

Matthew D. Beckman

421 Thomas Building, 461 Pollock Road, University Park, PA 16802

(814) 863-1022 | beckman@psu.edu

ACADEMIC EMPLOYMENT

Penn State University

Department of Statistics

2016 - Present

University Park, PA

Associate Research Professor (2022 - Present)

Director, Consortium for the Advancement of Undergraduate Statistics Education (2024 - present)

Affiliated Faculty, Social Science Research Institute (2024 - present)

Assistant Research Professor (2016 - 2022)

Saint Olaf College

Department of Mathematics, Statistics, & Computer Science

2015

Northfield, MN

Instructor / Adjunct Faculty (Spring 2015)

University of Minnesota

Department of Educational Psychology

2008 - 2009

Minneapolis, MN

Teaching Specialist / Adjunct Faculty (Fall 2008; Spring 2009)

INDUSTRY EMPLOYMENT

Medtronic, Plc—Neuromodulation

Quality; Operations

2008 - 2013; 2014 - 2015

Minneapolis, MN

Senior Statistician (2010 - 2013; 2014 - 2015)

Statistician (2008 - 2010)

Nonin Medical, Inc

Senior Biostatistician

2013 - 2014

Ecolab, Inc

Research, Development & Engineering

2007 - 2008

Eagan, MN

Statistical Sciences Intern

EDUCATION

Ph.D. Educational Psychology (QME: Statistics Education)

University of Minnesota

2015

Minneapolis, MN

Dissertation: Assessment of Cognitive Transfer Outcomes for Introductory Statistics Students.

Co-Advisors: Joan Garfield & Robert C. delMas

M.S. Statistics

University of Minnesota

2008

Minneapolis, MN

Thesis: Equivalence testing in quality control.

Advisor: Douglas M. Hawkins

B.S. Mathematics

Pennsylvania State University

2006

University Park, PA

TEACHING

Penn State University

University Park, PA

STAT 184: Introduction to R	<i>Fall 2016; (...); Spring 2023</i>
STAT 200: Elementary Statistics	<i>Fall 2022; (...); Spring 2024</i>
STAT 250: Introductory Biostatistics	<i>Spring 2016; Fall 2016</i>
STAT 300: Statistical Modeling I	<i>Spring 2024</i>
STAT 380: Data Science w. Statistical Reasoning & Computing	<i>Spring 2019</i>
STAT 470W: (Capstone) Problem Solving & Comm. in Statistics	<i>Fall 2017; (...); Spring 2023</i>
STAT 501: Regression	<i>Summer 2018; Summer 2019</i>
STAT 592: Teaching Statistics	<i>Spring 2016</i>
STAT 597: Statistics Education Research Seminar	<i>Spring 2017; (...); Spring 2022</i>
PSU 016: First Year Seminar (Statistics & Data Sciences Majors)	<i>Fall 2016; (...); Fall 2023</i>

Saint Olaf College

Northfield, MN

STAT 212: Statistics for the Sciences	<i>Spring 2015</i>
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University of Minnesota

Minneapolis, MN

EPSY 5261: Introductory Statistical Methods	<i>Fall 2008; Spring 2009; Fall 2014</i>
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Medtronic, Inc

Minneapolis, MN

Instructor for Professional Development Workshops (approx. quarterly) 2008 - 2015

- Preclinical Study Design
- Design and Analysis of Experiments
- Statistical Methods for Engineers

Ecolab, Inc

Eagan, MN

Instructor for Professional Development Workshops (approx. 1-2 per month) 2007 - 2008

- Statistical Process Control
- Measurement Systems Analysis
- Design of Experiments
- Robust Design and Specification Analysis

Corry Area School District

Corry, PA

Algebra Teacher (9th grade) Summer 2006

MENTORSHIP

Elizabeth Eisenhauer

Graduated 2022

PhD co-Advisor (with Ephraim Hanks)

- Dissertation: *Advances in stochastic models for animal movement and assessment of attitudes toward probability*
- Employment: Statistician at Westat

Sayali Phadke

Graduated 2022

PhD co-Advisor (with David Hunter)

- Dissertation: *Measurement, assessment, and improvement of statistical literacy in relevant contexts*
- Employment: Assistant Professor at Penn State Behrend (tenure track)

Alyssa Hu

Expected graduation: 2024

PhD Advisor

- Research interests: Computational thinking during data analysis; curriculum evaluation; analysis of inter-rater agreement

Susan Lloyd

Expected graduation: 2024

PhD co-Advisor (with Nicole Lazar)

- Research interests: formative assessment; educational assessment development; topological data analysis

