advisory Committee Member

Jorge Loria (2024), currently a Postdoctoral Researcher in the Finnish Center for Artificial Intelligence in Aalto University, working with Professor Samuel Kaski on Bayesian neural networks

Yiran Jiang (2023), currently a Postdoctoral Associate at Yale University

Sehwan Kim (2023), currently a Postdoctoral Research Fellow at Harvard Medical School

Clare Jensen (2023, Purdue University Department of Comparative Pathobiology)

Lily Darbishire (2022, Purdue University Department of Nutrition Science), currently Senior Research Associate at Purdue University

Zhaohui Geng (2021, University of Pittsburgh Department of Industrial Engineering), currently Assistant Professor in the Department of Industrial and Systems Engineering at the University of Ohio

Jialei Chen (2021, Georgia Institute of Technology H. Milton Stewart School of Industrial and Systems Engineering), currently Senior Researcher at Microsoft

Will Eagan (2020), currently Principal Biostatistician at Vertex Pharmaceuticals

Jack Francis (2020, Mississippi State University Department of Industrial and Systems Engineering), currently AI Solutions Director at Davidson Technologies

Hui Sun (2019), currently Principal Statistical Consultant at Novartis

He Luan (2018, University of Southern California Epstein Department of Industrial and Systems Engineering), currently Software Engineer at Google

Whitney Huang (2017), currently Assistant Professor in the School of Mathematical and Statistical Sciences at Clemson University

Yaxin Fang

Hanbyul Lee

Jeanine Gnang

Chang Cheng

MS Committee Chair

Bingxin Fa (2021)

Shanyun Gao (2021)

Krishnan Raman (2021)

Bowei Zhang (2021)

David Arthur (2021)

Shiwei Liu (2019)

Dominique McDaniel (2019)

Daniel Cardona (2019)

Ahmad Hakeem Abdul Wahab (2018)

Raquel De Souza Borges Ferreira (2018)

Megan Parker (2016)

MS Committee Member

Maxwell Smith Woodbury (2022)

Ju-Hsien Chang (2021)

Karolis Ramanauskas (Co-Chair) (2021)

Sivanand Puliyadi Ravi (Co-Chair) (2021)

Duong Ngoc Tran (2020)

Joseph Lawrence Byerly (2020)

Simon Andrew Miskimen (2020)

Patrick Gallagher (Co-Chair) (2019)

Usama Kamran (Co-Chair) (2019)

Kirsen Sullivan (2018)

Timothy Jedidiah Keaton (2016

Hui Sun (2016)

Invited Talks and Short Courses

[1] Sabbaghi A. "A Bayesian Analysis of Two-Stage Randomized Experiments in the Presence of Interference, Treatment Nonadherence, and Missing Outcomes". In: *2025 Joint Statistical Meetings*. August 4, 2025.

[2] Sabbaghi A. "Statistical Methods for Unleashing AI-Generated Digital Twins to Deliver More Efficient Randomized Controlled Trials ". In: *DIA 2025 Global Annual Meeting*. June 18, 2025.

[3] Sabbaghi A. "A Bayesian Analysis of Two-Stage Randomized Experiments in the Presence of Interference, Treatment Nonadherence, and Missing Outcomes". In: *2025 ENAR Spring Meeting*. March 25, 2025.

[4] Sabbaghi A. "Bayesian Prognostic Covariate Adjustment with Additive Mixture Priors". In: *2024 Joint Statistical Meetings*. August 6, 2024.

[5] Sabbaghi A. "Statistical Methods for Utilizing Digital Twins to Deliver More Efficient Randomized Controlled Trials". In: *2024 ICSA Applied Statistics Symposium*. June 17, 2024.

[6] Sabbaghi A. "The Epiphanies of Sir R.A. Fisher and Jerzy Neyman for Causal Inference From Designed Experiments". In: *St. Mary's College of California School of Economics and Business Administration*. May 3, 2024.

[7] Sabbaghi A. "Prognostic Digital Twins: Current and Future Applications". In: *George Mason University's Department of Statistics Seminar*. February 10, 2023.

[8] Sabbaghi A. "Bayesian Data Analysis and Monte Carlo Methods". In: *St. Mary's College of California School of Economics and Business Administration*. November 17, 2022.

[9] Zhu W., Sabbaghi A. "A Closed-Loop Machine Learning and Compensation Framework for Geometric Accuracy Control of 3D Printed Products". In: *FABTECH 2022*. November 9, 2022.

[10] Zhu W., Sabbaghi A. "A Closed-Loop Machine Learning and Compensation Framework for Geometric Accuracy Control of 3D Printed Products". In: *ASME 2022 International Mechanical Engineering Congress and Exposition (IMECE 2022)*. November 2, 2022.

[11] Zhu W., Sabbaghi A. "Closed-loop Machine Learning And Compensation For Geometric Accuracy Control Of Additively Manufactured Products". In: *2022 INFORMS Annual Meeting*. October 16, 2022.

[12] Ohnishi Y., Sabbaghi A. "A Bayesian Analysis of Two-Stage Randomized Experiments in the Presence of Interference, Treatment Nonadherence, and Missing Outcomes". In: *2022 INFORMS Workshop on Quality, Statistics, and Reliability*. October 15, 2022.

[13] Zhu W., Sabbaghi A. "A Closed-Loop Machine Learning and Compensation Framework for Geometric Accuracy Control of 3D Printed Products". In: *2022 Fall Technical Conference*. October 13, 2022.

