

SWARTHMORE COLLEGE

CURRICULUM VITAE

Suzanne M. Thornton, PhD
Philadelphia, PA, 19139
Email: thornton.suzy@gmail.com

<https://dr-suz.github.io>

<https://independent.academia.edu/SuzanneThornton>

ORCID: 0000-0002-8221-3792

Education:

Graduate Education: **Ph.D.**, Statistics.

Thesis title: [Advanced computing methods for statistical inference](#)

Thesis advisor: Minge Xie

Rutgers, The State University of New Jersey; New Brunswick, NJ, 2014 - 2019

Undergraduate: **B.S.**, Statistics. *Summa Cum Laude*; Senior Thesis title:

[Geometric ergodicity of Gibbs sampler for a hierarchical random effects model: Re-explained.](#)

Thesis advisor: James Hobert.

University of Florida, Gainesville, FL, 2010 - 2014

B.S., Mathematics.

University of Florida, Gainesville, FL, 2010 - 2014

Professional Experience:

Assistant Professor, Mathematics and Statistics Department, Swarthmore College, Swarthmore, PA, 2020 – Present

Special government employee, U.S. Census Bureau National Advisory Committee on Racial, Ethnic, and Other Populations, 2022 – 2025

Facilitator, Strengthening Conceptual Understanding in Introductory Statistics Courses, DANA Center for Mathematics Pathways at University of Texas Austin, Remote, Summer 2021 & Summer 2022

Interdisciplinary faculty panelist, Engaged Scholarship across Divisions: Faculty Panels, Lang Center for Civic and Social Responsibility, Swarthmore, PA, March 2022

Interdisciplinary faculty participant, Environmental Studies (ENVS) Curriculum Workshop, Swarthmore College, remote due to COVID-19, January 2022

Visiting Assistant Professor, Mathematics and Statistics Department, Swarthmore College, Swarthmore PA, 2019 – 2020

Student Consultant, Office of Statistical Consulting, Rutgers University, New Brunswick, NJ, 2016 – 2019

Teaching Assistant, Statistics Department, Rutgers University, New Brunswick, NJ, 2014 – 2019

Teaching Assistant, Statistics Department, University of Florida, Gainesville, FL, 2013 – 2014

Publications:

Papers

Tractenberg R, LaLonde D, **Thornton S**. The Mastery Rubric for Statistics and Data Science: promoting coherence and consistency in data science education and training. 2023. *arXiv*: 2308.08004. (*pre-print*)

Thornton S, Li W, Xie M. (2023) Approximate confidence distribution computing. *The New England Journal of Statistics in Data Science*. (*in press*)

Choi H, Detyniecki K, Bazil C, **Thornton S**, Crosta P, Tolba H, Muneeb M, Hirsch LJ, Heinzen EL, Sen A, Depondt C, Perucca P, Heiman GA; EPIGEN Consortium. Development and validation of a predictive model of drug-resistant genetic generalized epilepsy. *Neurology*. 2020 Oct 13;95(15):e2150-e2160. doi: 10.1212/WNL.00000000000010597. Epub 2020 Aug 5. PMID: 32759205; PMCID: PMC7713754.

Michael H, **Thornton S**, Xie M, Tian L. Exact inference on the random-effects model for meta-analyses with few studies. *Biometrics*. 2019 Jun;75(2):485-493. doi: 10.1111/biom.12998. Epub 2019 Apr 13. PMID: 30430540; PMCID: PMC7045874.

Articles

Thornton S. (2022, June) Statistics Education and Reconsidering the Status Quo. *AMSTAT News: The JEDI Corner*. Issue #540, 20–21, https://www.academia.edu/81302006/Statistics_Education_and_Reconsidering_the_Status_Quo.