Faculty Mentorship

- (2022 - present) Neil Hatfield, Assistant Research Professor at Penn State
- (2022 - present) Jenny Shook, Assistant Teaching Professor at Penn State
- (2023 - present) V. N. Vimal Rao, Assistant Teaching Professor at Univ of Illinois, Urbana-Champaign
- (2024 - present) Jennifer Broatch, Associate Professor at Arizona State University

PhD Committee Membership

- Kristin Passero (Molecular, Cellular, and Integrative Biosciences); Graduation: 2023
- Matthew Black (Mathematics Education); Expected graduation: 2024
- Emilee Herman (Educational Psychology); Expected graduation: 2025
- Abby Sine (Statistics); Expected graduation: 2025
- Zachary Meyers (Educational Psychology); Expected graduation: 2026

PUBLICATIONS

Peer-reviewed

*student collaborators in **bold**; asterisk (*) indicates undergraduate*

- Eisenhauer, E., Beckman, M. D., & Hanks, E. M. (in review). Survey of Probability Attitudes.
- **Hu, A.**, Hatfield, N. J., & Beckman, M. D. (in review). Exploring Individuals' Computational Thinking with Data.
- Beckman, M. D., **Burke***, **S.**, **Fiochetta***, **J.**, **Fry***, **B.**, **Lloyd, S. E.**, **Patterson***, **L.**, & **Tang, E.** (in review). Developing Consistency Among Undergraduate Graders Scoring Open-Ended Statistics Tasks. Preprint URL: <https://arxiv.org/abs/2410.18062>
- **Lloyd, S. E.**, Hatfield N. J., Beckman M. D, & Lazar, N. (accepted). Student Conceptualizations of Confidence Interval Attributes. *Proceedings of the 27th Annual Conference on Research in Undergraduate Mathematics Education*.
- **Hu, A.**, Hatfield, N.J., Beckman, M.D. (2024). Exploring How Undergraduate Students Engage in Computational Thinking with Data. In Cook, S., Katz, B. & Moore-Russo D. (Eds.). *Proceedings of the 26th Annual Conference on Research in Undergraduate Mathematics Education. Omaha, NE*. URL: <http://sigmaa.maa.org/rume/Site/Proceedings.html>
- Phadke, S., Beckman, M. D., & Lock Morgan, K. (2024). Examining the Role of Context in Statistical Literacy Outcomes using an Isomorphic Assessment Instrument. *Statistics Education Research Journal*, 23(1). <https://doi.org/10.52041/serj.v23i1.529>
- **Li, Z.**, **Lloyd, S.**, Beckman, M. D., & Passonneau, R. J. (2023). Answer-state Recurrent Relational Network (AsRRN) for Constructed Response Assessment and Feedback Grouping. *Findings of the Association for Computational Linguistics: EMNLP 2023*. <https://doi.org/10.18653/v1/2023.findings-emnlp.254>

- **Lloyd, S. E.**, Beckman, M., Pearl, D., Passonneau, R., **Li, Z.**, & **Wang*, Z.** (2022). Foundations for AI-Assisted Formative Assessment Feedback for Short-Answer Tasks in Large-Enrollment Classes. In S. A. Peters, L. Zapata-Cardona, F. Bonafini, & A. Fan (Eds.), *Bridging the Gap: Empowering & Educating Today's Learners in Statistics*. Proceedings of the 11th International Conference on Teaching Statistics (ICOTS-11), Rosario, Argentina. ISI/IASE.
- Derr, T., James, M., Kuny, C., Patel, D., Kandel, P., Field, C., Beckman, M., Hockett, K., Bates, M., Sutton, T., & Szpara, M. (2022). Aerosolized Hydrogen Peroxide Decontamination of N95 Respirators, with Fit-Testing and Virologic Confirmation of Suitability for Re-Use During the COVID-19 Pandemic. *mSphere*, 7(5).
- **Eisenhauer, E.**, Hanks, E. M., Beckman, M. D., Murphy, R., Miller, T., & Katzner, T. (2022). A Flexible Movement Model for Partially Migrating Species. *Spatial Statistics*. <https://doi.org/10.1016/j.spasta.2022.100548>
- Beckman, M. D., Çetinkaya-Rundel, M., Horton, N. J., Rundel, C. W., Sullivan, A. J., & Tackett, M. (2021). Implementing Version Control With Git and GitHub as a Learning Objective in Statistics and Data Science Courses. *Journal of Statistics and Data Science Education*, 29(1). <https://doi.org/10.1080/10691898.2020.1848485>
- Agole, D., Baggett, C., Brennan, M. A., Ewing, J. C., Yoder, E. P., Mikoni, S. B., Beckman, M. D., & Epeju, W. F. (2021). Determinants of Participation of Young Farmers with and without Disability in Agricultural Capacity-building Programs Designed for the Public in Uganda. *Sustainable Agriculture Research*, 10(2), 74-86. <https://doi.org/10.5539/sar.v10n2p74>
- Agole, D., Yoder, E., Brennan, M. A., Baggett, C., Ewing, J., Beckman, M., & Matsiko, F. B. (2021). Determinants of cohesion in smallholder farmer groups in Uganda. *Advancements in Agricultural Development*, 2(1), 26-41. <https://doi.org/10.37433/aad.v2i1.73>
- Beckman, M. D., & delMas, R. C. (2018). Statistics students' identification of inferential model elements within contexts of their own invention. *ZDM Mathematics Education* 50(7). DOI: 10.1007/s11858-018-0986-5
- Beckman, M. D., & delMas, R. C. (2018). Cognitive transfer assessment in post-secondary statistics. In M. A. Sorto, A. White, & L. Guyot (Eds). *Proceedings of the 10th international conference on teaching statistics (ICOTS-10)*. Kyoto, Japan.
- Beckman, M. D., delMas, R. C., & Garfield, J. (2017). Cognitive transfer outcomes for a simulation-based introductory statistics curriculum. *Statistics Education Research Journal* 16(2).

