ANNA L. SMITH

UNIVERSITY OF KENTUCKY

CONTACT INFORMATION

Dr. Bing Zhang Department of Statistics
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ACADEMIC POSITIONS

July 2019 – present
Assistant Professor
Dr. Bing Zhang Department of Statistics at **University of Kentucky**

June 2017 – June 2019
Postdoctoral Research Scientist
Department of Statistics at **Columbia University**
Advised by Prof. Tian Zheng

EDUCATION

May 2017
PhD Statistics, The Ohio State University
Dissertation: Statistical Methodology for Network Comparison
Committee: Catherine A. Calder (advisor)
    Christopher R. Browning (Sociology)
    Eloise Kaizar
    Sebastian Kurtek
    David Sivakoff (joint with Mathematics)

May 2014
MS Statistics, The Ohio State University

May 2011
BS Computational Mathematics, Marquette University
Summa Cum Laude, Honors Program
Minor in Anthropology

RESEARCH INTERESTS

network modeling · Bayesian model checking · latent variable models · predictive assessment
reproducible modeling of behavioral data · hidden populations · data visualization

PUBLICATIONS

Delcher, C., **Smith, A. L.**, Romanelli, F., Gaskill, L., and Surratt, H. (2024) "Oxymorphone and oxycodone pharmacy purchases in U.S. counties: Prelude to the largest rural Human Immunodeficiency Virus outbreak in U.S. history". *Pharmacoepidemiology and Drug Safety*, 3:12, e70066.

Harris, D. R., Quesinberry, D., Anthony, N., Bae, J., **Smith, A. L.**, Delcher, C. (2024) "Housing instability increases for stimulant-involved overdose deaths after linking surveillance data to electronic health records in Kentucky." *Drug and Alcohol Dependence*, 264:112455.

Gilmore, G. R., **Smith, A. L.**, Dickinson, F. B., Crosswell, A. D., Mendes, W. B., & Whitehurst, L. N. (2024) "Sleep/wake regularity influences how stress shapes executive function." *Frontiers in Sleep* 3, 1359723.

Broderick, T., Gelman A., Meager, R., **Smith, A.**, and Zheng, T. (2023), "Toward a taxonomy of trust for probabilistic machine learning." *Science Advances* 9:7.

Smith, A., Zheng, T., and Gelman, A. (2023), "Prediction scoring of data-driven discoveries for reproducible research," *Statistics and Computing*, 33:1, 1-21.

Ward, O., Wu, J., Zheng, T., **Smith, A. L.**, and Curley, J. (2022), "Network Hawkes process models for exploring latent hierarchy in social animal interactions," *Journal of the Royal Statistical Society: Series C,* 71:5, 1402-1426.

Wu, J., **Smith, A. L.**, and Zheng, T. (2021), "Diagnostics and visualization of point process models for event times on a social network," *Applied Modeling Techniques and Data Analysis 1,* edited by Dimotilakis, Y., Karagrigoriou, A., Parpoula, Ch. and Skiadas, Ch. iSTE, Wiley, 7, 129-145.

> This manuscript also appears in conference proceedings: *18th Applied Stochastic Models and Data Analysis International Conference with Demographics Workshop, Florence, Italy, 11-14 June 2019,* 837-850.

Smith, A. L., Asta, D. M., and Calder, C. A. (2019), "The geometry of continuous latent space models for network data," *Statistical Science*, 34:3, 428-453.

Browning, C. R., Calder, C. A., Boettner, B., and **Smith, A.** (2017), "Ecological networks and urban crime: The structure of shared routine activity locations and neighborhood-level informal control capacity," *Criminology*, 55, 754-778.

Browning, C. R., Calder, C. A., Krivo, L. J., **Smith, A. L.**, and Boettner, B. (2017), "Socioeconomic segregation of activity spaces in urban neighborhoods: Does shared residence mean shared routines?" *RSF: The Russel Sage Foundation Journal of the Social Sciences*, 3:2, 210-231.

Browning, C. R., Calder, C. A., Ford, J. L., Boettner, B., **Smith, A. L.** and Haynie, D. (2017), "Understanding racial differences in exposure to violent areas: Integrating survey, smartphone, and administrative data resources," *The ANNALS of the American Academy of Political and Social Science,* 669, 41-62.