Thornton S, Roy D, Parry S, LaLonde D, Martinez W, Ellis R, Corliss D. (2022, Jan). Towards best practices for collecting gender and sex data. *Significance*, 19(1), 40–45. <https://doi.org/10.1111/1740-9713.01614>

Cook, SH, **Thornton S**, Robinson, SE, Cochran, J, Yung, G. Statistics for Equity: Capturing, Not Masking, Intersectional Dynamics in Data. (2021, Nov) *AMSTAT News: The JEDI Corner*. Issue #533, 14–15, <https://magazine.amstat.org/blog/2021/11/01/the-jedi-corner-statistics-for-equity-capturing-not-masking-intersectional-dynamics-in-data/>

LaLonde D, Martinez W, Miller J, Ott M, **Thornton S**. (2019, May) LGBT+ resources for statisticians and data scientists. *Significance* (online). https://www.academia.edu/81301435/LGBT_resources_for_statisticians_and_data_scientists

Thornton S, Green B, Benn E. (2019, May). Friends and allies: LGBT+ inclusion in statistics and data science. *Significance*, 16(3), 39–41. <https://doi.org/10.1111/j.1740-9713.2019.01280.x>

Books and Proceedings

Thornton S. and Tractenberg R.E. (2023) Ethical considerations for data involving human gender and sex variables. In *Ethics in Statistics: Opportunities and Challenges*. (editor: Hassan Doosti) Ethics International Press. (*in press*, formerly published in August 2022 in Proceedings of the Joint Statistical Meetings, p 390–414)

Tractenberg R.E. and **Thornton S.** (2023) Facilitating the integration of ethical reasoning into quantitative courses: Stakeholder analysis, ethical practice standards, and case studies. In *Ethics in Statistics: Opportunities and Challenges*. (editor: Hassan Doosti) Ethics International Press. (in press, formerly published in August 2022 in Proceedings of the Joint Statistical Meetings, p 1493–1519)

Thornton S. and Xie M. (2023) An exploration of parameter duality in statistical inference. In the Proceedings of the 2022 Philosophy of Science Association Symposium. (*accepted conditionally*)

Thornton S and Xie M. (2023+) Bridging Bayesian, frequentist and fiducial inferences using confidence distribution. In *Handbook on Bayesian, Fiducial and Frequentist (BFF) Inferences*. (co-editors: Berger JO, Meng XL, Reid N, & Xie M) Chapman & Hall, New York. (*in press*)

Media

Stats + Stories Podcast: Episode 247: Inclusive Data Collection. Sept 29, 2022

Taylor & Francis Celebrates Pride Month 2022. Twitter @tandfphysci. June 10, 2022

Practical Significance Podcast: Episode 6: American Statistical Association (ASA) Pride. May 28, 2021

Other Professional Activities:

Invited Lectures

A brief reflection on white supremacy in Statistics. Swarthmore College, Swarthmore, PA, November, 2020.

Statistical computing with confidence distributions. Villanova University, Villanova, PA, December, 2019.

Statistical computing with confidence distributions. Icahn School of Medicine at Mount Sinai, New York City, NY, April, 2019.

Introduction to Common Statistical Methods. Rutgers Center for Cell Biology and Neuroscience Weekly Seminar, Piscataway, NJ, 2016.

Abstracts for Conference Papers and Presentations (*organizer/co-organizer)

Asher J, Tractenberg R, **Thornton S.** (2023, August) Invited panel session on *Incorporating Social Justice and Ethics into the Undergraduate Curriculum*.* 2023 Joint Statistical Meetings, Session #1328. Toronto, Canada.

Thornton S. (2022, November) *Presentation* (individual slide deck). *Building Stewards in Mathematical Statistics*. For Panel at the 2023 Joint Statistical Meetings, Session #1328. Toronto, Canada.

Berger J, Glymour C, Mayo-Wilson C, **Thornton S**, Mayo D. (2022, November) Invited panelist in *Multiplicity, Data-Dredging, and Error Control*. The 28th Biennial Meeting of the Philosophy of Science Association, Session #DAJNQ4097. Pittsburgh, PA.

Thornton S. (2022, November) *Presentation* (individual slide deck). *The Duality of Parameters and the Duality of Probability*. For Panel at the 28th Biennial Meeting of the Philosophy of Science Association, Session #DAJNQ4097. Pittsburgh, PA.

Corliss D, Sinco BR, **Thornton S**, Warner, S, Asher JL. (2022, August) Data-Driven Ethics as Statistical Practice. Topic contributed panel, Joint Statistical Meetings, Abstract #322960, Session 59. Washington, D.C.

