

Jing Cao, PhD

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Education

2005 PhD, Statistics, University of Missouri at Columbia, Columbia, MO

Work Experience

2021–present: Professor of Statistical Science, Southern Methodist University
2011–2021: Associate Professor of Statistical Science, Southern Methodist University
2005–2011: Assistant Professor of Statistical Science, Southern Methodist University

Research Interests

- Clinical trial design and analysis
- Bayesian methods and applications
- High-throughput data analysis
- Latent variable modeling
- Machine learning and text mining

Refereed Publications

1. **Cao J, He C (2005)**. Bias adjustment in Bayesian estimation of bird nest age-specific survival rates. *Biometrics*, **61**, 877–878.
2. **Cao J, Stokes SL (2008)**. Bayesian IRT guessing models for partial guessing behaviors. *Psychometrika* **73**, 209–230.
3. **Cao J, He C, McCoy T (2008)**. Bayesian estimation of age-specific bird nest survival rates with categorical covariates. *Environmental & Ecological Statistics*, **15**, 49–58.
4. **Cao J, Xie X, Zhang S, Whitehurst A, White, M (2009)**. Bayesian optimal discovery procedure for simultaneous significance testing. *BMC Bioinformatics*, **10**:5.
5. Zhang S, **Cao J (2009)**. A close examination of double filtering with fold change and *t* test in microarray analysis. *BMC Bioinformatics*, **10**:402. (Highlighted paper)
6. Livingston EH, Elliot AC, Hynan LS, **Cao, J. (2009)**. Effect size estimation: Necessary component of statistical analysis. *Archives of Surgery*, **144**, 706–712.
7. **Cao J, Lee JJ, Albert S (2009)**. Comparison of Bayesian sample size determination criteria: ACC, ALC, and WOC. *Journal of Statistical Planning & Inference*, **139**, 4111–4122.

8. **Cao J**, He C, Suedkamp Wells KM, Millspaugh JJ, Ryan MR (2009). Modeling age and nest-specific survival using a hierarchical Bayesian approach. *Biometrics*, **65**, 1052–1062.
9. Zhang S, **Cao J**, Kong M, Scheuermann RH (2010). GO–Bayes: Gene ontology-based over-representation analysis using a Bayesian approach. *Bioinformatics*, **26**, 905–911.
10. **Cao J**, Moosman A, Johnson VE (2010). A Bayesian goodness-of-fit test for censored data. *Biometrics*, **66**, 426–434.
11. **Cao J**, Stokes SL, Zhang S (2010). A Bayesian approach to ranking and rater evaluation: an application to grant reviews. *Journal of Educational & Behavioral Statistics*, **35**, 194–214.
12. **Cao J**, Stokes SL (2010). Evaluation of wine judge performance through three characteristics: bias, discrimination, and variation. *Journal of Wine Economics*, **5**(2), 132–142.
13. **Cao J**, Zhang S (2010). Measuring statistical significance for full Bayesian methods in microarray analysis. *Bayesian Analysis*, **5**, 413–428.
14. Livingston EH, **Cao J** (2010). Procedure volume as a predictor of surgical outcomes. *Journal of the American Medical Association*, **304**, 95–97.
15. Zhang S, **Cao J**, Ahn C (2010). Calculating sample size in trials using historical controls. *Clinical Trials*, **7**, 343–353.
16. Livingston EH, **Cao J**, Dimick JB (2010). Tread carefully with stepwise regression. *Archives of Surgery*, **145**, 1039–1040.
17. **Cao J** (2011). Unbiased FDR for full Bayesian methods in microarray analysis. *27th Southern Biomedical Engineering Conference Proceedings*, **5**:2.
18. Zhang S, **Cao J**, Ahn C (2013). Sample size calculation for studies comparing binary outcomes using historical controls. *Biometrical Journal*, **55**, 190–202.
19. Hodgson R, **Cao J** (2014). Criteria for accrediting expert wine judges. *Journal of Wine Economics*, **9**, 62–74.
20. Zhang S, **Cao J**, Ahn C (2014). A GEE approach to determine sample size for pre- and post-intervention experiments with dropout. *Computational Statistics & Data Analysis*, **69**, 114–121.
21. **Cao J**, Zhang S (2014). A Bayesian extension of the hypergeometric test for functional enrichment analysis. *Biometrics*, **70**, 84–94.
22. **Cao J** (2014). Quantifying randomness versus consensus among wine quality ratings. *Journal of Wine Economics*, **9**, 202–213.
23. **Cao J**, Zhang S (2014). Multiple comparison procedures. *Journal of the American Medical Association*, **312**, 543–544.
24. Olkin I, Lou Y, Stokes L, **Cao J** (2015). Analyses of wine-tasting data: A tutorial. *Journal of Wine Economics*, **10**, 4–30.
25. Zhang Y, **Cao J**, Zhang S, Lee AJ, Sun G, Larsen CN, Zhao H, Gu Z, He S, Klem EB, Scheuermann RH (2016). Genetic changes found in a distinct clade of enterovirus D68 associated with paralysis during the 2014 outbreak. *Virus Evolution*, 2016, 2: vew015.
26. Lou Y, **Cao J**, Zhang S, Ahn C (2017). Sample size calculations for time-averaged difference of longitudinal binary outcomes. *Communications in Statistics — Theory & Methods*, **46**, 344–353.
27. Lou Y, **Cao J**, Zhang S, Ahn C (2017). Sample size estimation for a two-group comparison of repeated count outcomes using GEE. *Communications in Statistics — Theory & Methods*, **46**, 6743–6753.
28. Zhang S, **Cao J**, Ahn C (2017). Inference and sample size calculation for clinical trials with incomplete observations of paired binary outcomes. *Statistics in Medicine*, **36**, 581–591.
29. Lou Y, **Cao J**, Ahn C (2017). Sample size estimation for comparing rates of change in K -group repeated count outcomes. *Communications in Statistics — Theory & Methods*, **46**, 11204–11213.
30. **Cao J** (2017). Bayesian functional enrichment analysis for the Reactome database. *Statistical Theory & Related Fields*, **1**, 185–193.
31. **Cao J**, Stokes SL (2017). Comparison of different ranking methods in wine tasting. *Journal of Wine Economics*, **12**, 203–210.

