

Erin Rae Leatherman

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<https://www2.kenyon.edu/Depts/Math/Leatherman/>

EDUCATION

Ph.D. Statistics, The Ohio State University, 2013

Dissertation: “Optimal Predictive Designs for Experiments that Involve Computer Simulators”

Co-Advisors: Angela M. Dean and Thomas J. Santner

M.S. Applied Statistics, Bowling Green State University, 2008

B.A. Mathematics, Bluffton University, 2006

POSITIONS HELD

Associate Professor, Department of Mathematics & Statistics, Kenyon College, 2022 – present

Assistant Professor, Department of Mathematics & Statistics, Kenyon College, 2018 – 2022

Assistant Professor, Department of Statistics, West Virginia University (WVU), 2013 – 2018

RESEARCH INTERESTS

Computer experiments, including prediction and design for simulator and physical experiments.
Development and use of statistical methodology in collaborative scientific settings.

SELECTED HONORS AND AWARDS

- Trustee Teaching Excellence Award for Junior Faculty Member, Kenyon College, April 2021
- Shewell Award, Honorable Mention, Fall Technical Conference, October 2014
- Craig Cooley Memorial Prize, The Ohio State University, May 2013
- Best Student Poster Award, DAE 2012 (Design & Analysis of Experiments), October 2012
- Thomas and Jean Powers Teaching Award, The Ohio State University, June 2010
- University Fellowship, The Ohio State University, September 2008–August 2009
- J.P. Morgan Chase Fellowship, The Ohio State University, Spring 2008
- James A. Sullivan Outstanding Graduate Student Award, Bowling Green State University, Spring 2008
- Robert A. Patton Book Scholarship, Bowling Green State University, Fall 2007
- Academic Scholarship with Honors, Bluffton University, All Semesters 2002-2006

PUBLICATIONS

(* indicates Kenyon student)

11. Ryan, K.J., *Brydon, M.S., **Leatherman, E.R.**, Hamada, M.S., (2022), “Analysis of Overlapping Count Data,” *Communications in Statistics - Simulation and Computation*, <https://doi.org/10.1080/03610918.2022.2126496>.
10. Chen, T., Pekmezian, A., **Leatherman, E.R.**, Santner, T.J., Maher, S.A., (2022), “Tekscan Analysis Programs (TAP) for Quantifying Dynamic Contact Mechanics,” *Journal of Biomechanics*, 136, 111074, <https://doi.org/10.1016/j.jbiomech.2022.111074>.
9. Dakhllallah, D.A., Wisler, J., Gencheva, M., Brown, C.M., **Leatherman, E.R.**, Singh, K., Brundage, K., Karsies, T., Dakhllallah, A., Witwer, K.W., Sen, C.K., Eubank, T.D., Marsh, C.B., (2019), “Circulating Extracellular Vesicle Content Reveals de Novo DNA Methyltransferase Expression as a Molecular Method to Predict Septic Shock,” *Journal of Extracellular Vesicles*, 8:1, <http://dx.doi.org/10.1080/20013078.2019.1669881>.
8. Hepler, S.A., **Leatherman, E.R.** (2018), *Instructor’s Solutions Manual for Moore, Notz, and Fligner’s The Basic Practice of Statistics*, Eighth Edition, W. H. Freeman and Company, New York.
7. **Leatherman, E.R.**, Santner, T.J., Dean, A.M. (2018), “Computer Experiment Designs for Accurate Prediction,” *Statistics and Computing*, 28, 739–751. <http://dx.doi.org/10.1007/s11222-017-9760-8>.

Supplemental Design Material:

<https://www2.kenyon.edu/Depts/Math/Leatherman/CompExpDesgs.Pred/>

6. Bell, J.L., Taylor, M.A., Chen, G.X., Kirk, R.D., **Leatherman, E.R.** (2017), “Evaluation of an in-vehicle monitoring system (IVMS) to reduce risky driving behaviors in commercial drivers: Comparison of In-Cab Warning Lights and Supervisory Coaching with Videos of Driving Behavior,” *Journal of Safety Research*, 60, 125–136, <http://dx.doi.org/10.1016/j.jsr.2016.12.008>.

Paper nominated for CDC/ATSDR Charles C. Shepard Science Award.

5. **Leatherman, E.R.**, Dean, A.M., Santner, T.J. (2017), “Designing Combined Physical and Computer Experiments to Maximize Prediction Accuracy,” *Computational Statistics & Data Analysis*, 113, 346–362 <http://dx.doi.org/10.1016/j.csda.2016.07.013>.