eBooks

- Pearl, D. K., Hatfield, N. J., & Beckman, M. D. (2021). *The Book Of Apps for Statistics Teaching (BOAST)*. eBook URL: <https://shinyapps.science.psu.edu>
- Kaplan, D. & Beckman, M., (2020). *Data Computing (2nd edition)*. eBook URL: <https://dtkaplan.github.io/DataComputingEbook/>
- Beckman, M., Guerrier, S., **Lee, J.**, Molinari, R., Orso, S., & Rudnytskyi, I. (2019). *An Introduction to Statistical Programming Methods with R*. eBook URL: [https://smac-group.github.io/ds/\(authors alphabetical\)](https://smac-group.github.io/ds/(authors%20alphabetical))

Miscellaneous

- Beckman, M. D. (2024). Data for analysis of consistency among undergraduate graders scoring open-ended statistics tasks. DOI: 10.6084/m9.figshare.27327774

- Li, Z., Lloyd, S.E., Beckman, M.D., and Passonneau, R. J. (2023). I-STUDIO: A Reliable Statistical Automatic Short Answer Assessment Dataset. Penn State Data Commons. <https://doi.org/10.26208/JFMP-V777>.
- Beckman, M. D. (2017) Review of the book Fluke: the Math and Myth of Coincidence. *The American Statistician* 71(3), 285-286.
- Beckman, M. (2017, August 29). Thoughts on Teaching SBI in a Large Classroom [invited blog post]. Retrieved from <https://www.causeweb.org/sbi/?p=1501#more-1501>
- Beckman, M., Brown, E., delMas, R., Fry, E., Justice, N., Sabbag, A. (2014, November 21). Simulation-based statistical inference: Different tools for different audiences [invited blog post]. Retrieved from <https://www.causeweb.org/sbi/?p=422#more-422>

PRESENTATIONS

Talks

*student collaborators in **bold**; asterisk (*) indicates undergraduate*

- Beckman, M. (2024). Research evaluating NLP tools designed to assist instructors with formative assessment for students in large-enrollment STEM education classes. *Department Seminar (School of Psychology and Neuroscience)*. University of Glasgow. Glasgow, Scotland.
- Beckman, M. (2024). Research evaluating NLP tools designed to assist instructors with formative assessment for students in large-enrollment STEM education classes. *Technology Enhanced Mathematical Sciences Education (TEMSE) Seminar*. University of Edinburgh. Edinburgh, Scotland.
- Beckman, M. (2024). Research evaluating NLP tools designed to assist instructors with formative assessment for students in large-enrollment STEM education classes. *Department Seminar (Mathematics; Virtual)*. Texas State University.
- Beckman, M. (2024). Progress toward NLP-assisted formative assessment feedback. *Joint Statistical Meetings*. American Statistical Association. Portland, OR.
- Beckman, M. (2024). Research evaluating NLP tools designed to assist instructors with formative assessment for students in large-enrollment STEM education classes. *U.K. Conference on Teaching Statistics*. Royal Statistical Society. Manchester, England.
- Beckman, M. (2024). (Plenary Panel) The Future of UKCOTS. *U.K. Conference on Teaching Statistics*. Royal Statistical Society. Manchester, England.
- Beckman, M. (2024). Statistics & Data Sciences Education Research. *PSU Statistics Department Research Day*. University Park, PA.
- Beckman, M. (2023). Progress toward natural language processing (NLP) assisted formative assessment feedback. *SSRI QuantDev Seminar Series*. Penn State Social Science Research Institute. University Park, PA.
- Beckman, M. (2023). Progress toward natural language processing (NLP) assisted formative assessment feedback. *Symposium on Statistics and Data Science Education: Connecting Disciplines*. Statistical Society of Australia & Queensland University of Technology. Brisbane, Australia.
- Beckman, M. (2023). Mind the Gap: An incomplete picture of statistics, statisticians, & statistics education. *The Thirteenth International Research Forum on Statistical Reasoning, Thinking, and Literacy (SRTL-13)*. Maleny, Australia. (Keynote address)

