Adam Hall

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Education

University of Michigan, Ann Arbor 2019
PhD in Statistics
Recipient of the Rackham Merit Fellowship

University of California, Irvine 2011
Bachelor of Arts in Quantitative Economics
Bachelor of Arts in Sociology (Honors)
Minors in Mathematics, Statistics, and Philosophy
Member of Phi Beta Kappa

Employment

Research Mathematical Statistician - *US Census Bureau* Nov 2021 — Present

- Develops statistical models to improve the estimation of quantities necessary to implement Section 203 of the Voting Rights Act.
- Writes R and Python code for experimental visualizations to better communicate uncertainty in the ranking of American Community Survey estimates.
- Researches the use of novel generalizations of the maximum ratio to evaluate competing estimates of the same unknown parameter. Applies this research to population estimates produced by the Census Bureau's Continuous Count Study.
- Writes code in R, Python, and SQL to import, clean, and aggregate the data necessary to fit statistical models, and to evaluate the quality of their fit. Converts SAS code used in previous production processes into more readable, modern, and performant programs written in open source languages in accordance with the Census Bureau's modernization plans.
- Research utilizes knowledge and skills from statistical theory and methodology, survey methodology, statistical computing, computer science, economics, demography and social and behavioral sciences.

Research Mathematical Statistician (Postdoc) - *US Census Bureau* Aug 2020 — Nov 2021

- Performed research extending my doctoral studies of spatial price indices and their estimation using data from sample surveys and large administrative databases.
- Evaluated publications documenting evidence of potential economic data leaks to financial markets, and presented findings to Bureau leadership.
- Developed backend code to facilitate data visualizations comparing American Community Survey estimates between states.
- Wrote scripts to assist data users with importing the 2020 P.L. 94-171 Redistricting Data Summary Files into R. These scripts are currently available on census.gov.
- Wrote R and Stan code to assist researchers in implementing Section 203 of the Voting Rights Act by evaluating models for the prevalence of language minority groups in small areas.
- Performed research related to the planning, collection, processing, analysis, and dissemination of data applicable to censuses, large scale sample surveys, and other data sources (e.g. administrative data).

Statistical Consultant - *CSCAR at the University of Michigan* May 2018 — May 2019

- Provided technical expertise to assist graduate students and faculty in resolving research-related statistical questions.
- Assisted with tasks such as designing studies, specifying regression models, testing hypotheses, conducting power analyses, and modeling dependent data.
- Assisted clients with using statistical software such as SPSS, R, and Python to analyze, visualize, and interpret results.

Graduate Student Instructor - *University of Michigan* Aug 2013 — Sep 2019

- Taught labs for undergraduate statistics courses, including the use of software such as R and SPSS
- Graded exams and homework assignments, wrote questions for quizzes, and answered student questions during office hours and via email
- Helped students design survey samples for class projects and analyze the resulting data

Economist Student Trainee - *Bureau of Economic Analysis* Jun 2015 — Aug 2015

- Researched the process by which regional price parities (RPPs) are estimated from raw price quotes underlying the Consumer Price Index (CPI), expenditure estimates from the Consumer Expenditure Survey (CES), and other data from the American Community Survey (ACS).
- Wrote press releases to communicate economic findings to the public, reviewed economic data before release, and used SAS to produce supplementary tables upon public request.
- Used statistical packages such as SAS and R with survey data from the ACS Public Use Microdata Sample to estimate rents at the county level using appropriate econometric techniques, and compared these to estimates obtained using the full microdata.

Publications

- **Hall, A. C.**, and Kang, J. Inference with Pólya-Gamma Augmentation for US Election Law. (2025) *Mathematics.* `https://doi.org/10.3390/math13060945`.
- **Hall, A. C.**. Interpreting and Extending the Maximum Ratio Test of Unacceptability. (2024) Joint Statistical Meetings (JSM), Portland. `https://doi.org/10.5281/zenodo.13935802`.
- **Hall, A. C.**. Interpreting and Extending the Maximum Ratio Test of Unacceptability. (2024) *U.S. Census Bureau. Center for Statistical Research & Methodology Research Report Series, #2024-07*. `https://www2.census.gov/library/working-papers/2024/adrm/RRS2024-07.pdf`.
- Slud, E., Franco, C., and **Hall, A. C.**. Small area estimates for Voting Rights Act Section 203(b) coverage determinations. (2024) *Calcutta Statistical Association Bulletin.*
- Slud, E., Franco, C., **Hall, A. C.** and Kang, J. Statistical Methodology (2021) for Voting Rights Act, Section 203 Determinations. (2022). *U.S. Census Bureau. Center for Statistical Research & Methodology Research Report Series, #2022-06*. `https://www.census.gov/content/dam/Census/library/working-papers/2022/adrm/RRS2022-06.pdf`.

Dissertation

Unified Price Indices for Spatial Comparisons
University of Michigan, September 2019
Roderick Little and Matthew Shapiro, Co-Chairs
Developed and implemented a method to estimate spatial price indices at low levels of aggregation, such as US counties, using Nielsen's retail scanner data.

Selected Presentations

- Interpreting and Extending the Maximum Ratio Test of Unacceptability. *Joint Statistical Meetings (JSM)*. Portland, Oregon. August 2024.
- Bayesian Multinomial Logit Model for the Voting Rights Act, Section 203. *2024 International Society for Bayesian Analysis (ISBA) World Meeting*. Venice, Italy. July 2024.

Skills

Computer Languages	R, Python, SQL, SPSS, SAS, HTML, CSS
Operating Systems	Microsoft Windows, Mac OS X, GNU/Linux