[14] Ohnishi Y., Sabbaghi A. "A Bayesian Analysis of Two-Stage Randomized Experiments in the Presence of Interference, Treatment Nonadherence, and Missing Outcomes". In: *2022 International Conference on Advances in Interdisciplinary Statistics and Combinatorics*. October 7, 2022.

[15] Ruberg S., Sabbaghi A. Short Course: "Estimating Treatment Effect in a Principal Stratum: Applications of Causal Inference to the Tripartite Estimand Approach (TEA) and Early Biomarker Response". In: *2022 ASA Biopharmaceutical Section Regulatory-Industry Statistics Workshop*. September 20, 2022.

[16] Sabbaghi A. "Developments in Design: From Neyman and Fisher to Google and Beyond". In: *St. Mary's College of California School of Economics and Business Administration*. September 3, 2022.

[17] Zhu W., Sabbaghi A. "A Closed-Loop Machine Learning and Compensation Framework for Accuracy Control in 3D Printing". In: *RAPID + TCT 2022 Conference*. May 17, 2022.

[18] Zhu W., Sabbaghi A. "A Closed-Loop Machine Learning and Compensation Framework for Geometric Accuracy Control of 3D Printed Products". In: *2022 Online POMS Annual Conference*. April 22, 2022.

[19] Zhu W., Sabbaghi A. "A Closed-Loop Machine Learning and Compensation Framework for Geometric Accuracy Control of 3D Printed Products". In: *Northwestern University Center for Optimization and Statistical Learning Seminar Series*. April 7, 2022.

[20] Zhu W., Sabbaghi A. "A Closed-Loop Machine Learning and Compensation Framework for Geometric Accuracy Control of 3D Printed Products". In: *Maynooth University Hamilton Institute Seminar Series*. March 23, 2022.

[21] Sabbaghi A. "Causal Inference for Closed-Loop Quality Control in 3D Printing Systems". In: *University of California, Berkeley Causal Inference Group*. March 16, 2022.

[22] Sabbaghi A. "Pouring New Wines From Old Bottles: Jeff Wu's Contributions to the Design and Analysis of Fractional Factorials". In: *2020 Monie A. Ferst Award Symposium*. November 11, 2021.

[23] Francis J., Bian L., Sabbaghi A. "Distortion Modeling and Compensation Across Materials and Processes in Laser-Based Additive Manufacturing Systems via Bayesian Neural Networks". In: *2021 I-Dream4D Consortium Seminar Series*. November 9, 2021.

[24] Zhang Y., Sabbaghi A. "Distributed Design for Causal Inferences on Big Observational Data". In: *CUNY Baruch College Zicklin School of Business Information Systems and Statistics Research Seminar Series*. October 28, 2021.

[25] Francis J., Bian L., Sabbaghi A. "Distortion Modeling and Compensation Across Materials and Processes in Laser-Based Additive Manufacturing Systems via Bayesian Neural Networks". In: *2021 INFORMS Workshop on Quality, Statistics, and Reliability*. October 23, 2021.

[26] Zhang Y., Sabbaghi A. "Distributed Design for Causal Inferences on Big Observational Data". In: *University of Illinois at Urbana-Champaign Statistics Seminar*. October 14, 2021.

[27] Keaton T., Sabbaghi A. "Bandits With Priors". In: *2021 Virtual International Conference on Advances in Interdisciplinary Statistics and Combinatorics*. October 9, 2021.

[28] Hung H.M.J., Kothny W., Qu Y., Ruberg S.J., Sabbaghi A., Sparks J., Walton W. "ICH E9(R1) Addendum in Practice: An Industry-Regulatory Estimand Role Play". In: *2021 Virtual ASA Biopharmaceutical Section Regulatory-Industry Statistics Workshop*. September 24, 2021.

[29] Sabbaghi A. "New Perspectives on Randomization Tests for Co-Primary and Secondary Endpoints in Phase III Clinical Trials". In: *2021 Virtual ASA Biopharmaceutical Section Regulatory-Industry Statistics Workshop*. September 23, 2021.

[30] Sabbaghi A. "The Epiphanies of Sir R.A. Fisher and Jerzy Neyman for Causal Inference". In: *Purdue University Fall 2021 Distinguished Theme Seminar Series*. August 27, 2021.

[31] Sabbaghi A., Francis J., Shankar R., Ghasri-Khouzani M., Bian L. "Distortion Modeling and Compensation Across Materials and Processes in Laser-Based Additive Manufacturing Systems via Bayesian Neural Networks". In: *37th Annual Quality and Productivity Research Conference*. July 27, 2021.

[32] Sabbaghi A. "AMapi: An Application Programming Interface For The Control Of Additive Manufacturing Systems". In: *Institute of Industrial & Systems Engineers (IISE) Virtual Annual Conference & Expo 2021*. May 24, 2021.

[33] Zhang Y., Sabbaghi A. "Collaborative Design for Improved Causal Machine Learning on Big Observational Data". In: *2021 International Indian Statistical Association (IISA) Conference*. May 20, 2021.

[34] Zhang Y., Sabbaghi A. "The Designed Bootstrap for Causal Inference in Big Observational Data". In: *University of North Carolina at Greensboro Statistics Seminar*. February 12, 2021.

[35] Sabbaghi A. "AMapi: An Application Programming Interface For The Control Of Additive Manufacturing Systems". In: *2020 INFORMS Virtual Annual Meeting*. November 12, 2020.