32. Elliott AC, Stokes SL, **Cao J** (2018). Cross-cultural issues in teaching ethics in a statistics curriculum, *The American Statistician*, **72**, 359–367.
33. Zhang S, **Cao J**, Ahn C (2018). Sample size calculation for before-after experiments with partially overlapping cohorts. *Contemporary Clinical Trials*, **64**:274–280.
34. Trivedi MH, South C, Jha MK, Rush AJ, **Cao J**, Kurian B, Phillips M, Pizzagalli DA, Trombello JM, Oquendo MA, Cooper C, Dillon DG, Webb C, Grannemann BD, Bruder G, McGrath PJ, Parsey R, Weissman M, Fava M (2018). A novel strategy to identify placebo responders: Prediction index of clinical and biological markers in the EMBARC trial. *Psychotherapy & Psychosomatics* **87**, 285–295.
35. South C, Elmore R, Clarage A, Sickorez R, **Cao J** (2019). A starting point for navigating the world of daily fantasy basketball. *The American Statistician*, **73**, 179–185.
36. Li D, **Cao J** (2019). Considering over-dispersion in the sample size calculation for clinical trials with repeated count measurements. *Statistics in Biopharmaceutical Research*, **11**, 283–291.
37. Moss HE, **Cao J**, Pineles SL (2019). Randomized controlled trials: A primer for neuro-ophthalmologists. *Journal of Neuro-Ophthalmology*, **40**, 3–7.
38. Li D, Zhang S, **Cao J** (2019). Sample size calculation for clinical trials with correlated count measurements based on the negative binomial distribution. *Statistics in Medicine*, **38**, 5413–5427.
39. Li D, **Cao J**, Zhang S (2020). Power analysis for cluster randomized trials with multiple binary co-primary endpoints. *Biometrics*, **76**, 1064–1074.
40. Li D, **Cao J**, Zhang S (2020). Incorporating pragmatic features into power analysis for clustered randomization trials with a count outcome. *Statistics in Medicine*, **39**, 4037–4050.
41. Barth J, Katumullage D, Yang C, **Cao J** (2021). Classification of wines using principal component analysis. *Journal of Wine Economics*, **16**, 56–67.
42. Wang, J, **Cao J**, Zhang S, Ahn C (2021). Sample size and power analysis for stepped wedge cluster randomized trials with binary outcomes. *Statistical Theory & Related Fields*, **5**, 162–169.
43. Wang, J, **Cao J**, Zhang S, Ahn C (2021). A flexible sample size solution for longitudinal and crossover cluster randomized trials with continuous outcomes. *Contemporary Clinical Trials*, accepted.
44. Katumullage D, Yang C, Barth J, **Cao J** (2021). Using Neural Network Models for Wine Review Classification. *Journal of Wine Economics*, **16**, 56–67.

Courses Taught

- STAT2331: Introduction to Statistical Methods
- STAT3300: Applied Statistical Methods (new course developed)
- STAT4399: Applied Regression Analysis and Data Visualization (new course developed)
- STAT6395: Introduction to Bayesian Statistical Learning (new course developed)
- STAT6345: Linear Regression
- STAT6391: Bayesian Hierarchical Modeling (new course developed)

Service to SMU

- Department graduate advisor, SMU, 2018–present
- Faculty Senate, SMU, 2018–present
- Senate Subcommittee on Libraries, SMU, 2016–present
- Procession Marshal at Graduation Ceremony, SMU, 2013–present
- Department PhD Recruitment Committee, SMU, 2005–2018
- Dedman College Tenure Promotion Advisory Committee, SMU, 2012–2017

Editorial Service

- *Journal of the American Statistical Association*
- *Journal of Computational & Graphical Statistics*
- *Journal of Statistical Planning & Inference*
- *Annals of Applied Statistics*
- *Statistics in Medicine*
- *Communications in Statistics*
- *Bioinformatics*
- *BMC Bioinformatics*
- *Test*
- *Journal of the American Medical Association*
- *Journal of Theoretical Biology*
- *Bayesian Analysis* (Managing Editor)

Professional Memberships

- American Statistical Association
- Institute of Mathematical Statistics
- International Chinese Statistical Association
- American Association of Wine Economists (elected fellow)

Service to the Profession

- ASA Professional Ethics Committee (chair, 2021 -)
- Supervisor, 2019 Women in Data Science and Technology Summer Internship program at Parkland Center for Clinical Innovation (PCCI)