

# JAMES BAILIE

## *Curriculum Vitae*

November 2025

### CONTACT INFORMATION

CSE/DSAI  
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### CURRENT POSITION

#### **Chalmers University of Technology**

9/2025–

*Doktor* (i.e. postdoc)

Division of Data Science & AI, Department of Computer Science and Engineering

Supervisor: Prof. Adel Daoud (AI & Global Development Lab)

### PREVIOUS POSITIONS

#### **Institute of Employment Research (IAB)**

6/2025–8/2025

*Wissenschaftlicher Mitarbeiter* (i.e. research fellow)

Supervisor: Prof. Jörg Drechsler

#### **Australian Bureau of Statistics**

Mathematical Statistics Specialist

11/2018–8/2020

Graduate

2/2018–11/2018

Methodology Division

#### **Australian Department of the Prime Minister and Cabinet**

4/2020–5/2020

On secondment in the Covid-19 Taskforce

#### **Menzies School of Health Research**

Data Analyst

7/2013–5/2016

IT Assistant

11/2011–6/2013

### EDUCATION

#### **Harvard University**

PhD, Statistics, 2025.

Thesis: *Topics in Privacy, Data Privacy and Differential Privacy*

Committee: Profs. Xiao-Li Meng (chair), Kosuke Imai, Salil Vadhan & Adam Smith

MA, Statistics, 2024.

#### **Australian National University**

BSc (with first class honours), Mathematics, 2017.

Thesis: *Vector Fields on Spheres*

Thesis Advisor: Dr. Vigleik Angeltveit

## PAPERS

<sup>†</sup> indicates alphabetical ordering of authors.

### PREPRINTS & WORKING PAPERS

13. JB and Ruobin Gong (2025). “The Five Safes as a Privacy Context”. DOI: 10.48550/arXiv.2510.05803
12. JB<sup>†</sup> and Rabanus Derr<sup>†</sup> (2025). “Property Elicitation on Imprecise Probabilities”. DOI: 10.48550/arXiv.2507.05857
11. Julian Rodemann and JB (2025). “Generalization Bounds and Stopping Rules for Learning with Self-Selected Data”. DOI: 10.48550/arXiv.2505.07367
10. JB, Ruobin Gong and Xiao-Li Meng (2025). “A Refreshment Stirred, Not Shaken (III): Can Swapping Be Differentially Private?” To appear in the edited NBER volume *Data Privacy Protection and the Conduct of Applied Research: Methods, Approaches and Their Consequences*. DOI: 10.48550/arXiv.2504.15246
9. JB, Ruobin Gong and Xiao-Li Meng (2025). “A Refreshment Stirred, Not Shaken (II): Invariant-preserving Deployments of Differential Privacy for the US Decennial Census”. DOI: 10.48550/arXiv.2501.08449
8. Mohammad Kakooei, JB, Albin Söderberg, Albin Becevic and Adel Daoud (2024). “Mapping Africa Settlements: High Resolution Urban and Rural Map by Deep Learning and Satellite Imagery”. DOI: 10.48550/arXiv.2411.02935
7. Jörg Drechsler and JB (2024). “The Complexities of Differential Privacy for Survey Data”. To appear in the edited NBER volume *Data Privacy Protection and the Conduct of Applied Research: Methods, Approaches and Their Consequences*. DOI: 10.48550/arXiv.2408.07006
6. JB and Jörg Drechsler (2024). “Whose Data Is It Anyway? Towards a Formal Treatment of Differential Privacy for Surveys”. *Data Privacy Protection and the Conduct of Applied Research: Methods, Approaches and Their Consequences*. Washington D.C.: National Bureau of Economic Research. URL: [conference.nber.org/conf\\_papers/f194306.pdf](https://conference.nber.org/conf_papers/f194306.pdf)

### JOURNAL PUBLICATIONS

5. Matthew J. Schneider, JB and Dawn Iacobucci (2025). “Why Data Anonymization Has Not Taken Off”. *Customer Needs and Solutions* 12 (9). ISSN: 2196-2928. DOI: 10.1007/s40547-025-00158-5
4. JB and Ruobin Gong (2024). “General Inferential Limits under Differential and Pufferfish Privacy”. *International Journal of Approximate Reasoning* 172: 109242. ISSN: 0888-613X. DOI: 10.1016/j.ijar.2024.109242
3. JB (2020). “Big Data, Differential Privacy and National Statistical Organisations”. *Statistical Journal of the IAOS* 36 (4): 1067–1074. ISSN: 1874-7655. DOI: 10.3233/SJI-200685

### CONFERENCE PROCEEDINGS

2. JB and Ruobin Gong (2023). “Differential Privacy: General Inferential Limits via Intervals of Measures”. *Proceedings of the Thirteenth International Symposium on Imprecise Probability: Theories and Applications*. Vol. 215. PMLR, pp. 11–24. URL: [proceedings.mlr.press/v215/bailie23a.html](https://proceedings.mlr.press/v215/bailie23a.html)
1. JB and Chien-Hung Chien (2019). “ABS Perturbation Methodology through the Lens of Differential Privacy”. *Work Session on Statistical Data Confidentiality, UN Economic Commission for Europe*, p. 13. URL: [unece.org/sites/default/files/datastore/fileadmin/DAM/stats/documents/ece/ces/ge.46/2019/mtg1/SDC2019\\_S2\\_ABS\\_Bailie\\_D.pdf](https://unece.org/sites/default/files/datastore/fileadmin/DAM/stats/documents/ece/ces/ge.46/2019/mtg1/SDC2019_S2_ABS_Bailie_D.pdf)

