Joshua Goldstein

Social and Decision Analytics Division, Biocomplexity Institute, University of Virginia, 1100 Wilson Blvd. Arlington, VA 22209, Email: jrg3bs@virginia.edu

Education

Ph.D. Statistics, Pennsylvania State University, 2015
Thesis title: *Compartmental, Spatial and Point Process Models for Infectious Diseases.* Thesis advisor: Dr. Murali Haran

B.S. Physics and B.S. Mathematics, Lafayette College, 2007

Employment

Research Assistant Professor, Social & Decision Analytics Division, Biocomplexity Institute, University of Virginia, Arlington, VA, 2018 - present

Research Scientist, Social & Decision Analytics Laboratory, Biocomplexity Institute of Virginia Tech, Arlington, VA, 2015 – 2018

Postdoctoral Fellow, Social & Decision Analytics Laboratory, Biocomplexity Institute of Virginia Tech, Arlington, VA, 2015 – Present.

Instructor for Stat 401 'Experimental Methods', The Pennsylvania State University, State College, PA, 2014 – 2015.

Graduate Research Assistant, The Pennsylvania State University, State College, PA, 2012 – 2015. Teaching Assistant, The Pennsylvania State University, State College, PA, 2010 – 2013.

Research Experience

U.S. Army Research Institute for Social and Behavioral Research (ARI)

Developing Predictive Models of U.S. Army Career Pathways (FY20-FY23). Principal Investigator. Led sequence analysis and model development for career progression of Army officers using DoD and external community data.

Individual and Team Performance (*FY17-FY22*), The Social Component of The Human Dimension: Leveraging Existing DoD Data Towards Optimized Individual And Team Performance in the Army. Co-Principal Investigator on this award, responsible for the data development for this project in the Department of Army's data enclave and part of the statistical modeling team.

ARI Early Career (*FY17*), Co-Principal Investigator on a U.S. Army Research Institute for Behavioral and Social Science Research Early Career Award. Developed an agent-based model in Python that simulates dynamic social networks in a hospital, and includes cognitive theory to explore the spread of knowledge in an organization.

Towards an Integrated Data Framework for Understanding the Context of Military Environments *(FY15-FY18*), Co-Principal Investigator responsible for developing a Soldier attrition model based on a Bayesian survival framework. Set up a data environment in the Department of Army's data enclave in R and SQL.

USDA Economic Research Service (FY19-FY23)

Impacts of Infrastructure Development on Rural Property Values. Principal Investigator. Examined the impact of broadband availability and subscription on prosperity and quality of life in rural communities.

Data Science for the Public Good (2015-present)

Mentored students, and led student teams as part of SDAD's Data Science for the Public Good program. These included multiple teams of undergraduate and graduate students in collaborations with the Arlington County Fire Department and Police Department, Fairfax County Department of Neighborhood and Community Services (NCS), and U.S. Army Research Institute for Behavioral and Social Science Research. Directed the process of data discovery, profiling, exploration, and statistical analysis, which led to the creation of posters for a symposium, reports, and publications.

U.S. Housing and Urban Development (FY16-FY17)

Developed novel methods for generating synthetic populations in work for the U.S. Census Bureau and Department of Housing and Urban Development to assess the identifiability of records by matching data from the American Housing Survey with local sources of property and housing data, such as property tax assessment data.

Procter & Gamble (FY15-FY16)

Built Bayesian models using massive datasets to create end-to-end supply chain optimization simulations in collaboration with Procter & Gamble. Directed a team of students from the University of Cincinnati Simulation Center to implement and expand these models.

Manuscripts

Publications

Rupasingha, A., Pender, J., Williams, R., Goldstein, J., & Mahoney-Nair, D. Place-Based Subsidies and Employment Growth in Rural America: Evidence from the Broadband Initiatives Program. *Papers in Regional Science: Accepted for Publication*

Pires, B., Goldstein, J., Molfino, E., Ziemer, K., Orr, M., & Jiménez, J. (2023). Knowledge sharing in a dynamic, multi-level organization: an agent-based modeling approach. *Computational and Mathematical Organization Theory*, 1-26.

Goldstein, J., Pender, J., & Mahoney-Nair, D. (2022). Impacts of the Broadband Initiatives Program on broadband adoption and home telework. *Telecommunications Policy*, 102365.