[36] Zhang Y., Sabbaghi A. "Collaborative Design for Improved Causal Machine Learning on Big Observational Data". In: *Purdue University Krannert School of Management Econometrics Seminar Series*. October 19, 2020.

[37] Ferreira R., Sabbaghi A. "Predictive Comparisons for Screening and Interpreting Inputs in Machine Learning". In: *University of Waterloo Department of Statistics and Actuarial Science*. October 8, 2020.

[38] Sabbaghi A., Francis J., Shankar R., Ghasri-Khouzani M., Bian L. "Distortion Model Transfer Between Materials in Laser Based Additive Manufacturing Systems". In: *Rutgers University Department of Industrial and Systems Engineering*. October 6, 2020.

[39] Sabbaghi A. "AMapi: An Application Programming Interface for the Control of Additive Manufacturing Systems". In: *Motivate the Market 2019 Forum*. November 7, 2019.

[40] Sabbaghi A. "Designed Experiments on Additive Manufacturing Systems for Inference on Interference in Shape Deviations". In: *2019 INFORMS Annual Meeting*. October 22, 2019.

[41] Sabbaghi A., Francis J., Shankar R., Ghasri-Khouzani M., Bian L. "Distortion Model Transfer Between Materials in Laser Based Additive Manufacturing Systems via Bayesian Neural Networks". In: *2019 INFORMS Annual Meeting*. October 22, 2019.

[42] Zhang Y., Sabbaghi A. "Collaborative Design for Improved Causal Machine Learning on Big Observational Data". In: *2019 Design and Analysis of Experiments (DAE 2019) Conference*. October 18, 2019.

[43] Ferreira R., Sabbaghi A. "Predictive Comparisons for Screening and Interpreting Inputs in Machine Learning". In: *2019 Fall Technical Conference*. September 27, 2019.

[44] Sabbaghi A. "Machine Learning for Automated Predictive Modeling of Shape Deviations and Distortions in Additive Manufacturing Systems". In: *2019 Purdue University Additive Manufacturing Workshop*. September 26, 2019.

[45] Sabbaghi A. "Modeling In-Plane Deviations of Shapes to Come Based on Prior Deviation Features in Additive Manufacturing". In: *2nd International Conference on Additive Manufacturing, Modeling Systems and 3D Prototyping at the 10th International Conference on Applied Human Factors and Ergonomics and the Affiliated Conferences*. July 27, 2019.

[46] Sabbaghi A. "Model Transfer Across Additive Manufacturing Processes via Mean Effect Equivalence". In: *Air Force Research Laboratory Seminar Series*. July 9, 2019.

[47] Sabbaghi A. "Modeling In-Plane Deviations of Shapes to Come Based on Prior Deviation Features in Additive Manufacturing". In: *Fifth International Conference on the Interface Between Statistics and Engineering (ICISE 2019)*. June 27, 2019.

[48] Sabbaghi A. "Geometric Shape Deviation Modeling Across Different Processes and Shapes in Additive Manufacturing Systems". In: *36th Annual Quality and Productivity Research Conference*. June 13, 2019.

[49] Sabbaghi A., Huang Q. "Predictive Modeling Across Different Processes and Shapes in Additive Manufacturing". In: *Institute of Industrial & Systems Engineers (IISE) Annual Conference & Expo 2019*. May 19, 2019.

[50] Sabbaghi A., Ferreira R., Huang Q., Amstutz K. "Automated Machine Learning for Shape Deviation Modeling in Additive Manufacturing Systems". In: *Third Annual Purdue Technology Showcase*. May 16, 2019.

[51] Sabbaghi A. "Geometric Shape Deviation Modeling for Cyber-Physical Additive Manufacturing Systems". In: *Purdue University Nanomanufacturing Symposium*. April 30, 2019.

[52] Sabbaghi A. "Potential Outcome Model Transfer via Mean Effect Equivalence of Lurking Variables". In: *University of Notre Dame Department of Applied and Computational Mathematics and Statistics Seminar*. March 19, 2019.

[53] Sabbaghi A. "Deviation Modeling in Additive Manufacturing Systems". In: *Institute of Industrial & Systems Engineers (IISE) Quality Control and Reliability Engineering (QCRE) Division Webinar*. November 27, 2018.

[54] Sabbaghi A., Huang Q., Dasgupta T. "Bayesian Model Building From Small Samples of Disparate Data for Capturing In-Plane Deviation in Additive Manufacturing". In: *2018 INFORMS Annual Meeting Technometrics Invited Session*. November 4, 2018.

[55] Sabbaghi A. "An Algebra for the Conditional Main Effects Parameterization". In: *2018 International Conference on Advances in Interdisciplinary Statistics and Combinatorics*. October 6, 2018.

[56] Sabbaghi A., Huang Q. "Geometric Shape Deviation Modeling Across Different Processes and Shapes in Additive Manufacturing Systems". In: *2018 Fall Technical Conference*. October 5, 2018.

[57] Sabbaghi A. "Developments in Design: From Neyman and Fisher to Google and Beyond". In: *St. Mary's College of California School of Economics and Business Administration*. September 15, 2018.

[58] Ferreira R., Sabbaghi A., Huang Q. "Automated Geometric Shape Deviation Modeling for Cyber-Physical Additive Manufacturing Systems via Bayesian Neural Networks". In: *University of Southern California Center for Cyber-Physical Systems and the Internet of Things (CCI) and Ming Hsieh Institute for Electrical Engineering Seminar*. March 21, 2018.

