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5218 SAS Hall

North Carolina State University

Raleigh, NC

Jonathan P Williams

PROFESSIONAL POSITIONS

Assistant Professor (tenure-track), Department of Statistics, NC State University	2019 -
Research Collaborator, Mayo Clinic, Rochester, MN	2017 - 2020
Biostatistics Intern, Mayo Clinic, Rochester, MN	Summer 2016
Statistical Consultant, Caster Concepts, Inc, Albion, MI	2011 - 2014

EDUCATION

University of North Carolina, Chapel Hill, NC 2014 - 2019

Department of Statistics and Operations Research

PhD Statistics

Advisors: Dr. Jan Hannig (UNC) and Dr. Curtis Storlie (Mayo Clinic)

New York University, New York, NY 2012 - 2014

Courant Institute of Mathematical Sciences

MS Mathematics

Advisor: Dr. Ying Lu

Eastern Michigan University, Ypsilanti, MI 2008 - 2012

Honors College

BS double major in Economics and Mathematics, minor in Finance

Summa Cum Laude

FUNDING

1. R56: Hidden Markov methodology for machine learning applied to identifying physiological states of shock in the intensive care unit via biomedical and unstructured text data (2021-2022). NIH R56HL155373, Sole-PI, 494,527 USD.

2. REU Site: Directed Research for Undergraduates in Math and Statistics (DRUMS) (2021-2024). NSF 2051010, NSA H98230-21-1-0014, Faculty Associate, 432,156/10,881 USD.

PEER-REVIEWED PAPERS

[†] Graduate student working under my supervision

[⋆] Undergraduate student working under my supervision

1. N Dey[†], J Ding[†], J Ferrell[⋆], C Kapper[⋆], M Lovig[⋆], E Planchon[⋆], and **J P Williams** (2021+). Conformal prediction for text infilling and part-of-speech prediction. *In review.*

2. I Carmichael, T Keefe, N Giertych[†], and **J P Williams** (2021+). yaglm: a Python package for fitting and tuning generalized linear models that supports structured, adaptive and non-convex penalties. *In progress.*

3. **J P Williams**, G H Hermansen, H M Nygård, G Clayton, S A Rustad, and H Strand (2021+). Do Ceasefires Work? A Bayesian autoregressive hidden Markov model to explore how ceasefires shape the dynamics of violence in civil war. *In review.*

4. S Koner[†] and **J P Williams** (2021+). The EAS approach to variable selection for multivariate response data in high-dimensional settings. *In review.*

5. **J P Williams** (2021). Discussion of "A Gibbs sampler for a class of random convex polytopes". *Journal of the American Statistical Association* 116 (535) pp.1198–1200.

6. A Murph[†], J Hannig, and **J P Williams** (2020+). Introduction to Generalized Fiducial Inference. *To appear in CRC Press BFF Handbook.*

7. **J P Williams**, D M Ommen, and J Hannig (2020+). Generalized fiducial factor: an alternative to the Bayes factor for forensic identification of source problems. *In review.*

8. S Nghiem, **J P Williams**, C Afoakwah, Q Huynh, S K Ng, and J Byrnes (2021). Can Administrative Health Data Improve the Gold Standard? Evidence from a Model of the Progression of Myocardial Infarction. *International Journal of Environmental Research and Public Health* 18 (14) pp.7385.

9. **J P Williams**, Y Xie, and J Hannig (2019+). The EAS approach for graphical selection consistency in vector autoregression models. *In review.*

10. **J P Williams**, C B Storlie, T M Therneau, C R Jack Jr, and J Hannig (2020). A Bayesian approach to multi-state hidden Markov models: application to dementia progression. *Journal of the American Statistical Association* 115 (529) pp.16–31.

11. **J P Williams** and J Hannig (2019). Non-penalized variable selection in high-dimensional linear model settings via generalized fiducial inference. *Annals of Statistics* 47 (3), pp.1723–1753.

12. E Sechi, E Shosha, **J P Williams**, S J Pittock, B G Weinshenker, B M Keegan, N L Zalewski, A S Lopez-Chiriboga, J Jitprapaikulsan, and E P Flanagan (2019). Aquaporin-4 and MOG autoantibody discovery in idiopathic transverse myelitis epidemiology. *Neurology* 93 (4), pp.e414–e420.