Ratcliff, N. J., Thurston, J., Goldstein, J. R., Lancaster, V. A., Shipp, S. S., Keller, S. A., & Ervin, K. S. (2021). Examining the population level and individual level longitudinal stability of psychosocial measures in the US Army's Global Assessment Tool (GAT). *Military Psychology*, *34*(2), 197-210.

Korkmaz, G., Kuhlman, C. J., Goldstein, J., & Vega-Redondo, F. (2020). A computational study of homophily and diffusion of common knowledge on social networks based on a model of Facebook. Social Network Analysis and Mining, 10(1), 5.

Goldstein, J., Park, J., Haran, M., Liebhold, A., and Bjørnstad, O. N. 2019. Quantifying spatio-temporal variation of invasion spread. *Proceedings of the Royal Society B*, *286*(1894), 2018-2294.

Keller, S., Shipp, S., Korkmaz, G., Molfino, E., Goldstein, J., Lancaster, V., Pires, B., Higdon, D., Chen, D., and Schroeder, A. 2018. Harnessing the Power of Data to Support Community-Based Research. *Wiley Interdisciplinary Reviews: Computational Statistics* 10.3 (2018): e1426.

Park, J., Goldstein, J., Haran, M., and Ferrari, M. (2017). "An ensemble approach to predicting the impact of vaccination on rotavirus disease in Niger," *Vaccine*, 35(43), 5835-5841.

Pires, B., Goldstein, J., Molfino, E. and Ziemer, K. "Exploring Dynamic, Multi-Level Interactions within an Organization: An Agent-based Modeling Approach," *in the post-proceedings of the Computational Social Science Conference,* 19th–22nd October, 2017, Santa Fe, NM.

Pires, B., Goldstein, J., Higdon, D., Reese, S., Sabin, P., Korkmaz, G., Ba, S., Hamall, K., Koehler, A., Shipp, S., and, Keller, S. (2017). "A Bayesian Simulation Approach for Supply Chain Synchronization", *in the post-proceedings of the 2017 Winter Simulation Conference (WSC)*, 3^{rd} – 6^{th} December, Las Vegas, NV.

Goldstein, J., Haran, M., Simeonov, I., Fricks, J., and Chiaromonte, F. (2015). "An attraction-repulsion point process model for respiratory syncytial virus infections," *Biometrics* 71:376-86

Techincal Reports

Goldstein, J., Higdon, D., Shipp, S., & Keller, S. (2021). Using Administrative and External Data Sources to Model First Term Attrition of Army Enlisted Soldiers. Army Research Institute Technical Report.

Ratcliff, N., Thurston, J., Goldstein, J., Halder, A., Mikytuck, A., Oh, E., Lancaster, V., Schroeder, A., Shipp, S., & Keller, S. (2021). Leveraging existing administrative data to predict individual performance in the Army (Modeling Phase 1 Technical Report): Simple relationship analysis. Army Research Institute Technical Report.

Ratcliff, N., Thurston, J., Linehan, K., Mikytuck, A., Oh, E., Halder, A., Goldstein, J., Lancaster, V., Schroeder, A., Shipp, S., Keller, S. (2021). A 20-year review of accession characteristics in the U.S. Army. Army Research Institute Technical Report.

Pristavec, T., Kramer, B., Goldstein, J., Keller, S., Gregory, M., & Tobin, J. (2021). Modeling Neighborhood Change to Mitigate Gentrification: A Case Study of Fairfax County, VA. https://doi.org/10.18130/bjbm-f119

Goldstein, J., Molfino, E., Keller, S., Higdon, D. (2016). "Uniqueness Assessment for American Housing Survey Records: a Pseudouniverse Approach," Social and Decision Analytics Laboratory in the Biocomplexity Institute of Virginia Tech.

Conferences

Goldstein, J., Halder, A., & Charankevich, H. (2022). Gradient Assessment to Evaluate the Impact of Broadband Subsidy Programs. 2022 Joint Statistical Meetings, Washington, D.C., August 6-11.

Goldstein, J., Halder, A., Oh, E., Ratcliff, N., Thurston, J., Schroeder, J., Shroeder, A., Shipp, S., & Keller, S. (2022). Developing Predictive Models of U.S. Army Career Pathways. 90th Military Operations Research Society Symposium, Quantico, VA, June 13-16.