[59] Plumlee M., Sabbaghi A. "Input Correction Algorithms to Produce Better Quality Parts". In: *Second Foundation of Accuracy Control for Additive Manufacturing Workshop (FACAM 2018)*. February 8, 2018.

[60] Sabbaghi A., Huang Q. "Deviation Modeling Across Different Process Conditions and Shapes in Additive Manufacturing Systems". In: *Second Foundation of Accuracy Control for Additive Manufacturing Workshop (FACAM 2018)*. February 8, 2018.

[61] Sabbaghi A., Huang Q. "Model Transfer Across Additive Manufacturing Processes via Mean Effect Equivalence of Lurking Variables". In: *University of Louisville Department of Bioinformatics and Biostatistics Seminar Series*. February 2, 2018.

[62] Sabbaghi A., Huang Q. "Predictive Model Building Across Different Process Conditions and Shapes in 3D Printing". In: *2017 INFORMS Annual Meeting*. October 22, 2017.

[63] Sabbaghi A. "Predictive Model Building Across Different Process Conditions and Shapes in Additive Manufacturing". In: *Sandia National Laboratories Statistical Sciences Colloquium*. September 21, 2017.

[64] Sabbaghi A. "Predictive Model Building Across Different Process Conditions and Shapes in Additive Manufacturing". In: *Accelerating NSF Research in Additive Manufacturing toward Industrial Applications Workshop*. August 18, 2017.

[65] Sabbaghi A., Huang Q. "Deformation Model Transfer via Equivalent Effects of Lurking Variables in Additive Manufacturing". In: *2017 Joint Statistical Meetings*. August 2, 2017.

[66] Sabbaghi A., Huang Q. "Predictive Model Building Across Different Process Conditions and Shapes in 3D Printing". In: *24th Annual ASA/IMS Spring Research Conference on Statistics in Industry and Technology*. May 18, 2017.

[67] Sabbaghi A., Huang Q. "Deformation Model Transfer via Equivalent Effects of Lurking Variables in Additive Manufacturing". In: *Purdue University School of Industrial Engineering Seminar Series*. February 8, 2017.

[68] Sabbaghi A., Huang Q. "Deformation Model Transfer via Equivalent Effects of Lurking Variables in Additive Manufacturing". In: *2016 INFORMS Annual Meeting*. November 13, 2016.

[69] Sabbaghi A. "Model Transfer via Equivalent Effects of Lurking Variables". In: *2016 NIC-ASA and ICSA Midwest Joint Fall Meeting*. November 11, 2016.

[70] Huang Q., Sabbaghi A. "Smart Calibration Through Deep Learning for High-Confidence and Interoperable Cyber-Physical Additive Manufacturing Systems". In: *2016 National Science Foundation Cyber-Physical Systems Program Principal Investigators Meeting*. October 31, 2016.

[71] Sabbaghi A. "Hidden Connections Between Different Projections Under the Linear-Quadratic Parameterization". In: *2016 International Conference on Advances in Interdisciplinary Statistics and Combinatorics*. September 30, 2016.

[72] Sabbaghi A., Huang Q. "Predictive Model Building Across Different Process Conditions and Shapes in 3D Printing". In: *Twelfth Annual IEEE International Conference on Automation Science and Engineering*. August 23, 2016.

[73] Sabbaghi A. "Discussion of Powerful Experimental Designs for Non-Gaussian Responses Invited Session". In: *2016 Joint Statistical Meetings*. August 3, 2016.

[74] Sabbaghi A. "Partial Aliasing Relations in Mixed Two- and Three-Level Designs". In: *2016 ICSA Applied Statistics Symposium*. June 14, 2016.

[75] Sabbaghi A., Huang Q. "Causal Model Transfer via Equivalent Effects of Lurking Variables". In: *23rd Annual ASA/IMS Spring Research Conference on Statistics in Industry and Technology*. May 25, 2016.

[76] Sabbaghi A., Huang Q. "Causal Model Transfer via Equivalent Effects of Lurking Variables". In: *Theoretical Foundations for Accuracy Control in Additive Manufacturing Workshop (FACAM 2016)*, Epstein Institute at the Viterbi School of Engineering, University of Southern California. January 18, 2016.

[77] Sabbaghi A., Huang Q., Dasgupta T. "Model Building from Small Samples of Disparate Data in 3D Printing". In: *Theoretical Foundations for Accuracy Control in Additive Manufacturing Workshop (FACAM 2016)*, Epstein Institute at the Viterbi School of Engineering, University of Southern California. January 18, 2016.

[78] Sabbaghi A., Stein N.M., Lee J.J., Lindborg S.R., Zhu Y. "New Perspectives on Tests for Co-Primary and Secondary Endpoints". In: *Epstein Institute Seminar*, Daniel J. Epstein Department of Industrial and Systems Engineering, University of Southern California. November 17, 2015.

[79] Sabbaghi A. "Partial Aliasing Relations in Mixed Two- and Three-Level Designs". In: *2015 INFORMS Annual Meeting*. November 4, 2015.

[80] Sabbaghi A., Huang Q., Dasgupta T. "Bayesian Additive Modeling for Quality Control of 3D Printed Products". In: *2015 INFORMS Annual Meeting*. November 1, 2015.