Smith, A., Calder, C. A., and Browning, C. R. (2016), "Empirical reference distributions for networks of different size," *Social Networks*, 47, 24-37.

MANUSCRIPTS UNDER REVIEW

Silva-Jones, J. R., **Smith, A. L.**, Marshburn, C., Crosswell, A., Mendes, W. B. and Whitehurst, L. N. "Contextualizing cognition: Socio-environmental factors shape how momentary stress predicts memory." (Revised and resubmitted in June 2025 to *Social Science & Medicine*)

Ward, Owen, **Smith, A. L.**, Zheng, T. "Bayesian modeling for aggregated relational data: a unified perspective". http://arxiv.org/abs/2506.21353 (Revised and resubmitted in June 2025 to a special issue of *Social Networks*.)

MANUSCRIPTS IN PREPARATION

Smith, A. L., Asta, D., and Calder, C. "Bayesian model checking for network curvature via posterior spectra."

<u>Wang, J.</u> and **Smith, A. L.** "Geometric model selection for latent space network models: Hypothesis testing via multidimensional scaling and resampling techniques"

<u>Wang, T.</u>, **Smith, A. L.**, Whitehurst, L. "Beyond the mean: Sequence analysis methods for clustering ordinal EMA data"

Smalls, B., Khanal, S., Adegboyega, A., **Smith, A. L.** "Assessing the influence of social networks on health behaviors of older adults living with Type 2 Diabetes"

Surratt, H., McLaurin, K., **Smith, A. L.**, <u>Wang, J.</u>, Burton, A., Delcher, C., Heimer, R., Walsh, S., Slavova, S., Gulley, J., Fraley, L., Sisco, E. "A snapshot of injecting drug consumption from the analysis of used syringes from Kentucky syringe exchange programs"

<u>Wang, T.</u>, **Smith, A. L.**, Whitehurst, L. "Bayesian latent growth curve models for EMA studies with Likert-scale responses"

Smith, A. L., Delcher, C., and Anthony, N. "A feasible solution algorithm for sparse clinical notes data"

Vogel, B., <u>Wang, J.</u>, Ward, O., **Smith, A. L.**, Laga, I. "Scalable model comparison and variable selection for ARD models."

Vogel, B., <u>Wang, J.</u>, Ward, O., **Smith, A. L.**, Laga, I. "The ARD and NSUM software package: model fitting, diagnostics, and variable selection tools."

<u>Wang, J.</u>, B. Vogel, Ward, O., Laga, I., **Smith, A. L.** "Differentiating Bayesian ARD models via posterior predictive null distributions."

Yang, S. W., Jungwon, A., **Smith, A. L.**, Labianca, J. "Networking and affect."

TALKS AND SEMINARS

(**Invited**) The Western North American Region of the International Biometric Society. Whistler, BC. Jun 15 - 18, 2025.
Bayesian latent class growth curve modelling for ecological momentary assessment data

(**Invited**) Joint Statistical Meetings. Toronto, Ontario. Aug 5 - 10, 2023.
Detecting deviations from flat latent geometry in network data

(**Invited**) International Chinese Statistical Association: Applied Statistics Symposium. Ann Arbor, MI. June 11-14, 2023.
Examining latent geometry assumptions in network data

(**Invited**) CMStatistics. Virtual. Dec 19 – 21, 2020.
Posterior predictive differences for comparing multiple networks

(Topic-Contributed) Joint Statistical Meetings. Virtual. Aug 2 – 6, 2020.
Posterior predictive distributions in network inference.

(**Invited**) Statistical Learning and Data Science Conference. Irvine, CA. May 27 – 29, 2020.
Better data science for better science. [Cancelled due to COVID-19]

(**Invited**) Department of Biostatistics, *University of Louisville*. Louisville, KY. Oct. 11, 2019.
Predictive inference for preregistered studies.

New Researchers Conference, *Colorado State University*. Fort Collins, CO. Jul 24 – 27, 2019.
A geometric perspective on latent network methods (poster).

(**Invited**) RAND Corp. Statistics Group. Pittsburgh, PA. Feb. 21, 2019.
A geometric perspective on latent network methods.