- Beckman, M. (2023). Foundations for scalable NLP-assisted formative assessment feedback. *Colloquium Sponsored by Montana State University Department of Mathematical Sciences*. Bozeman, MT.
- Beckman, M. (2023). Statistics & Data Sciences Education Research. *PSU Statistics Department Research Day*. University Park, PA.
- **Lloyd, S. E.**, Beckman, M., Pearl, D., Passonneau, R., **Li, Z.**, & **Wang*, Z.** (2022). Foundations for AI-Assisted Formative Assessment Feedback for Short-Answer Tasks in Large-Enrollment Classes. *Eleventh International Conference on Teaching Statistics*. International Statistical Institute. Rosario, Argentina.
- Beckman, M., & Le, L. (2022). Connecting and supporting data science education researchers through the CAUSE Organization. *ACM Conference on International Computing Education Research*. Association for Computing Machinery. Lugano, Switzerland.
- Beckman, M., Çetinkaya-Rundel, M., Dogucu, M., **Dragich*, E.**, *Legacy, C.*, Tackett, M., & Zieffler, A. (2022). Piloting a new assessment tool for data science education researchers. *ACM Conference on International Computing Education Research*. Association for Computing Machinery. Lugano, Switzerland.
- **Lloyd, S. E.**, Beckman, M., Pearl, D., Passonneau, R., **Li, Z.**, & **Wang*, Z.** (2022). Foundations for NLP-Assisted Formative Assessment Feedback for Short-Answer Tasks in Large-Enrollment Classes. *ICSA Symposium*. International Chinese Statistical Association. Gainesville, FL.
- Beckman, M., Desjardens, C., Lendway, L. (2021). Reimagining the Role of EDA in Science and the Classroom. *US Conference on Teaching Statistics*. Consortium for the Advancement of Undergraduate Statistics Education. Virtual Conference (COVID-19). (*80-minute hands-on breakout session*)
- Beckman, M. (2020). Assessment and evaluation tools for the undergraduate statistics major. *Colloquium Sponsored by University of Minnesota Department of Educational Psychology*. Minneapolis, MN.
- Beckman, M. (2020). Version control as a learning objective in statistics courses. *Twin Cities Stat Chat*. Saint Paul, MN. (*90-minute hands-on seminar*)
- Beckman, M. (2019). Novel assessment tools for improving learning: Early lessons from statistics. *Innovative Teaching at Penn State (ITAP) Series sponsored by Schreyer Institute for Teaching Excellence*. University Park, PA.
- Beckman, M. (2020). Implementing Version Control with Git as a Learning Objective in Statistics Courses. *Joint Statistical Meetings*. American Statistical Association. Virtual Conference (COVID-19).
- Beckman, M. (2019). Capstone assessment for the undergraduate statistics major. *Nationally broadcast webinar sponsored by the Consortium for the Advancement of Undergraduate Statistics Education (CAUSE)*.
- Sullivan, A, Beckman, M. (2019). Implementing reproducible research in statistics courses using Git/GitHub. *US Conference on Teaching Statistics*. Consortium for the Advancement of Undergraduate Statistics Education. University Park, PA. (*80-minute hands-on breakout session*)
- Beckman, M. (2019). Capstone Assessment Tools for the Undergraduate Statistics Major. *Joint Statistical Meetings*. American Statistical Association. Denver, Colorado.
- Beckman, M. (2018). Effective pedagogy in large-enrollment statistics courses. *Joint Statistical Meetings*. American Statistical Association. Vancouver, Canada.