[81] Sabbaghi A., Huang Q., Dasgupta T. "Bayesian Additive Modeling for Quality Control of 3D Printed Products". In: *Eleventh Annual IEEE International Conference on Automation Science and Engineering*. August 26, 2015.

[82] Sabbaghi A., Stein N.M., Lee J.J., Lindborg S.R., Zhu Y. "New Perspectives on Randomization Tests for Co-primary and Secondary Endpoints". In: *2015 Joint Statistical Meetings*. August 10, 2015.

[83] Sabbaghi A. "Hidden Connections Between Different Projections Under the Linear-Quadratic Parameterization". In: *60th International Statistical Institute World Statistics Congress*. July 27, 2015.

[84] Sabbaghi A. "Hidden Connections Between Different Projections Under the Linear-Quadratic Parameterization". In: *32nd Quality & Productivity Research Conference*. June 11, 2015.

[85] Sabbaghi A., Huang Q., Dasgupta T. "Bayesian Additive Modeling for Quality Control of 3D Printed Products". In: *32nd Quality & Productivity Research Conference*. June 10, 2015.

[86] Sabbaghi A., Dasgupta T., Huang Q., Zhang J. "Inference for Deformation and Interference in 3D Printing". In: *2nd Workshop on Predictive Modeling and Control of Additive Manufacturing*, Epstein Institute at the Viterbi School of Engineering, University of Southern California. November 13, 2014.

[87] Sabbaghi A. "Projection Properties of Three-Level Fractional Factorial Designs Under the Linear-Quadratic System". In: *2014 INFORMS Annual Meeting*. November 9, 2014.

[88] Sabbaghi A., Dasgupta T., Huang Q., Zhang J. "Interference in Deformation Compensation for 3D Printing". NASA Engineering and Safety Center Engineering Statistics Team. May 21, 2014.

[89] Sabbaghi A. "The Power of Potential Outcomes in Experimental Design: From the Neyman-Fisher Controversy to 3D Printing". Department of Statistics, Purdue University. February 26, 2014.

[90] Sabbaghi A., Dasgupta T., Huang Q., Zhang J. "Posterior Predictive Checks for Interference in a 3D Printing Experiment". In: *2014 American Statistical Association Conference on Statistical Practice*. February 22, 2014.

[91] Sabbaghi A. "Expeditions in Modern Experimental Design: Partial Aliasing and Interference". Department of Statistics, Stanford University. February 11, 2014.

[92] Sabbaghi A. "Expeditions in Modern Experimental Design: Partial Aliasing and Interference". Department of Statistics, University of California, Berkeley. February 5, 2014.

[93] Sabbaghi A. "The Power of Potential Outcomes in Experimental Design: From the Neyman-Fisher Controversy to 3D Printing". Booth School of Business, University of Chicago. January 30, 2014.

[94] Sabbaghi A. "The Power of Potential Outcomes in Experimental Design: From the Neyman-Fisher Controversy to 3D Printing". H. Milton Stewart School of Industrial and Systems Engineering, Georgia Institute of Technology. January 23, 2014.

[95] Sabbaghi A. "Inference for Deformation and Interference in 3D Printing". Stuart School of Business, Illinois Institute of Technology. October 22, 2013.

[96] Sabbaghi A., Dasgupta T., Wu C.F.J. "Indicator Functions and the Algebra of the Linear-Quadratic Parametrization". In: *2013 INFORMS Annual Meeting QSR Best Student Paper Competition Session*. October 7, 2013.

Contributed Talks

[1] Zhu W., Sabbaghi A. "Causal Inference for Closed-Loop Quality Control in 3D Printing". In: *38th ASA Quality and Productivity Research Conference (2022 QPRC)*. June 16, 2022.

[2] Sabbaghi A., Huang Q., Dasgupta T. "Bayesian Additive Modeling for Quality Control of 3D Printed Products". In: *22nd Annual ASA/IMS Spring Research Conference on Statistics in Industry and Technology*. May 21, 2015.

[3] Sabbaghi A., Dasgupta T., Huang Q., Zhang J. "Interference in Deformation Compensation for 3D Printing". In: *16th Meeting of New Researchers in Statistics and Probability*. August 1, 2014.

[4] Sabbaghi A., Dasgupta T., Huang Q., Zhang J. "Inference with Interference and Interference for Inference in a 3D Printing Experiment". In: *2013 INFORMS Annual Meeting*. October 9, 2013.

[5] Sabbaghi A., Dasgupta T., Huang Q., Zhang J. "Inference with Interference and Interference for Inference: Modeling Potential Outcomes and Interference in a 3D Printing Experiment". In: *2013 Joint Statistical Meetings*. August 5, 2013.

[6] Sabbaghi A., Dasgupta T., Wu C.F.J. "Interesting Insights in Indicators: Indicator Functions and the Algebra of the Linear-Quadratic Parametrization". In: *20th Annual ASA/IMS Spring Research Conference on Statistics in Industry and Technology*. June 22, 2013.

[7] Sabbaghi A., Dasgupta T., Zhang J., Huang Q. "Inference with Interference and Interference for Inference: Modeling Potential Outcomes and Interference in a 3D Printing Experiment". In: *30th Quality & Productivity Research Conference*. June 5, 2013.

Purdue Statistics Talks

[1] Sabbaghi A. "Sports and Statistics, or, a Bayesian is Better at Betting on Basketball". In: *2017 Cary Quadrangle Talks*. September 26, 2017.