(**Invited**) Department of Statistics, *University of Kentucky*. Lexington, KY. Feb. 15, 2019.
A geometric perspective on latent network methods.

Joint Statistical Meetings. Baltimore, MD. Jul 29 – Aug 3, 2017.
A hierarchical model for network data in a latent hyperbolic space.

(**Invited**) Department of Mathematics, Statistics, and Computer Science, *Marquette University*.
Milwaukee, WI. Apr. 18, 2016.
Network comparison methods: Reference distributions for networks of different sizes.

(**Invited**) Joint Statistical Meetings. Chicago, IL. Jul 30 – Aug 4, 2016.
Geometric methods for network comparison and multilevel modeling (e-poster);
(Contributed) Empirical reference distributions for networks of different size.

Joint Statistical Meetings. Seattle, WA. Aug 8 – 13, 2015.
Comparing networks of different sizes: An extension of the HERGM (poster).

Sunbelt. *International Network for Social Network Analysis*. Brighton, UK. Jun 23 – 25, 2015.
Network comparison methods: Reference distributions for networks of different sizes.

CO-AUTHOR TALKS AND SEMINARS

Translational Science. *Association for Clinical and Translational Science.* Washington, DC. Apr. 14-17, 2025. Piloting a novel community-engaged bloodborne infection and drug supply surveillance system to improve harm reduction services for people who inject drugs in Kentucky (H. Surratt, et al.)

Substance Use Research Event. University of Kentucky. *Substance Use Research Priority Area.* Lexington, KY. Feb. 5, 2025.
    Opioid pharmacy transactions in Scott county, Indiana preceding the largest rural HIV outbreak in U.S. history (C. Delcher, et al.)
    Improving harm reduction services for people who inject drugs in Kentucky via a clinical and translational science collaboration (H. Surratt, et al.)

Sunbelt. *International Network for Social Network Analysis.* Edinburgh, Scotland. Jun. 24 - 30, 2024. Initial encounters and follow-up behavior at organizational networking events: The role of affect towards networking (S. W. Yang, et al.)

Annual Scientific Meeting. *American Psychosomatic Society.* Brighton, UK. Mar. 20 – 23, 2024. Perceived stress and emotion regulation predict daily health indicators (poster; E. Gloger, et al.)

* Joint Statistical Meetings. Toronto, Ontario. Aug 5 - 10, 2023. Clustered ratings profiles for ecological momentary assessment data (<u>T. Wang</u>, et al.)

Annual Meeting. *Academy of Management.* Boston, MA. Aug 4 - 8, 2023. Initial encounters and follow-up behavior at organizational networking events (S. W. Yang, et al.)

Annual Convention. *Society for Personality and Social Psychology.* Atlanta, GA. Feb. 23 – 25, 2023. Stress intensity and prior sleep loss predicts memory performance in Black American adults (J. Silva-Jones, et al.)

SLEEP. *Associated Professional Sleep Societies.* Charlotte, NC. Jun. 4 - 8, 2022. The impact of sleep, stress, and environmental context on memory pre- and during the COVID-19 pandemic in the United States (poster; J. Silva-Jones, et al.)

Annual Convention. *Society for Personality and Social Psychology.* San Francisco, CA. Feb. 16 - 19, 2022. The role of stress on memory performance in a geographically diverse sample (poster; J. Silva-Jones, et al.)

CMStatistics. Virtual. Dec 19 – 21, 2020. Network Hawkes process models for exploring latent hierarchy in social animal interactions (Owen Ward, et al.).

PI FUNDING 2025-2026. *High risk connections: Large scale social network modeling of opioid and benzodiazepine coprescriptions in Kentucky.* PI **A. L. Smith.**
University of Kentucky; Substance Use Research Priority Area (SUPRA) (Role: primary investigator, one month summer salary. Total award: $48,500).

CO-I FUNDING 2025-2026. *Investigating indoor air pollution's impact on adolescent sleep in Appalachian Kentucky.* PI T. Lu
National Institute of Environmental Health Sciences (NIEHS) via University of Kentucky Center for Appalachian Research in Environmental Sciences (UK CARES) (Role: co-investigator, 1.5% effort. Total award: $29,996).