## THESES & EXPOSITORY WORKS

11. JB (2025). “Topics in Privacy, Data Privacy and Differential Privacy”. PhD thesis. Cambridge, MA: Harvard University, p. 465. URL: [proquest.com/docview/3217403500/abstract/5B30DA0A3D85414APQ/1](https://proquest.com/docview/3217403500/abstract/5B30DA0A3D85414APQ/1)
10. JB (2021). “Navigating Spatio-Temporal Data with Generalised Additive Models”. URL: [jameshbailie.github.io/files/papers/2021-09-30-Navigating-spatio-temporal-data-with-generalised-additive-models.pdf](https://jameshbailie.github.io/files/papers/2021-09-30-Navigating-spatio-temporal-data-with-generalised-additive-models.pdf)
9. JB (2021). “Lecture Notes on Asymptotic Statistics”. URL: [jameshbailie.github.io/files/papers/2021-06-16-Asymptotic-statistics.pdf](https://jameshbailie.github.io/files/papers/2021-06-16-Asymptotic-statistics.pdf)
8. JB (2021). “Lecture Notes on Stochastic Processes”. URL: [jameshbailie.github.io/files/papers/2021-10-06-Stochastic-processes.pdf](https://jameshbailie.github.io/files/papers/2021-10-06-Stochastic-processes.pdf)
7. JB (2017). “Vector Fields on Spheres”. Honours thesis. Canberra, Australia: Australian National University, p. 112. DOI: 10.25911/5d9efbbf95202
6. JB (2017). “Semisimple Categories”. URL: [jameshbailie.github.io/files/papers/2017-06-26-Semisimple-categories.pdf](https://jameshbailie.github.io/files/papers/2017-06-26-Semisimple-categories.pdf)
5. JB (2017). “Abelian Categories and Mitchell’s Embedding Theorem”. URL: [jameshbailie.github.io/files/papers/2017-06-16-Abelian-categories-and-Mitchells-embedding-theorem.pdf](https://jameshbailie.github.io/files/papers/2017-06-16-Abelian-categories-and-Mitchells-embedding-theorem.pdf)
4. JB (2017). “A Künneth Formula for Complex K Theory”. URL: [jameshbailie.github.io/files/papers/2017-06-06-A-Kunneth-formula-for-complex-K-theory.pdf](https://jameshbailie.github.io/files/papers/2017-06-06-A-Kunneth-formula-for-complex-K-theory.pdf)
3. JB (2017). “Stable Homotopy Theory and Category of Spectra”. Vacation Research Scholarship Report. Australian Mathematical Sciences Institute. URL: [jameshbailie.github.io/files/papers/2017-02-01-Stable-homotopy-theory-and-category-of-spectra.pdf](https://jameshbailie.github.io/files/papers/2017-02-01-Stable-homotopy-theory-and-category-of-spectra.pdf)
2. JB (2016). “Kolmogorov Complexity and the Symmetry of Algorithmic Information”. URL: [jameshbailie.github.io/files/papers/2016-11-01-Kolmogorov-complexity-and-the-symmetry-of-algorithmic-information.pdf](https://jameshbailie.github.io/files/papers/2016-11-01-Kolmogorov-complexity-and-the-symmetry-of-algorithmic-information.pdf)
1. JB (2016). “Hausdorff and Similarity Dimensions”. URL: [jameshbailie.github.io/files/papers/2016-10-24-Hausdorff-and-similarity-dimensions.pdf](https://jameshbailie.github.io/files/papers/2016-10-24-Hausdorff-and-similarity-dimensions.pdf)

## HONOURS

- *Emerging Talent Award* at ISIPTA 2023 for “Differential privacy: General inferential limits via intervals of measures”.
- *3rd Prize in the Young Statisticians Competition*, International Association for Official Statistics (2020) for “Big Data, Differential Privacy and National Statistical Organisations”.
- *Fulbright Future Scholarship*, Australian-American Fulbright Commission (2020–2025).
- *2019 Ken Foreman Award*, Australian Bureau of Statistics.
- *Census and Data Services Group Excellence Award*, Australian Bureau of Statistics (2019).
- Undergraduate: *Hanna Neumann Prize for Third Year Mathematics* (2016); *Boyapati Computer Science and Mathematics Prize for Second Year* (2015); *Boyapati Computer Science and Mathematics Prize for First Year* (2014).
- Papers invited (and submitted) to special issues:
  1. JB and Ruobin Gong (2024). “General Inferential Limits under Differential and Pufferfish Privacy”. *International Journal of Approximate Reasoning* 172: 109242. ISSN: 0888-613X. DOI: 10.1016/j.ijar.2024.109242

## PROFESSIONAL ACTIVITIES & SERVICE

### SERVICE TO THE PROFESSION

- Communications Committee, Privacy and Confidentiality Interest Group of the American Statistical Association (August 2025–).
- Organised the 2018 Australian Public Service Graduate Roundtable.
- Co-launched the Australian Public Service Graduate Data Network (April 2018).
- Journal and Conference Refereeing:
  - 2025*: Journal of Privacy and Confidentiality; International Journal of Approximate Reasoning; Journal of Machine Learning Research; Harvard Data Science Review ( $\times 2$ ).
  - 2024*: Journal of Machine Learning Research; Harvard Data Science Review ( $\times 2$ ); Privacy and Public Policy Conference.
  - 2022*: Harvard Data Science Review.