[2] Sabbaghi A. "Challenges and Opportunities in Statistical Quality Control for 3D Printing". In: *Statistics Living-Learning Community Fall 2015 Seminar (STAT 290: Rising Above the Gathering Storm)*. October 27, 2015.

[3] Sabbaghi A. "Challenges and Opportunities in Statistical Quality Control for 3D Printing". In: *Exploring Statistical Sciences Research Seminar (STAT 598V)*. September 23, 2015.

[4] Sabbaghi A. "Causal Inference Under the Potential Outcomes Framework: History, Applications, Challenges". In: *Statistics Living-Learning Community Spring 2015 Seminar (STAT 290: What is the Big Idea?)*. March 10, 2015.

[5] Sabbaghi A. "Causal Inference Under the Potential Outcomes Framework: History, Applications, Challenges". In: *Exploring Statistical Sciences Research Seminar (STAT 598V)*. October 8, 2014.

Contributed Posters

[1] Ferreira R., Amstutz K., Sabbaghi A. "AMapi: An Application Programming Interface for Additive Manufacturing Systems". In: *2019 National Science Foundation Cyber-Physical Systems Program Principal Investigators Meeting*. November 22, 2019.

[2] Sabbaghi A., Francis J., Bian L. "Model Transfer Between Material Systems for Distortion Prediction in Laser-Based Additive Manufacturing". In: *2019 Joint Statistical Meetings*. July 30, 2019.

[3] Ferreira R., Sabbaghi A. "Screening and Interpreting Inputs in Machine Learning of Additive Manufacturing Systems". In: *2018 National Science Foundation Cyber-Physical Systems Program Principal Investigators Meeting*. November 15, 2018.

[4] Ferreira R., Sabbaghi A., Huang Q. "Automated Geometric Shape Deviation Modeling for Additive Manufacturing Processes via Bayesian Neural Networks". In: *2017 National Science Foundation Cyber-Physical Systems Program Principal Investigators Meeting*. November 13, 2017.

[5] Sabbaghi A. "An Algebra for Conditional Main Effects". In: *2017 Design and Analysis of Experiments (DAE 2017) Conference*. October 12, 2017.

[6] Sabbaghi A., Huang Q., Dasgupta T. "Learning and Recalibration With Small Sets of Shapes for 3D Printing". In: *2016 National Science Foundation Cyber-Physical Systems Program Principal Investigators Meeting*. October 31, 2016.

[7] Sabbaghi A., Dasgupta T., Huang Q., Zhang J. "Interference in Deformation Compensation for 3D Printing". In: *16th Meeting of New Researchers in Statistics and Probability*. August 1, 2014.

[8] Sabbaghi A., Dasgupta T., Wu C.F.J. "Indicator Functions under the Linear-Quadratic Parametrization". In: *19th Annual ASA/IMS Spring Research Conference on Statistics in Industry and Technology*. June 13, 2012.

[9] Sabbaghi A., Rubin D.B. "Who was Right about ANOVA for Latin Squares: Neyman or Fisher?". In: *2012 Atlantic Causal Inference Conference*. May 24, 2012.

Professional Service

2025 Chair-Elect of the Physical and Engineering Sciences (est. 1954) SPES/SPQP Section of the American Statistical Association.

General Conference Chair of the 2023 Fall Technical Conference.

Co-Organizer and Chair of the SPES+Q&P Student Paper Competition at the 2023 Joint Statistical Meetings (2023 JSM).

Organizer and Chair of the ML/AI for Fairness, Transparency, and Interpretability invited session at the 2022 INFORMS Annual Meeting.

Organizer and Chair of the Advances in Machine Learning and Statistics for the Automotive Industry invited session at the 2022 INFORMS Annual Meeting.

Chair of the Case Studies from the International Statistical Engineering Association invited session at the 2022 INFORMS Annual Meeting.

Panelist on the SPES Special Panel Session for the 2022 Fall Technical Conference.

Moderator of the Text Mining invited session for the 2022 Fall Technical Conference.

Co-Organizer and Chair of the Advances in Active Learning invited session at the 2022 International Conference on Advances in Interdisciplinary Statistics and Combinatorics (AISC 2022).

Chair of the 2022 QSR INFORMS Best Case Study Paper Competition.

Co-Chair of the 2022 QSR INFORMS Data Challenge Competition.

Member of the Program Committee for the 2023 Annual ASA/IMS Spring Research Conference on Statistics in Industry and Technology.

2022 Program Chair of the Physical and Engineering Sciences (est. 1954) SPES/SPQP Section of the American Statistical Association.

Member of the Scientific Program Committee for the 2022 International Conference on Advances in Interdisciplinary Statistics and Combinatorics (AISC 2022)

Chair of the Spectral Analysis, Process Monitoring, and Sampling Contributed Paper session at the 2022 Joint Statistical Meetings.

Guest Editor in the AISC-2021 Special Collection Issue of *Journal of Statistical Theory and Practice* from 2021 - 2022.

Associate Editor in the Focus Issue of Data Science, Quality and Reliability of *IISE Transactions* in 2022.

Organizer and Moderator of the Applying for SBIR/STTR Grants panel at the 2021 INFORMS Annual Meeting.

Organizer and Moderator of the Fundamentals of Start-Ups panel at the 2021 INFORMS Annual Meeting.

Organizer and Moderator of the Challenging Research Problems in the Automotive Industry panel at the 2021 INFORMS Annual Meeting.