- Beckman, M., delMas, R. (2018). Assessment of cognitive transfer outcomes for introductory statistics students. *Tenth International Conference on Teaching Statistics*. International Statistical Institute. Kyoto, Japan.
- Beckman, M., delMas, R. (2017). Assessing student understanding of statistical models: Connecting data, chance and context. *The Tenth International Research Forum on Statistical Reasoning, Thinking, and Literacy (SRTL-10)*. Rotorua, New Zealand.
- Beckman, M., Kaplan, D. (2017). Teaching authentic data science without pre-requisites. *US Conference on Teaching Statistics*. Consortium for the Advancement of Undergraduate Statistics Education. University Park, PA. (*80-minute hands-on breakout session*)
- Beckman, M. (2017). The interplay of statistical thinking and the scientific method. *Colloquium Sponsored by Westminster College Division of Biological, Chemical and Environmental Sciences*. New Wilmington, PA.
- Beckman, M. (2017). GAISEing at a lecture hall: effective pedagogy in large-enrollment courses. *Joint Statistical Meetings*. American Statistical Association. Baltimore, MD. (*Rountable discussion with lunch*)
- Beckman, M. (2017). Pedagogical considerations for simulation-based inference in a large-enrollment introductory biostatistics course. *Joint Statistical Meetings*. American Statistical Association. Baltimore, MD.
- Beckman, M., Brown, E., Fry, E., Garfield, J., Sabbag, A., Ziegler, L. (2015). The Quest for Good Assessments for Research and Evaluation. *Joint Statistical Meetings*. American Statistical Association. Seattle, WA. (*authors alphabetical*)
- Beckman, M. (2015). Teaching for Transfer in the Statistics Classroom. *Twin Cities Stat Chat*. Saint Paul, MN.
- Beckman, M. (2015). Cognitive Transfer Outcomes for Introductory Statistics Students. *Colloquium Sponsored by Penn State Department of Statistics*. University Park, PA.
- Beckman, M. (2015). Cognitive Transfer Outcomes for Introductory Statistics Students. *Colloquium Sponsored by Cal Poly Department of Statistics*. San Luis Obispo, CA.
- Beckman, M., Keenan, T., (2013). Critique of the Johnson family of transformations to Normality. *Medtronic Statistics Conference*. Minneapolis, MN.
- Beckman, M. (2012). Design and analysis of experiments for pre-clinical research. *Medtronic Statistics Conference*. Minneapolis, MN.
- Beckman, M. (2008). Complaint trending for post-market surveillance. *6th Annual Product Complaints Congress for Life Sciences*. Center for Business Intelligence. Washington, D.C.
- Beckman, M. (2008). Statistical analysis for corrective & preventative action (CAPA) effectiveness. *6th Annual Product Complaints Congress for Life Sciences*. Center for Business Intelligence. Washington, D.C.

Workshops

- Post, J., Beckman, M. (2021). Teaching with R: Tidyverse, Markdown, and Shiny Basics. *US Conference on Teaching Statistics*. Consortium for the Advancement of Undergraduate Statistics Education. Virtual Conference (COVID-19). <https://www.causeweb.org/cause/uscots/uscots21/workshop/8> (*half-day workshop delivered in two parts*)

Posters

Note: student collaborators in **bold**; asterisk (*) indicates undergraduate

- **Hu, A.**, Hatfield, N., J., Beckman, M., D. (2024). Exploring How Novices and Experts Engage in Computational Thinking with Data. *Joint Statistical Meetings*. American Statistical Association. Portland, OR.
- **Hu, A.**, Hatfield, N., J., Beckman, M., D. (2024). Exploring How Novices and Experts Engage in Computational Thinking with Data. *Electronic Conference on Teaching Statistics*. Virtual.
- **Lloyd, S.**, Beckman, M., D. (2024). Feasibility Study for Developing and Validating an Instrument that Includes Interactions Among Learning Objectives Related to Confidence Intervals. *Electronic Conference on Teaching Statistics*. Virtual.
- **Lloyd, S.**, Beckman, M. (2023). Measuring Statistical Literacy Surrounding Confidence Intervals. *USCOTS Research Satellite*. University Park, PA.
- **Phadke, S.**, Beckman, M., Lock Morgan, K. (2023). Examining the Role of Context in Statistical Literacy Outcomes using an Isomorphic Assessment Instrument. *USCOTS Research Satellite*. University Park, PA.
- **Dragich*, E.**, Beckman, M., Çetinkaya-Rundel, M., Dogucu, M., Legacy, C., Tackett, M., Zieffler, A. (2023). Creating a standardized assessment to measure learning in introductory data science courses. *USCOTS Research Satellite*. University Park, PA.
- Le, L. & Beckman, M. (2023). Connecting and Supporting Statistics and Data Science Education Researchers Through the CAUSE Organization. *International Association for Statistics Education (IASE) Satellite Conference*. Toronto, Canada.
- **Lloyd, S. E.**, Beckman, M., Pearl, D., Passonneau, R., **Li, Z.**, & **Wang*, Z.** (2022). Foundations for NLP-Assisted Formative Assessment Feedback for Short-Answer Tasks in Large-Enrollment Classes. *Joint Statistical Meetings*. Washington, D. C.
- Beckman, M., & Le, L. (2022). CAUSE Research: Connecting statistics and data science education researchers. *Electronic Conference on Teaching Statistics*. Virtual.
- **Lloyd, S. E.**, Beckman, M., Pearl, D., Passonneau, R., **Li, Z.**, & **Wang*, Z.** (2022). Foundations for AI-Assisted Formative Assessment Feedback for Short-Answer Tasks in Large-Enrollment Classes. *Electronic Conference on Teaching Statistics*. Virtual.
- **Eisenhauer, E.**, Beckman, M., Hanks, E. (2022). Survey of Probability Attitudes. *Electronic Conference on Teaching Statistics*. Virtual.
- **Eisenhauer, E.** & Beckman, M. (2021). Survey of Attitudes toward Probability. *US Conference on Teaching Statistics*. Virtual (COVID-19). www.causeweb.org/cause/uscots/uscots21/th-06-survey-attitudes-toward-probability
- **Gong*, Y.**, Pearl, D., Beckman, M., Hatfield, N., & **Zhang*, S.** (2021). The value of Log files of students' interaction with software applications: Replicating a Bayesian Network analysis across multiple years data. *US Conference on Teaching Statistics*. Virtual (COVID-19). www.causeweb.org/cause/uscots/uscots21/program/posters
- **Hu, A.**, Beckman, M., & Pearl, D. (2021). Program Evaluation Through Alignment of Student Perceptions, Outcomes Assessment, and Faculty Perceptions in an Undergraduate Statistics Major. *US Conference on Teaching Statistics*. Virtual. www.causeweb.org/cause/uscots/uscots21/tu-01-program-evaluation-through-alignment-student-perceptions-outcomes-assessment
- McNamara, A., **Legacy, C.**, **Rao, V.**, delMas, R., Zieffler, A., Beckman, M., & **Basner Butler, E.** (2021). Computing in the Statistics Curriculum: Lessons Learned from the Educational Sciences.