Supplemental Design Material:

<https://www2.kenyon.edu/Depts/Math/Leatherman/CombinedDesigns/>

4. Churilla, T. M., Donnelly, P. E., **Leatherman, E. R.**, Adonizio, C. S. and Peters, C. A. (2015), “Total Mastectomy or Breast Conservation Therapy? How Radiation Oncologist Accessibility Determines Treatment Choice and Quality: A SEER Data-base Analysis,” *The Breast Journal*, 21(5): 473–480, <http://dx.doi.org/10.1111/tbj.12449>.
3. **Leatherman, E.R.** (2014), “The R Student Companion,” *The American Statistician* (Book Review) 68(4), 312–313, <http://dx.doi.org/10.1080/00031305.2014.970881>.

2. **Leatherman, E.R.**, Dean, A.M., Santner, T.J. (2014), “Computer Experiment Designs via Particle Swarm Optimization.” In Melas, V.B., Mignani, S., Monari, P., Salmaso, L. (Eds.), Topics in Statistical Simulation: Research from the 7th International Workshop on Statistical Simulation (pp. 309–317). New York: Springer, http://dx.doi.org/10.1007/978-1-4939-2104-1_30.
1. **Leatherman, E.R.**, Guo, H., Gilbert, S.L., Hutchinson, I.D., Maher, S.A., Santner, T.J. (2014), “Using a Statistically Calibrated Biphasic Finite Element Model of the Human Knee Joint to Identify Robust Designs for a Meniscal Substitute,” Journal of Biomechanical Engineering, 136(7), <http://dx.doi.org/10.1115/1.4027510>.

PRESENTATIONS AND POSTERS

(bold indicates presenter, * indicates Kenyon student)

10. ***Brydon, M.S.**, Leatherman, E.R., Ryan, K.J., Hamada, M.S., “Parameter Estimation for Overlapping Poisson Count Data,” Fall Technical Conference 2019, National Institute of Standards and Technology, Gaithersburg, Maryland, contributed talk, September 2019.
9. **Leatherman, E.R.**, Dean, A.M., Santner, T.J., “Designing Combined Physical and Computer Experiments to Maximize Global Prediction Accuracy,” International Conference on Design of Experiments 2019, The University of Memphis, Memphis, Tennessee, invited talk for Opening Session, May 2019.
8. **Leatherman, E.R.**, Santner, T.J., Dean, A.M., “Designing Combined Physical and Computer Experiments to Maximize Prediction Accuracy,” Los Alamos National Lab, Los Alamos, NM, invited talk, January 2019.
7. **Leatherman, E.R.**, Dean, A.M., Santner, T.J., “Designing Computer Experiments to Maximize Prediction Accuracy,” Joint Statistical Meetings 2017, Baltimore, Maryland, invited talk, August 2017.
6. **Leatherman, E.R.**, Santner, T.J., Dean, A.M., “Designing Combined Traditional and Simulator Experiments,” Association for Women in Mathematics Research Symposium 2015, University of Maryland, invited talk, April 2015.
5. **Leatherman, E.R.**, Dean, A.M., Santner, T.J., “Optimal Bayesian Designs for Combined Physical and Deterministic Simulator Experiments,” Fall Technical Conference 2013, San Antonio, Texas, contributed talk, October 2013, *Shewell Award, Honorable Mention*.
4. **Leatherman, E.R.**, Santner, T.J., Dean, A.M., “Designing Physical and Computer Experiments That Minimize the Bayesian Integrated Mean Square Prediction Error,” Design and Analysis of Experiments 2012, University of Georgia, invited poster, October 2012, *Awarded Best Student Poster*.
3. **Leatherman, E.R.**, Dean, A.M., Santner, T.J., “Designs for Computer Experiments that Minimize the Bayesian Integrated Mean Square Prediction Error,” IMS/ASA Spring Research Conference 2012, Harvard University, contributed talk, June 2012.
2. **Leatherman, E.R.**, “Computer Experiments and their Designs,” Ralph C. St. John Guest Speaker Series, Bowling Green State University, invited talk, March 2012.

1. **Leatherman, E.R.**, Santner, T.J., Dean, A.M., “The Role of Experimental Design in Calibration,” Workshop on Accelerating Industrial Productivity via Deterministic Computer Experiments and Stochastic Simulation Experiments, Isaac Newton Institute for Mathematical Sciences, contributed poster, September 2011.