13. I Carmichael and **J P Williams** (2018). An exposition of the false confidence theorem. *Stat* 7 (1), pp.e201.

14. **J P Williams** and Y Lu (2015). Covariance Selection in the Linear Mixed Effect Model, *Journal of Machine Learning Research: Workshop and Conference Proceedings* 44, pp.277–291. (NIPS conference session)

PRESENTATIONS

1. Research experience at NC State University for undergraduate students. *Seminar*, Department of Mathematics, High Point University, October 2021.

2. Discussion of "A Gibbs sampler for a class of random convex polytopes". *JASA T&M Invited Session, Joint Statistical Meeting*, Seattle, WA, August 2021.

3. Generalized fiducial factor: an alternative to a Bayes factor for forensic identification of source problems. *Joint Statistical Meeting*, Seattle, WA, August 2021.

4. A Bayesian hidden Markov model framework for monitoring and diagnosing critically ill hospital patients. *28th Nordic Conference in Mathematical Statistics*, Tromsø, Norway, June 2021.

5. Generalized fiducial factor: an alternative to a Bayes factor for forensic identification of source problems. *BFF 6.5 – Virtual Workshop on Bayesian, Fiducial, and Frequentist Statistical Inference*, virtual conference hosted on https://researchers.one/, February 2021.

6. The EAS approach for graphical selection consistency in vector autoregression models. *12th International Conference of the European Research Consortium for Informatics and Mathematics Working Group on Computational and Methodological Statistics (CMStatistics 2019)*, University of London, UK, December 2019.

7. The EAS approach for graphical selection consistency in vector autoregression models. *Sixth Bayesian, Fiducial, and Frequentist Conference on Model Uncertainty*, Duke University and SAMSI, May 2019.

8. Non-penalized variable selection in high-dimensional settings via generalized fiducial inference. *Seminar*, Department of Statistics, University of Florida Gainesville, January 2019.

9. Non-penalized variable selection in high-dimensional settings via generalized fiducial inference. *Seminar*, Department of Statistics, Iowa State University, January 2019.

10. Non-penalized variable selection in high-dimensional settings via generalized fiducial inference. *Seminar*, Department of Statistics, University of Illinois Urbana–Champaign, December 2018.

11. Non-penalized variable selection in high-dimensional settings via generalized fiducial inference. *Seminar*, Department of Statistics, North Carolina State University, December 2018.

12. Non-penalized variable selection via generalized fiducial inference. *Graduate Seminar*, Department of Statistics and Operations Research, UNC Chapel Hill, November 2018.

13. Non-penalized variable selection via generalized fiducial inference. *AISC 2018 International Conference on Advances in Interdisciplinary Statistics and Combinatorics*, UNC Greensboro, October 2018.

14. Non-penalized variable selection in high-dimensional settings via generalized fiducial inference. *27th Nordic Conference in Mathematical Statistics*, Tartu, Estonia, June 2018.

15. A Bayesian approach to multi-state hidden Markov models: application to dementia progression. *Graduate Seminar*, Department of Statistics and Operations Research, UNC Chapel Hill, September 2017.

16. Non-penalized variable selection in high-dimensional linear model settings via generalized fiducial inference. *Graduate Seminar*, Department of Statistics and Operations Research, UNC Chapel Hill, February 2017.

17. A Bayesian approach to multi-state hidden Markov models: application to dementia progression. *Tea Time for Science*, Biomedical Statistics and Informatics, Health Sciences Research, Mayo Clinic, Rochester, MN, August 2016.

POSTER PRESENTATIONS

1. A statistical primer on classical methods for exoplanet detection. *Statistical Challenges in Modern Astronomy VII conference*, virtual conference, June 2021.

2. Non-penalized variable selection via generalized fiducial inference. *Recycled Poster Session of the North Carolina Chapter of the American Statistical Association*, SAS Campus, NC, September 2019.

3. Non-penalized variable selection via generalized fiducial inference. *Fifth Bayesian, Fiducial, and Frequentist Conference*, University of Michigan Ann Arbor, May 2018.

4. Generalized fiducial inference for high dimensional problems. *Invited Poster Session, Joint Statistical Meeting*, Baltimore, MD, July 2017.