Organizer and Chair of the Advances in Statistics and Reliability for Industry and Government invited session at the 2021 INFORMS Annual Meeting.

Co-Chair of the 2021 QSR INFORMS Data Challenge Competition.

Member of the Program Committee for the 2022 Annual ASA/IMS Spring Research Conference on Statistics in Industry and Technology (canceled due to COVID).

Council Member of the Quality, Statistics, Reliability (QSR) section of INFORMS.

Panel reviewer for the National Science Foundation SBIR/STTR program.

Director of the Purdue University Statistical Consulting Service.

Associate Director of the Purdue University Statistical Consulting Service.

Panelist in the QSR Student Introduction and Interaction and Best Student Poster Competition session at the 2020 INFORMS Virtual Annual Meeting.

Organizer and Chair of the Recent Developments Multi-Armed Bandits and Reinforcement Learning for Online Experiments invited session at the 2020 INFORMS Virtual Annual Meeting.

Organizer and Chair of the Improving Machine Learning Algorithms for Causal Inference invited session (a joint Data Mining and QSR session) at the 2019 INFORMS Annual Meeting.

Organizer and Chair of the Machine Learning for Advanced Manufacturing invited session at the 2019 INFORMS Annual Meeting.

Co-Chair of the 2019 INFORMS QSR Section Best Paper Award Competition.

Organizer and Chair of the Machine Learning Algorithms Assisted by Design Concepts invited session at the 2019 Design and Analysis of Experiments (DAE 2019) Conference.

Organizer and Chair of the Developments in Additive Manufacturing Systems invited session (a joint QSR and Data Mining session) at the 2018 INFORMS Annual Meeting.

Reviewer for the 2018 INFORMS QSR Best Paper Award and Best Student Paper Award Competitions.

ASA Section of Statistics in the Physical and Engineering Sciences (SPES) Representative for the Spring Research Conference in 2018 - 2019.

Chair of the Precision Medicine invited session at the Ninth International Purdue Symposium on Statistics.

Referee for the 46th SME North American Manufacturing Research Conference.

Organizer and Chair of the Developments in Bayesian Data Analysis invited session at the 2017 INFORMS Annual Meeting.

Organizer and Chair of the Predictive Modeling and Quality Control for Additive Manufacturing invited session at the 24th Annual ASA/IMS Spring Research Conference on Statistics in Industry and Technology.

Chair of the New Paradigms and Approaches in Modern-Day Process Monitoring contributed session at the 24th Annual ASA/IMS Spring Research Conference on Statistics in Industry and Technology.

President of the Zeta of Indiana Chapter of Phi Beta Kappa from March 2017 - July 2019.

Co-Organizer and Co-Chair of the Foundations of Accuracy for Additive Manufacturing invited session at the 2016 INFORMS Annual Meeting.

Pre-Doctoral Mentor for the National Math Alliance for Doctoral Studies in the Mathematical Sciences.

Panel reviewer for the National Science Foundation.

Chair of the Recent Developments of Bayesian High Dimensional Modeling, Inference, and Computation invited session at the 2016 ICSA Applied Statistics Symposium.

Vice President of the Zeta of Indiana Chapter of Phi Beta Kappa from March 2016 - February 2017.

Co-Organizer and Co-Chair of the Predictive Modeling and Control of Additive Manufacturing special session at the Twelfth Annual IEEE International Conference on Automation Science and Engineering.

Co-Organizer and Discussant of the Powerful Experimental Designs for Non-Gaussian Responses invited session at the 2016 Joint Statistical Meetings.

Organizer and Chair of the Statistical Methods in 3D Printing invited session at the 23rd Annual ASA/IMS Spring Research Conference on Statistics in Industry and Technology.

Co-Chair of the Predictive Modeling and Control for Additive Manufacturing invited session at the 2015 INFORMS Annual Meeting.

Organizer and Chair of the Developments in Design invited session at the 32nd Quality & Productivity Research Conference.

Invited reviewer for *Chapman & Hall/CRC Press*, *IEEE Transactions on Automation Science and Engineering*, *Journal of the American Statistical Association*, *Journal of Quality Technology*, *Journal of Statistical Planning and Inference*, *Journal of Statistical Theory and Practice*, *Nanotechnology and Precision Engineering*, *Engineering Reports*, *Procedia Manufacturing*, *Sankhya B*, *Statistica Sinica*, *Technometrics*, *The American Statistician*, the Eleventh Annual IEEE International Conference on Automation Science and Engineering, the Twelfth Annual IEEE International Conference on Automation Science and Engineering, and the 2018 INFORMS QSR Section Best Paper Award Competition.

Committee member for the Institute of Mathematical Statistics Young Researcher Group.

Chair of the Operations Management in Manufacturing contributed session at the 2013 INFORMS Annual Meeting.