GRANT FUNDING

3. US DHHS-NIH-National Institute of Arthritis, Musculoskeletal & Skin Diseases, Research Project Grant Program (R01), “How partial meniscectomy affects contact mechanics and tissue response,” Co-I statistical collaborator, August 2019 - April 2024, funded \$1,878,903 (my task \$161,485)
2. NIH/NIGMS, “WVCTSI Clinical Research Design, Epidemiology, and Biostatistics (CRDEB) Program”, Co-I statistical consultant, Aug 2016 - June 2017, funded \$19,581,898 (my task \$10,481)
1. US Dept of Health and Human Services/CDC/NIOSH, Co-I statistical consultant, Sept 2014-Sept 2015, funded \$45,704.88 (my task \$32,832)

TEACHING

Kenyon College, Department of Mathematics and Statistics

- STAT 106: Elements of Statistics, F18, S19, S20 (x2), F20 (x2), F21, S22 (x2), F22 (x2)
- STAT 206: Data Analysis, F18, F19, F20, F21, F22
- STAT 306: Experimental Design, S22
- STAT 416: Linear Regression Models, S19
- MATH 291: Topological Data Analysis, S20
- MATH 491: Senior Seminar in Mathematics, F19

West Virginia University, Department of Statistics

- STAT 312: Intermediate Statistical Methods, F13 – F14, S16, F16 (x2), F17, S18
- STAT 331/531: Sampling Methods/Sampling Theory and Methods, S14, S18
- STAT 494/696: Seminar: Capstone/Graduate Seminar, S15
- STAT 561: Theory of Statistics 1, F17
- STAT 645: Linear Models, F15
- STAT 791: Computational Statistics, F14, S16

The Ohio State University, Department of Statistics (on quarters)

- STAT 135: Elementary Statistics Lecture, F09 – Sum10
- STAT 135: Elementary Statistics Lab, W09, S09

Bowling Green State University, Department of Applied Statistics and Operations Research

- STAT 211: Elementary Statistical Methods I, S07, S08

STUDENT ADVISING AND COMMITTEES

Kenyon Undergraduate:

(Kenyon Summer Science Scholars denoted KSSS)

- I. Beshentseva, KSSS, “Sensitivity Analysis for Non-Rectangular Computer Experiment Input Spaces”, Summer 2022
- Z. Monaghan, Scientific Computing Senior Capstone Project, “Algorithmic Trading”, Spring 2022
- R. Schultz, KSSS, “Enhancing the Adaptive Partitioning Design Algorithm”, Summer 2020
- M. Brydon, individual study and KSSS, “Parameter Estimation for Overlapping Poisson Count Data”, Spring - Summer 2019
- B. Baitan, KSSS, “Computer Experiment Design”, Summer 2019
- S. Lucas, KSSS, “Sensitivity Analysis for Computer Experiments with Quantitative and Qualitative Inputs”, Summer 2019
- J. Potter, Scientific Computing Senior Capstone Project, “Optimization of IMSPE for Computer Experiment Design”, Spring 2019

WVU Undergraduate:

- J. Ingabire, Senior Capstone Project, “Applications of Machine Learning on Large, Complex Datasets,” Industrial Mathematics and Statistics, 2017 - 2018
- A. Doering, Undergraduate Honors Course Contract, “Hierarchical Agglomerative Clustering in Outsole Examination,” Forensic & Investigative Sciences, Fall 2016
- A. Rocchio, Senior Capstone Project, “Statistical Inference Using Bootstrap Methods,” Industrial Mathematics and Statistics, 2015

WVU Graduate:

- G. Madrid, EdD Dissertation, “Effect of Individual Cultural Speeches on Accuracy and Cultural Content Knowledge of Intermediate Spanish Students,” Curriculum and Instruction/Literacy Studies, 2017, committee member
- A. Fadahunsi, PhD Dissertation, “Applications of the Scaled Laplace Transform in some Financial and Risk Models,” Computational Statistics, 2016, committee member
- B. Garai, PhD Dissertation, “Recovery of the Regression Functions and Distributions in Some Incomplete Models,” Computational Statistics, 2016, committee member
- A. Tafreshian, Master’s Thesis, “A Kriging Method for Modeling Cycle Time-Throughput Profiles in Manufacturing,” Industrial Engineering, 2016, committee member

SERVICE TO THE PROFESSION

- Council of Sections Elected Representative, Physical and Engineering Sciences Section of the American Statistical Association, 2022 – 2024

ARTICLES REVIEWED

Number of reviews in parentheses.

Statistica Sinica (3), Technometrics (3), The American Statistician (2), J. of Statistics Education (2), Communications in Statistics - Simulation and Computation (1), J. of Computational and Graphical Statistics (1), Computational Statistics & Data Analysis (1), Environmetrics (1), Statistics and Probability Letters (1)

PROFESSIONAL MEMBERSHIP

The American Statistical Association, Caucus for Women in Statistics

last updated: October 13, 2022