US Conference on Teaching Statistics. Virtual (COVID-19). www.causeweb.org/cause/uscots/uscots21/tu-03-computing-statistics-curriculum-lessons-learned-educational-sciences

- **Zhang***, S., Pearl, D., Beckman, M., Hatfield, N., & **Gong***, Y. (2021). The value of Log files of students' interaction with software applications: Performance Evaluation in Correlation Guessing. *US Conference on Teaching Statistics*. Virtual (COVID-19). www.causeweb.org/cause/uscots/uscots21/program/posters
- **Yan***, W., Pearl, D., & Beckman, M. (2019). Assessing Student Conceptual Competencies using Bayesian Networks. *US Conference on Teaching Statistics*. University Park, PA.
- Wu, J., Lai, C., Beckman, M., Raike, R., Gupta, R., Abosch, A., & Nelson, D. (2013). Video-motion detection for objectively quantifying movements in patients with Parkinson's disease. *17th International Congress of Parkinson's Disease and Movement Disorders*. Movement Disorder Society. Sydney, Australia.
- Doe, B., Fontecchio, J., Beckman, M., Depre, J., Boulware, S., & Keenan, T. (2012). Visual management system for manufacturing yield SPC data. *Medtronic Science and Technology Conference*. Minneapolis, MN.
- Holland, M., & Beckman, M. (2011). Statistical methods for monitoring rare adverse events. *Neuromodulation Innovation Week*. Minneapolis, MN.

SPONSORED RESEARCH, FUNDING, ETC.

Principle Investigator

2025 - 2026

PSU Center for Socially Responsible Artificial Intelligence (CSRAI) Seed Grant

Award #025243

Title: Diversity Track: Comparative analysis of AI models and human judgments for evaluation of student writing with and without non-normative use of English language.

Budget: \$24,620

co-PIs: Rebecca Passonneau; ChanMin Kim; Dennis Pearl.

Subaward PI

2024 - 2027

NSF Mid-Career Advancement (Directorate for STEM Education)

NSF Award #2423026

Title: MCA: Cultivating a Leader in Statistics and Data Science Education through Strategic Partnerships

Subaward Budget: \$88,273

Primary Award PI: Jennifer Broatch (Arizona State University).

Primary Award Budget: \$331,452

Co-Investigator

2024 - 2026

NSF Improving Undergraduate STEM Education (IUSE: EDU)

NSF Award #2417294

Title: Fostering Engaged Team-Based Learning in Asynchronous Online and Hybrid Learning Environments

Budget: \$400,000

PI: Sy-Miin Chow (PSU Health & Human Development).

Principle Investigator

2023 - 2025

NSF Improving Undergraduate STEM Education (IUSE: EDU)

NSF Award #2236150

Title: Project CLASSIFIES (Common Language Assessment in Studying Statistics with Instructional Feedback and Increased Enrollment Scalability)

Budget: \$300,000

co-PIs: Dennis Pearl (Penn State University), Rebecca Passonneau (Penn State University).