Thornton S. (2022, August) *Presentation* (individual slide deck). *Sex and gender: Data quality and ethical considerations for statistical analyses*. For Panel at Joint Statistical Meetings, Abstract #322960, Session 59. Washington, D.C.

Corliss D, Parker, D, Sharp J, Shilane D, **Thornton S.** (2021, February) Invited panelist in Ethics Panel: Data and Analytic Issues in the Age of COVID-19. Conference on Statistical Practice, Abstract #304217. Virtual (due to coronavirus pandemic).

Auerbach J, Cipolli W, Corliss D, Evans D, **Thornton S**, Tractenberg RE, Carver R. (2020, July) Invited panelist in Balderdash, codswallop, and malarkey: A panel. Joint Statistical Meetings, Abstract #309691, Session 551. Virtual (due to coronavirus pandemic).

Benn E, Green B, Martinez W, Miller J, Ott M, **Thornton S.** (2019, October) *Conference Within a Conference: A Forum for Sharing a Research and Education Agenda.** Women in Statistics and Data Science Conference, Abstract #306457. Bellevue, WA.

Martinez W and **Thornton S.** (2019, July) *Facilitator* for the first *LGBT Diversity Townhall.** Other Cmte/Business at Joint Statistical Meetings Abstract #218876. Denver, CO.

Gosh D, de Queiroz G, Hecht J, Martinez W, Ram K, **Thornton S**, Hicks S. (2019, August) Invited panelist in Changing the Statistics Community: Effective Strategies for Promoting an Inclusive and Equitable Culture for Women. Panel at Joint Statistical Meetings, Abstract #301726, Session 400. Denver, CO.

Benn E, Green B, **Thornton S.** (2018, October) *Preparing for Increased Gender Diversity and Inclusion in Statistics and Data Science: Important Perspectives from Gender Non-Conforming and LGBTQ Scholars*.* Women in Statistics and Data Science Conference, Abstract #304803. La Jolla, CA.

Thornton S, Li W, Xie M. (2017, June) *Presentation* (individual slide deck). *Approximate Confidence Distribution Computing: A likelihood-free method with statistical guarantees*. Invited speaker for session on Urging a paradigm change: New developments on statistical inferences. International Chinese Statistical Association Applied Statistics Symposium, Session 142. Chicago, IL.

Thornton S. (2017, September) *Presentation* (individual slide deck). *Approximate Confidence Distribution Computing*. Joint Conference of the Central European Network of the International Biometric Society and the International Society of Biopharmaceutical Statistics, Abstract #909-0003-00019. Vienna, Austria.

Thornton S, Xie M. (2017, June) *Presentation* (individual slide deck). *Approximate Confidence Distribution Computing*. Session on New developments in fusion learning and statistical inferences. First International Conference on Econometrics and Statistics, Abstract #0834, Session EO210. Hong Kong University of Science and Technology, Hong Kong.

Thornton S. (2016, December) *Presentation* (individual slide deck). *Approximate Confidence Distribution Computing (ACC)*. Invited speaker to Special Invited Session:BFF (Bayesian/frequentist/fiducial) Inferences in the New Era of Data Science, The 10th International Chinese Statistical Association Conference, Abstract #00776, Session 138. Shanghai, China.

Abstracts for Conference Posters (*corresponding author)

Thornton S and Tractenberg RE. (2022, November) *Stewardship and Stakeholders: Making ethical quantitative practice practical.** Philosophy of Science Symposium, Pittsburgh, PA.

Thornton S. (2017, October) *Approximate Confidence Distribution Computing: An effective likelihood-free method with statistical guarantees.** Women in Statistics and Data Science Conference, Abstract #303836, Speed Session 4. La Jolla, CA.

Thornton S and Xie M. (2017, April) *Approximate Confidence Distribution Computing: An effective likelihood-free method with statistical guarantees.** New England Statistics Symposium, Abstract #2190. Storrs, CT.

Thornton S and Xie M. (2017, July) Invited Poster, *Approximate Confidence Distribution Computing: An effective likelihood-free method with statistical guarantees.** Joint Statistical Meetings, Abstract #322649, Session 83, Baltimore, MD.