2025. *Statistical methodology for model checking for aggregated relational data.* PI O. Ward
Pacific Institute for the Mathematical Sciences (PIMS) and the Banff International Research Station (BIRS) (Total award: travel, lodging, and meals for two-week residence at the University of British Columbia, Okanagan).

2024. *Pioneering a novel approach to HIV and bloodborne infection surveillance in high risk populations.* PI H. Surratt
University of Kentucky; Center for Clinical and Translational Science (CCTS) (Role: co-investigator. Total award: $45,788).

2023 – 2024[1]. *STIMuLINK.* PI C. Delcher
National Center for Injury Prevention and Control (Role: co-investigator, 10% effort. Total award: $1,087,500).

2022 – 2023. *The impact of daily stress exposure on EEG-derived sleep in mid-life.* PI L. Whitehurst
University of Kentucky; United in True Racial Equity (UNITE) (Role: co-investigator. Total award: $49,996).

CO-I FUNDING UNDER REVIEW 2026 – 2031. *Quantifying the impact of socioenvironmental and sleep factors on cognitive resilience in Black Americans.* PI L. Whitehurst
National Institute on Aging (NIA) (Role: co-investigator, 10% effort. Total budget: $3,582,386)
Impact score: 30 (9th percentile) (resubmitted: May 2025)

2026 – 2031. *Capture recapture for county level opioid use disorder in the United States.* PI C. Delcher
National Institute on Drug Abuse (NIDA) (Role: co-investigator, 25% effort. Total budget: $2,696,909)
Impact score: 38 (resubmitting: July 2025)

TEACHING Au 2019 - 2025   **Lead Instructor.** STA 605, *University of Kentucky*
Graduate-level required course in computational inference for 10-15 first-year graduate students.

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[1] Funding for the full program began in 2021

Sp 2022, 2023	**Lead Instructor.** STA 630, *University of Kentucky* Graduate-level elective course on introductory Bayesian modeling.
Sp 2023, 2025	**Lead Instructor.** STA 654, *University of Kentucky* Graduate-level elective course on applied Bayesian methods for the online M.A.S. degree.
Sp 2025	**Lead Instructor.** STA 525, *University of Kentucky* Introductory mathematical statistics course for 15-25 undergraduate students.
Sp 2019 - 2020, Sp 2022	**Lead Instructor.** STA 381, *University of Kentucky* Online intermediate statistics for 150-200 undergraduate students with majors in engineering.
Au 2012, Sp 2013 Au 2013, Sp 2014	**Lecturer**; **Teaching Assistant.** STAT 1350, *The Ohio State University* Prepared and presented weekly lecture materials and problem solving sessions for 100-200 students in an introductory undergraduate statistics course for non-science majors; instructed weekly lab sessions for groups of 25-30 students.
Summer 2013	**Teaching Assistant.** STAT 1450, *The Ohio State University* Instructed weekly lab sessions for groups of 25-30 students in an introductory undergraduate statistics course for students with some math background.

PRIMARY ADVISING

MASTERS COMMITTEE MEMBER
  Tianyi Wang, December 2023 *(tentative PhD Defense: Dec. 2025)*
  Jieyun Wang, December 2024 *(tentative PhD Defense: May 2026)*

ADDITIONAL ADVISING

MASTERS COMMITTEE MEMBER
  Shouyi Liang, April 2025
  Tori Stanton, April 2024
  Lee Park, April 2023
  Jiyeon Park, April 2023
  Jillian Silva-Jones (Psychology), December 2022
  Abelline Fionah (Chemistry), October 2022
  Jordan Sawdy (Mathematics), July 2022
  Yafan Guo, November 2021
  Gregory Hawk, April 2021

DISSERTATION COMMITTEE MEMBER
  Leiyue Li, May 2024
  Abelline Fionah (Chemistry), April 2024
  Jiyeon Park, April 2024
  Lee Park, January 2024
  Dongying Zhan, November 2023
  Yafan Guo, April 2023
  Gregory Hawk, April 2022

OUTSIDE EXAMINER
  Allison Fitisone (Mathematics), April 2024

* Student advisees are underlined

MASTERS OF APPLIED STATISTICS: CAPSTONE EXAMINATION
Lindsay Simon, April 2023
Stevie Roszkowski, April 2023

SERVICE   COMMITTEE MEMBERSHIPS
2020 – 2023   Elected Steering Committee Member (Natural Sciences representative). **Cooperative for the Humanities and Social Sciences (CHSS)**. University of Kentucky.