Goldstein, J., Halder, A., Pender, J., Schroeder, A., Mahoney-Nair, D., Kattampallil, N., Shipp, S., & Keller, S. (2021). Evaluation of Broadband Subsidy Programs: Combining Spatial Regression Discontinuity Designs and Bayesian Wombling. 2021 Joint Statistical Meetings, online, August 8-12.

Goldstein, J., Halder, A., Charankevich, H., Kattampallil, N., Schroeder, A., Pender, J., Shipp, S., Keller, S. (2021). Measuring the Impact of the Broadband Initiatives Program on Property Values. The 68th North America Meetings of the Regional Science Association, Denver, CO, November 8-13.

Neville, Q., Pristavec, T., & Goldstein, J. (2020). Measuring and mapping obesogenic environments with latent variable composite indices in Fairfax County, Virginia. Paper presented at the 2020 Joint Statistical Meetings, online, August 3.

Pender, J., Goldstein, J., Pristavec, T., Mahoney-Nair, D., Shipp, S., Kattampallil, N., Schroeder, A., Keller, S., & Keeler, Z. (2020). Impacts of the Broadband Initiatives Program on rural prosperity. Paper presented at the Agricultural and Applied Economics Association Community and Regional Economics Network annual meeting, online, August 18.

Goldstein, J. and Ratcliff, N., 2018. "Dynamic Modeling of U.S. Army Administrative Data." *MORS Emerging Techniques Forum*, 4th – 5th December, Alexandria, VA.

Goldstein, J., 2018, "Leveraging U.S. Army Administrative Data for Individual and Team Performance." *ADRF Network Research Conference*, 13th –14th November, Washington, DC.

Goldstein, J. and Higdon, D., 2018. Redistributing Data and Estimates Across Geographies using Synthetic Populations. *Presentation at Joint Statistical Meetings (JSM)*, 28th July – 2nd August, Vancouver, CA.

Goldstein, J., Higdon, D., Pires, B., Keller, S., Shipp, S., and Lancaster,V.,2018. Leveraging Access to and Use of Department of Defense Data: A Case Study of Unraveling Military Attrition Through New Approaches to DoD Data Integration. 2018. *Presentation at the FCSM Research and Policy Conference*, 7th – 9th March, Washington, DC.

Goldstein, J. and Pires, B., 2017, "Exploring Dynamic, Multi-level Interactions within an Organization: An Agent-based Modeling Approach." *Presentation at the Military Operations Research Society (MORS) Symposium*, 19th – 22nd June, West Point, NY.

Goldstein, J., Pires, B., Higdon, D., Korkmaz, G., Keller, S., Shipp, S., Hamall, K., and Koehler, A., 2016, "A Bayesian Simulation Approach for Supply Chain Synchronization." *Poster presented at the Winter Simulation Conference (WSC)*, 11th – 14th December, Arlington, VA.

Goldstein, J., 2015, "Spatial local gradient models of biological invasions and epidemics.". *Presentation at the RAPIDD workshop on Gravity Models, Disease Spread and Spatial Scales*, 6th – 9th September, Cambridge, UK.

Goldstein, J., 2015, "Modeling and inference for rotavirus dynamics in Niger." *Presentation at the Joint Statistical Meetings (JSM)*, 8th – 13th August, Seattle, WA.

Goldstein, J., 2015, "Modeling and inference for rotavirus dynamics in Niger." *Presentation at East North American Region International Biometric Society Conference (ENAR)*, 15th – 18th March, Miami, FL.

Goldstein, J. 2014, “An attraction-repulsion point process model for RSV infections." *Winner of student poster competition at Graybill/ENVR Conference on Modern Statistical Methods in Ecology*, 7th – 10th September, Fort Collins, CO.

Goldstein, J. 2014, “An attraction-repulsion point process model for RSV infections." *Poster presented at Joint Statistical Meetings (JSM)*, 6th – 8th August, Boston, MA.

Goldstein, J., 2012, “An attraction-repulsion point process model for RSV infections." *Poster presented at ENVR workshop on Environmetrics*, 3rd – 5th October, Raleigh, NC.

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