Professional Memberships

American Statistical Association (ASA)
Institute of Mathematical Statistics (IMS)
Institute for Operations Research and the Management Sciences (INFORMS)
Phi Beta Kappa
Pi Mu Epsilon

Teaching Experience

Purdue University, West Lafayette, IN

Associate Professor

- Statistics 695: Causal Inference Under the Rubin Causal Model (January 2025 – May 2025)
- Statistics 699: Research PhD Thesis (August 2022 – December 2022)
- Statistics 656: Bayesian Data Analysis (August 2022 – December 2022)
- Statistics 699: Research PhD Thesis (January 2022 – May 2022)
- Statistics 598: Causal Inference (January 2022 – May 2022)
- Statistics 699: Research PhD Thesis (August 2021 – December 2021)
- Statistics 699: Research PhD Thesis (January 2021 – May 2021)
- Statistics 695: Causal Inference Under the Rubin Causal Model (January 2021 – May 2021)
- Statistics 598: Design, Bayes, and Causal (January 2021 – May 2021)
- Statistics 597: Statistical Consulting Seminar (January 2021 – May 2021)
- Statistics 582: Statistical Consulting and Collaboration (January 2021 – May 2021)
- Statistics 515: Statistical Consulting and Collaboration (January 2021 – May 2021)
- Statistics 699: Research PhD Thesis (August 2020 – December 2020)
- Statistics 695: Bayesian Data Analysis (August 2020 – December 2020)
- Statistics 598: Design, Bayes, and Causal (August 2020 – December 2020)
- Statistics 597: Statistical Consulting Seminar (August 2020 – December 2020)
- Statistics 515: Statistical Consulting and Collaboration (August 2020 – December 2020)

Assistant Professor

- Statistics 699: Research PhD Thesis (January 2020 – May 2020)
- Statistics 598: Design, Bayes, and Causal (January 2020 – May 2020)
- Statistics 597: Statistical Consulting Seminar (January 2020 – May 2020)
- Statistics 582: Statistical Consulting and Collaboration (January 2020 – May 2020)
- Statistics 515: Statistical Consulting and Collaboration (January 2020 – May 2020)
- Statistics 190: Institute Assess Data Mine (January 2020 – May 2020)
- Statistics 699: Research PhD Thesis (August 2019 – December 2019)
- Statistics 695: Bayesian Data Analysis (August 2019 – December 2019)
- Statistics 692: Statistics General Colloquium (August 2019 – December 2019)
- Statistics 598: Design, Bayes, and Causal (August 2019 – December 2019)
- Statistics 190: Institute Assess Data Mine (August 2019 – December 2019)
- Statistics 699: Research PhD Thesis (June 2019 – August 2019)
- Statistics 699: Research PhD Thesis (January 2019 – May 2019)
- Statistics 598: Design, Bayes, and Causal (January 2019 – May 2019)
- Statistics 513/IE 530: Statistical Quality Control (January 2019 – May 2019)
- Statistics 699: Research PhD Thesis (August 2018 – December 2018)
- Statistics 695: Bayesian Data Analysis (August 2018 – December 2018)
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- Statistics 695: Bayesian Data Analysis (August 2016 – December 2016)
- Statistics 598: Design, Bayes, and Causal (August 2016 – December 2016)
- Statistics 490: Experimental Design (August 2016 – December 2016)
- Statistics 699: Research PhD Thesis (June 2016 – August 2016)
- Statistics 598CI: Topics in Causal Inference (June 2016 – August 2016)
- Statistics 699: Research PhD Thesis (January 2016 – May 2016)
- Statistics 490: Experimental Design (August 2015 – December 2015)
- Statistics 692: Statistics General Colloquium (January 2015 – May 2015)
- Statistics 513/IE 530: Statistical Quality Control (January 2015 – May 2015)

Harvard University, Cambridge, MA

Teaching Fellow

- Statistics 140: Design of Experiments (January 2013 – May 2013)
  - Awarded a Certificate of Distinction in Teaching by Harvard University's Derek Bok Center for Teaching and Learning.
- Statistics 104: Introduction to Quantitative Methods for Economics (September 2010 – May 2011)
- Statistics S-100: Introduction to Quantitative Methods (June 2010 – August 2010)

Guest Lecturer

- Statistics 221: Statistical Computing and Visualization (February 13, 2013)
  - Presented a real-life example of Bayesian nonlinear regression model building and checking for quality control in additive manufacturing.

Contributor to Course Construction

- Statistics 265: Statistical Mathematics (Graduate Seminar in General Education) (January 2012 – May 2012)
  - Helped develop a General Education course for Harvard University undergraduates that interweaves calculus, probability, and statistics.
  - Wrote Chapter 6 of the course textbook (in collaboration with Carolyn Stein and Jessica Hwang) on connections between the Fundamental Theorem of Calculus and statistical concepts.
- Statistics 305: Statistical Fallacies and Paradoxes: A Cartoon Guide (Graduate Seminar in General Education) (September 2009 – December 2009)
  - Helped develop a module on Simpson's paradox and the ecological fallacy for use in Harvard University's General Education course EM 16: Real-Life Statistics: Your Chance for Happiness (or Misery).
  - Researched the historical origin of Simpson's paradox and the ecological fallacy, and major milestones in their development.
  - Summarized findings from both research and pedagogical perspectives, with an emphasis on the interplay between different disciplines, and between academia and the general public's interests in its development.
  - Prepared a "cartoon guide" of slides with pictures and diagrams to illustrate the key ideas in the most intuitive, insightful, and interesting ways possible.
  - Submitted a paper summarizing the research, and suggested homework questions and group project for Harvard University General Education students.

Purdue University, West Lafayette, IN

Teaching Assistant

- Mathematics 450: Honors Galois Theory (January 2009 – May 2009)
- Statistics 416: Probability (January 2007 – May 2007)
- Statistics 301: Elementary Statistical Methods (January 2007 – May 2007)
- Statistics 225: Introduction to Probability Models (August 2006 – December 2006)