Department of Statistics
2019 – present   **Undergraduate Studies**.
2019 – present   **MS Methods Exam.**
                        Chair: Spring 2020, 2022 – 2025
2024   **Recruiting.**

CONFERENCE ORGANIZING
Session chair. Joint Statistical Meetings. Virtual. Aug 2 – Aug 6, 2020.

Session chair and local committee member. Statistical Learning and Data Science / Nonparametric Statistics. New York, NY. Jun 4 – 6, 2018.

Session chair. Joint Statistical Meetings. Baltimore, MD. Jul 29 – Aug 3, 2017.

Local committee member. ENVR/EnviBayes Workshop on Bayesian Environmetrics. Columbus, OH. Mar 31 – Apr 2, 2016.

JOURNAL REVIEWING
Biometrical Journal, 2025
Injury Epidemiology, 2025
Journal of the Royal Statistical Society, 2024, 2023
Criminology, 2024, 2019
Studies in Educational Evaluation, 2023
Journal of Nonparametric Statistics, 2020
Machine Learning, 2020
Annals of Applied Statistics, 2018
Bayesian Analysis, 2018
Journal of Statistics Education, 2014

AWARDS   TRAVEL AWARD. *Women in Statistics Conference*. 2018.
Awarded to early career researchers to help fund travel to the conference.

WHITNEY AWARD. *The Ohio State University*, Department of Statistics. 2017.
Awarded annually to the top post-candidacy students for excellence in statistical research.

OUTSTANDING RESEARCH ASSISTANT. *The Ohio State University*, Department of Statistics. 2015.
Awarded annually to graduate student research assistants in the department.

KOCH TRAVEL AWARD. *The Ohio State University*, Department of Statistics. 2015, 2016.
Awarded to graduate students in the department for conference travel.

UNIVERSITY FELLOWSHIP. *The Ohio State University*, Graduate School. 2011-2012.
Awarded to top incoming graduate students; waives teaching responsibilities for one academic year.

UNDERGRADUATE MATHEMATICS AWARD. *Marquette University.* 2011.
Awarded annually to one graduating student for outstanding performance in the study of mathematics.

OUTSTANDING UNDERGRADUATE PAPER. Who counts? Math across the curriculum for global learning. 2009.

ADDITIONAL RESEARCH EXPERIENCE	May 2014 – May 2017	**Graduate Research Assistant** *Institute for Population Research* at *The Ohio State University* Advised by Prof. Catherine A. Calder, Prof. Christopher R. Browning (Sociology), and Bethany Boettner
	Summer 2009, 2010	**Undergraduate Student Researcher** RESEARCH EXPERIENCE FOR UNDERGRADUATES *Department of Mathematics, Statistics, and Computer Science* at *Marquette University*
	2010	Risk Modeling for Pyroclastic Volcano Flows. Advised by Prof. Elaine Spiller.
	2009	Foot and Mouth Disease: Analysis for Establishing Testing Sites at Wisconsin Dairy Farms. Advised by Prof. Kim Factor.

ADDITIONAL TRAINING

University of Kentucky
Privacy and IT Security. Aug. 30, 2024
Regular and Substantive Interaction and Academic Engagement Training. Aug. 28, 2024
UKHC Compliance, HIPAA, and IT Security for New Employees. Nov. 3, 2023
UK Intellectual Property (IP) Policy. Nov. 3, 2023

CITI
Responsible Conduct of Research. Aug. 24, 2023 (virtual); Nov. 28, 2024 (in-person)
Good Clinical Practices – Social and Behavioral Research. Nov. 6, 2023
Human Subject Research Biomedical Investigators. Nov. 6, 2023

External conferences and training
Women in Statistics Conference. Cincinnati, Ohio. Oct. 18 – 20, 2018

Short Course on Dynamic Space-Time Modeling. ENVR/EnviBayes Workshop on Bayesian Environmetrics. Columbus, Ohio. Mar. 31, 2016

Summer School on Computer Models and Geophysical Risk Analysis. Vancouver, Canada. Aug 8 – 10, 2010