Consultant / Independent Evaluator

2023 - 2027

NSF Improving Undergraduate STEM Education (IUSE: EDU)

NSF Award #2235355

Title: Expanding and assessing the art and practice of statistical thinking in post-secondary courses

Budget: \$800,000

PI: Nathan Tintle (Superior Statistical Research LLC) and co-PIs: Beth Chance (Cal Poly), Soma Roy (Cal Poly), Karen McGaughey (Cal Poly), and Todd Swanson (Hope College).

ASA Member Initiative Grant

2023

ASA Section on Statistics & Data Science Education

Title: Statistics and Data Science Education Research Center at Penn State

Budget: \$250

Faculty Travel Award

2025

Penn State Global Programs

Title: University of Auckland (NZ): Collaboration investigating AI assistance for instructors providing assessment feedback to students in large classes

Budget: \$2,500

ASA Member Initiative Grant

2022

ASA Section on Statistics & Data Science Education

Title: CAUSE Research Resource Page Development

Budget: \$1,000

Collaborators: Doug Whitaker (Mount Saint Vincent Univ.); Laura Le (Univ. of Minnesota)

Tombros Fellowship

2017 - 2018

Center of Excellence in Science Education (Penn State University)

Title: Comprehensive Assessment of Curricular Goals for the Undergraduate Statistics Major

Budget: \$20,279.45

Collaborators: Kirsten Eilertson (Penn State); Kari Lock Morgan (Penn State); Paul Roback (St Olaf College); Jennifer Kaplan (Univ. of Georgia); Beth Chance (Cal Poly); Allan Rossman (Cal Poly); Nick Horton (Amherst College)

Assessment Development Support

Spring 2013

Conducted interviews with expert reviewers in order to gather validity evidence during development of the MOST assessment as part of the CATALST Project (NSF DUE-0814433) headed by Joan Garfield (Univ. of Minnesota).

Consultant / Independent Evaluator

Spring 2011

Member of the evaluation team supervised by Joan Garfield for the Creating a Teaching and Learning Infrastructure for Introductory Statistics Redesign Project (NSF DUE-0737126) headed by Rob Gould (UCLA).

SERVICE TO PROFESSION

Consortium for Advancement of Undergraduate Statistics Education (CAUSE)

- Executive Director (2024 - present)

- co-Associate Director for Research (2021 - 2024)
- co-Chair of CAUSE Research Advisory Board (2021 - 2024)
- Organized CAUSE Research Satellite Conferences (2021; 2023)
- USCOTS Program Committee (2023)

American Statistical Association (ASA)

Section on Statistics and Data Science Education

- Executive-At-Large (elected; 2025-2027)

International Association for Statistics Education (IASE)

Education Section of International Statistical Institute (ISI)

- International liaison for catalog of all doctoral dissertations in statistics education (2022 - present)

Association for Computing Machinery (ACM)

Special Interest Group, Computer Science Education (SIGCSE)

- DataEd'23 Program Committee (2023)

National Science Foundation (NSF)

Directorate for STEM Education

- Panelist (January 2023)

International Examiner (PhD)

- Rachel Passmore (Statistics); University of Auckland (NZ); Graduation: 2024

Associate Editor

- Statistics Education Research Journal (2023 - present)

Journal Refereeing

- *Statistics Education Research Journal*
- *Technology Innovations in Statistics Education*
- *Journal of Statistics Education*
- *American Journal of Distance Education*
- *ZDM–International Journal of Mathematics Education*
- *The American Statistician*
- *Education Sciences*

SERVICE TO UNIVERSITY

Chair of Undergraduate Curricula (Department of Statistics)

née Director of Undergraduate Programs

- Faculty-in-charge for undergraduate statistics major & minor programs (2016 - 2024)
- Department contact for data sciences major–statistical modeling option (2018 - 2024)

Nittany Data Labs (Undergraduate data science club)

- Faculty Advisor (Fall 2017 - 2024)

Undergraduate Education Advisory Committee (Eberly College of Science)

- Representative for Department of Statistics (Spring 2016 - 2022)

Culture & Diversity Committee (Department of Statistics)

- ECoS Ombudsperson (Spring 2018 - 2021)
- Department committee member (Spring 2018 - 2021)

ASA DataFest at Penn State (Statistics/Data Science Competition)

- Faculty liaison to American Statistical Association
- Faculty liaison to corporate sponsors

Representative for Recruitment/Retention Events (Department of Statistics)

- Spend a Summer Day (Spring 2016 - 2021)
- For the Glory (Spring 2016 - 2021)
- Student Orientation (“NSO”; New, Transfer & International; Spring 2016 - 2021)
- Millenium Scholars Program (Spring 2016 - 2021)