Thornton S and Xie M. (2016, December) Invited Poster, *Approximate confidence distribution computing (ACC): An effective likelihood-free computing method with statistical guarantees.** 72nd Annual Deming Conference on Applied Statistics, Atlantic City, NJ.

Thornton S and Xie M. (2016, September) *Approximate Confidence Distribution Computing.** Workshop on Higher-Order Asymptotics and Post-Selection Inference, St. Louis, MI.

Thornton S and Xie M. (2016, October) *Approximate Confidence Distribution (ACC) Computing Method.** Women in Statistics and Data Science Conference, Abstract #303234, Charlotte, NC.

Thornton S and Xie M. (2016, April) *Approximate Confidence Distribution Computing.** Fusion Learning & Bayesian, Frequentist, and Fiducial Inferences and Statistical Foundations Workshop, Piscataway, NJ.

Research Funding:

Submitted

Spencer Research Grant on Education	February 2023 – January 2025	\$216,896
<i>Education in Flux: Measuring the role of education in displacement decisions for families of school-age children in Syria</i>		

Dubai Cares and INEE E-Cubed Grant	August 2022 – July 2024	\$461,348
<i>Education in Flux: Measuring the role of education in displacement decisions for families of school-age children in Syria</i>		

Completed

Lang Center for Civic and Social Responsibility	Summer 2022	\$6300
<i>Faculty-led Engaged Research: Gender as a concept in data science</i>		
Lang Center for Civic and Social Responsibility	Summer 2021	\$4800
<i>Faculty-led Engaged Research: Designing an ethical statistics curriculum for all majors</i>		

Institutional Funding:

Swarthmore College	Faculty Research Support Grant	2020 – 2022	\$3000
Swarthmore College	Faculty Travel Fund	2021 – 2022	\$2687.50
Swarthmore College	NCFDD Faculty Success Program	Spring 2021	\$3950
Swarthmore College	Faculty Research Support Grant	2019 – 2020	\$1750
Rutgers University	Assistant Professional Development Fund	2018 – 2019	\$752
Rutgers University	Assistant Professional Development Fund	2017 – 2018	\$925
Rutgers University	Assistant Professional Development Fund	2016 – 2017	\$1082

Rutgers University	Conference Travel Support	Fall 2015	\$829.70
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Teaching:

Swarthmore College

Mathematical Statistics I (STAT061)	Fall 2022
Statistical Methods II (STAT021)	Spring 2022, Spring 2021, Fall 2020, Fall 2019
Statistical Methods I (STAT011)	Spring 2023, Fall 2021, Spring 2020

Rutgers University

Regression Analysis (STAT 463/563)	Fall 2017, Summer 2015
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University of Florida

Intro to Statistics I (STA 2023 - lab)	Spring 2014
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Mentoring: (*co-mentor)

Shikha Shrestha, Swarthmore College	Summer 2022
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Ms. Shrestha is a student Research Assistant whose work with me was sponsored by the Lang Center for Civic and Social Responsibility. The intended output of her engaged research on "Gender as a concept in data science" includes an undergraduate poster presentation at a 2023 conference (either Women in Statistics and Data Science or Conference on Statistical Practice - depending on travel funding).

Haron Mwangangi Kalii and Nancy Vu, Swarthmore College	2021 – 2022
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Mr. Kalii and Ms. Vu were quantitative Research Assistants working with me and Prof. Amy Kapit (Swarthmore, Peace & Conflict Studies) in our Education in Conflict Interdisciplinary Research Group with two other undergraduate qualitative Research Assistants. The output of this work included two grant applications to continue collaborative work with the Assistance Coordination Unit (international).

Nancy Vu, Swarthmore College	Summer 2021
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Ms. Vu was a student Research Assistant whose work with me was sponsored by the Lang Center for Civic and Social Responsibility. Her engaged research on "Designing an ethical statistics curriculum for all majors" resulted in a poster titled *Creating an Ethical Statistics Course from Scratch: A Student's Perspective* which she presented at the annual Sigma Xi (Swarthmore Chapter) Student Poster Presentation.

Xoe Porterfield, Swarthmore College	Summer 2019
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Mx. Porterfield independently studied statistical survey methodology for gender and sex minorities under my guidance.