5. Non-penalized variable selection in high-dimensional linear model settings via generalized fiducial inference. *Fourth Bayesian, Fiducial, and Frequentist Conference*, Harvard University, May 2017.

6. Covariance Selection in the Linear Mixed Effect Model. *Feature Extraction: Modern Questions and Challenges, NIPS*, Montreal, Canada, December 2015.

AWARDS

- Best poster award, *Recycled Poster Session of the NC ASA*   September 2019
- Graduate Student Travel Grant – 1,000 USD   Summer 2018
- Carl M. Erikson Mathematics Department Scholarship   2011 - 2012
- Regents Scholarship   2009 - 2012
- National Scholars Program Scholarship   2008 - 2012
- Leader Award Scholarship   2009 - 2011

PROFESSIONAL ACTIVITIES

- Session Chair; Statistics for complex inference problems in data science. *12th International Conference of the European Research Consortium for Informatics and Mathematics Working Group on Computational and Methodological Statistics (CMStatistics 2019)*, University of London, UK, December 2019.

- Session Chair; Statistical Controversies in Forensic Evidence Interpretation. *International Chinese Statistical Association Conference*, Raleigh, NC, June 2019.

- Referee for *Mathematics*   1 time
- Referee for *Statistical Methods in Medical Research*   1 time
- Referee for *Journal of the American Statistical Association – Theory and Methods* 1 time
- Referee for *Biometrics*   1 time
- Referee for *Communications in Statistics – Theory and Methods*   1 time
- Referee for *Journal of Computational and Graphical Statistics*   1 time
- Referee for *Computers*   1 time
- Referee for *PLOS ONE*   1 time
- Referee for *Stat*   6 times
- Referee for *Journal of Statistical Planning and Inference*   1 time
- Referee for *Statistical Modelling*   1 time
- Referee for *Negotiation Journal*   1 time
- Referee for *CRC Press*   1 time
- Referee for *Stats*   1 time

TEACHING AND ADVISING

Courses taught:
- Advanced computing for statistical methods (undergraduate; ST 495 NCSU)   Spring '22
- Introduction to probability and distribution theory (undergraduate; ST 371 NCSU)   Fall '20
- Linear models (graduate; ST 705 NCSU)   Spring '20, '21, '22
- Fundamentals of statistical inference II (graduate; ST 502 NCSU)   Fall '19
- STOR-BIOS grad student boot camp (real analysis section; UNC)   Summer '17
- Introduction to statistics (first year undergraduate; STOR 155 UNC)   Spring '16, Fall '16
- Tutor (economics and mathematics undergraduate; EMU)   '09 - '12

PhD students advised/co-advised:
1. Neil Dey (NCSU; expected graduation Summer 2025)
2. Emmett Kendall (NCSU; expected graduation Summer 2025)
3. Mohamed Abba (NCSU; expected graduation Summer 2023)
4. Naomi Giertych (NCSU; expected graduation Summer 2023)
5. Jimmy Hickey (NCSU; expected graduation Summer 2024)
6. Alexander Murph (UNC; expected graduation Summer 2023)
7. Salil Koner, PhD, NCSU   2021

PhD committees served on:
1. Xinyu Zhang (NCSU; expected graduation Summer 2023)
2. Yin-Jen Chen (NCSU; expected graduation Summer 2022)

3. Annie Tang (NCSU; expected graduation Summer 2022)

4. Kang Wang (NCSU; expected graduation Summer 2022)

5. Pei-Shien Wu (NCSU; expected graduation Summer 2022)

6. Ian Grace (NCSU; expected graduation NA)

Undergraduate students mentored:
1. Jack Ferrell (University of Florida; REU student 2021)

2. Carolina Kapper (High Point University; REU student 2021)

3. Maxwell Lovig (University of Louisiana, Lafayette; REU student 2021)

4. Emiliano Planchon (NCSU; REU student 2021)

5. Pragya Haravu (NCSU; expected graduation 2023)

DEPARTMENT SERVICE

- Qualifying exam committee NCSU   January 2022
- Seminar committee NCSU   Fall 2021
- Seminar committee NCSU   Spring 2021
- Qualifying exam committee NCSU   January 2021
- Qualifying exam committee NCSU   August 2020

COMPUTING SKILLS

R, Python, Julia, Linux, HPC environments