PROFESSIONAL DEVELOPMENT

International Conference on Teaching Statistics (ICOTS)

International Association for Statistics Education

- 2022: Rosario, Argentina
- 2018: Kyoto, Japan

ACM International Computing Education Research (ICER) Conference

Association for Computing Machinery

- 2022: Lugano, Switzerland

Joint Statistical Meetings (JSM)

American Statistical Association

- 2023: Toronto, Canada
- 2020: Virtual (due to COVID-19)
- 2019: Denver, CO
- 2018: Vancouver, Canada
- 2017: Baltimore, MD
- 2015: Seattle, WA

United States Conference on Teaching Statistics (USCOTS)

Consortium for the Advancement of Undergraduate Statistics Education (CAUSE)

- 2023: University Park, PA
- 2021: Virtual (due to COVID-19)
- 2019: University Park, PA
- 2017: University Park, PA
- 2013: Raleigh-Durham, NC

CAUSE Research Satellite Conference (at USCOTS)

Consortium for the Advancement of Undergraduate Statistics Education (CAUSE)

- 2023: University Park, PA
- 2021: Virtual (due to COVID-19)

International Research Forum on Statistical Thinking, Reasoning, and Literacy (SRTL)

- 2023: Brisbane, Australia (SRTL-13)
- 2017: Rotorua, New Zealand (SRTL-10)

ICSA Symposium

International Chinese Statistics Association

- 2022: Gainesville, FL

Conference on Statistical Practice

American Statistical Association

- 2017: Jacksonville, FL

Computation and Visualization Consortium (CVC)

- 2016: Claremont, CA

Twin Cities Stat Chat

2009 - 2015

Macalester College, Saint Paul MN

- Regular attendee of monthly meetings among Statistics instructors and researchers representing a variety of colleges and Universities in the greater Twin Cities area. Content varied including research seminars, guest speakers, article discussion, teaching materials, etc.

Medtronic Statistics Conference

2009 - 2014

Medtronic World Headquarters, Minneapolis MN

- Attended presentations showcasing the work of other Medtronic Statisticians worldwide, as well as half-day and full-day professional development topics.
- *Enhancing Big Data Projects through Statistical Engineering* half-day seminar presented by Ronald D. Snee (Snee Associates, LLC). 2014.
- *Statistical Design of Sequential Clinical Trials in R* full-day seminar presented by Scott S. Emerson (University of Washington). 2013.
- *Variation in Decomposition* half-day seminar and *Regulatory Trends* half-day seminar presented by Wayne Taylor (Taylor Enterprises, Inc). 2013.
- *Propensity Score Matching* full-day seminar presented by Thomas E. Love (Case Western Reserve University). 2012.
- *Experiments for Robust Design* full-day seminar presented by Connie M. Borrer (Arizona State University). 2012.
- *Bayesian Adaptive Methods for Clinical Trials* full-day seminar presented by Bradley P. Carlin (University of Minnesota) and Andrew Mugglin (Paradigm Biostatistics, LLC). 2011.
- *Statistical Methods for Reliability Data* full-day seminar presented by William Q. Meeker (Iowa State University). 2010.
- *Statistical Process Control* full-day seminar by Wayne Taylor (Taylor Enterprises, Inc). 2009.

AWARDS & HONORS

**2025 New Zealand
Statistical Association**

NZSA Visiting Lecturer (speaking tour). “The New Zealand Statistical Association coordinates and provides some financial support for a tour of New Zealand universities by a distinguished overseas statistician.... Usually this person, known as the NZSA Visiting Lecturer, will spend two to three days at each of the six main university centres, and give at least two lectures at each place: one for a general audience, and one more closely tied to their own particular research interests.” (<https://www.stats.org.nz/nzsa-visiting-lecturers/>)

**2023 SRTL
Research Forum**

“Statistician-in-residence” at the 13th international research forum on statistical reasoning, thinking, and literacy (SRTL-13) in Maleny, Australia. This recognition included opening keynote presentation at SRTL-13 as well as travel support and accommodations for the event.

2017 Penn State

Tombros Fellowship. “The Martarano Leadership Fellows Program (formerly known as the Tombros Fellows Program) is intended to provide professional development opportunities for faculty in the Eberly College of Science.” (<https://science.psu.edu/offices-and-centers/cese/awards-and-fellows>)

2014 Nonin Medical

Nominated for *NONIN WINS* company-wide recognition award for outstanding contribution to publishable research with physician partners at the University of Minnesota.

2013 Medtronic

Presented with a long-term incentive award in 2013 designed to recognize and retain high-achieving employees.

2009 Medtronic

Presented with a long-term incentive award in 2009 designed to recognize and retain high-achieving employees.