Ryan Gross*, Rutgers University	Summer 2018
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Mr. Gross participated in the Rutgers Center for Discrete Mathematics & Theoretical Computer Science (DIMACS) REU where he studied approximate computing under advisement of Dr. Minge Xie and myself. He presented this work twice and published his work and results as publicly available material on the DIMACS website.

Service:

Department Level

Hiring Committee	2020 – 2021, 2021– 2022, 2022–2023
<i>Appointed to evaluate candidates for both tenure track and VAP positions</i>	
General Colloquium Coordinator	2021 – 2022
<i>Appointed to invite, plan, and manage schedules for colloquium speakers</i>	
Liberal Arts Collective (LACOL)	2021 – 2022
<i>Appointed faculty representative</i>	
Swarthmore Statisticians' Coffee Hour	Spring 2021
<i>Organizer and host of virtual discussions</i>	
Gender Minorities in Math/Stats Student Group	2020 – 2021
<i>Appointed faculty liaison</i>	
Math/Stat Placement Committee	Summer 2020
<i>Appointed statistics course placement consultant</i>	

College Level

Sanctuary Committee, Swarthmore College	2021 – Present
<i>Selected faculty member</i>	
Students' Disability Service Committee, Swarthmore College	2021 – Present
<i>Selected faculty member</i>	
Graduate Student Association, Rutgers University	2017 – 2018
<i>Elected vice president</i>	
University Senate, Rutgers University	2016 – 2017
<i>Elected graduate student representative to the University (Faculty) Senate</i>	

National Level

Volunteer for the Peaty Greene Program	Present
<i>Math tutor with an emphasis in GRE prep.</i>	
ASA Education Council	2020 – 2023
<i>Appointed Isolated Statisticians (ISOSTAT) representative.</i>	
ASA LGBTQ+ Advocacy Committee	2019 – 2023
<i>Chair elect and selected advisor for the Pride Fellowship.</i>	
Justice, Equity, Diversity, and Inclusion (JEDI) Organizing Group	2021 – 2022
<i>Appointed Chair of the Communications Committee.</i>	
JEDI Organizing Group	2020 – 2021
<i>Selected member of the Organizing Committee</i>	
Quantitative Study of Inclusion, Diversity, and Equity	Fall 2021
<i>Volunteer faculty participant for the inaugural Datathon4Justice</i>	
Undergraduate Statistics Project Competition	Spring 2020
<i>Volunteer Undergraduate Statistics Research Project Judge</i>	

ASA Presidential Appointee 2020
Chair of LGBTQ+ Inclusion Working Group

International Level

Reviewer for *The American Statistician* 2022
International Mathematical Statistics Association Watercooler Chat 2021
Selected representative to provide feedback on engaging young professionals.
Reviewer for *Synthese* 2021
Reviewer for the *Journal of the American Statistical Association* 2019

Honors and Awards:

International Chinese Statistical Association Student Paper Award for the paper entitled *Approximate confidence distribution computing: an effective likelihood-free method with statistical guarantees*. June 14, 2018

The 31st New England Statistics Symposium IBM Watson Research Center Student Research Award, April 21–22, 2017

In honor of outstanding research in the field of Statistics and Probability presented at the 31st New England Statistics Symposium at the University of Connecticut, Storrs, CT.

Deming Scholar Award 2016

Award presented at the 72nd annual Deming Conference on Applied Statistics to foster and recognize a select number of outstanding graduate students who are helping their statistics/biostatistics department.

Rutgers Presidential Fellowship 2015 – 2019

Presidential Fellowships are awarded to the most highly qualified candidates admitted to the Rutgers Graduate School.

Rutgers Excellence Fellowship 2014 – 2015

Fellowships offered only to a limited number of students at Rutgers, who demonstrate outstanding qualifications.

Professional Society Memberships:

Institute for the Quantitative Study of Inclusion, Diversity, and Equity

International Mathematical Statistics Association

American Statistical Association (ASA)

Communications Committee for the ASA's Justice, Equity, Diversity, and Inclusion Outreach Group

ASA LGBTQ+ Advocacy Committee Member