### UNIVERSITY & DEPARTMENT SERVICE

- Panelist, Graduate Student Panel (for an Undergrad Audience), Harvard Statistics Department (October 2024).
- Graduate Student Mentor for first year statistics PhD students (2022, 2023).
- Member of the Harvard Graduate Statistics Council (2021–2025).
- Co-organiser, Harvard Graduate Statistics Annual Retreat and Faculty Research Lightning Talks (2021–2023).

### OTHER ACTIVITIES

- Visitors hosted: Julian Rodemann (9–11/2025).
- Research visits:
  - Center for Advanced Study in the Behavioural Sciences, Stanford University* (6/2024), hosted by Prof. Adel Daoud.
  - Department of Statistics, Rutgers University* (2/2024), hosted by Prof. Ruobin Gong.
  - Department of Computer Science and Engineering, Chalmers University* (10/2022), hosted by Prof. Adel Daoud.
- Professional associations:
  - International Society of Bayesian Analysis (2024–)
  - Institute of Mathematical Statistics (2022–)
  - International Association for Official Statistics (2020–2021)
  - Statistical Society of Australia (2018–2020)

## FUNDING

- *Spring 2025 Conference Grant*, US\$750, Harvard Griffin GSAS Student Council.
- *PrivaCI Symposium NSF Travel Grant*, US\$1000 (2023).
- *Artificial Intelligence Journal Fellowships for PhD Students*, €1000, ISIPTA 2023.
- *Fulbright Future Scholarship*,  $\approx$ US\$299,000, Australian-American Fulbright Commission (2020–2025).
- Undergraduate: *ANU Honours Scholarship*, AU\$5000 (2017); *Hilary Booth Honours Scholarship*, AU\$5000 (2017) (declined due to concurrency restrictions); *Vacation Research Scholarship*,  $\approx$ AU\$3000, Australian Mathematical Sciences Institute (2016); *Summer Research Scholarship*, AU\$3000, University of Queensland (2013–2014).

## TEACHING & ADVISING

### COURSES TAUGHT AS A TEACHING FELLOW

#### Harvard University

- STAT 188: *Variations, Information and Privacy* Fall 2023  
New course.  
Instructor of record: Prof. Xiao-Li Meng
- STAT S-115: *Data Science: An Artificial Ecosystem* Summer 2023  
New course.  
Instructor of record: Prof. Xiao-Li Meng
- STAT 288: *Deep Statistics: AI and Earth Observations for Sustainable Development* Spring 2022, 2023  
New graduate course.  
Instructor of record: Prof. Xiao-Li Meng
- STAT 305R: *Statistical Consulting* Fall 2022, Spring 2023  
Instructor of record: Prof. Lucas Janson

#### Australian National University

- MATH 1116: *Advanced Mathematics and Applications 2* Sem. 2, 2017  
Instructor of record: Dr. Griffith Ware
- MATH 1115: *Advanced Mathematics and Applications 1* Sem. 1, 2017  
Instructor of record: Dr. Griffith Ware

#### Other

- NANO 288: *Deep Statistics for More Rigorous and Efficient Data Science* 12/2023  
2023 Australian Statistical Conference workshop  
Instructor of record: Prof. Xiao-Li Meng

### UNDERGRADUATE ADVISING

- *Will Hahn* (summer 2024), Harvard College Research Program. Co-advised with Prof. Xiao-Li Meng.
- *Danielle Paulson* (summer 2023), Harvard Program for Research in Science and Engineering, *A Bayesian Multiple Imputation Procedure to Quantify Uncertainty Due to Privacy Protection*. Co-advised with Profs. Xiao-Li Meng and Adel Daoud.

## TALKS

### INVITED PRESENTATIONS

28. *Composition of Privacy Mechanisms: Only Fresh Noise Counts*, *9th Bayesian, Fiducial, and Frequentist (BFF9) Conference*, Indianapolis, USA, May 2025.
27. *Differential Privacy in Statistical Agencies—Challenges and Opportunities*, *2nd Ocean Workshop on Privacy*, Les Houches, France, February 2025.
26. *How Does Differential Privacy Limit Disclosure Risk? A Precise Prior-To-Posterior Analysis*, *ISBA World Meeting*, Venice, Italy, July 2024.
25. *Privacy, Data Privacy, and Differential Privacy*, *Humanising Machine Intelligence Workshop—Celebrating Integrated AI* (keynote, joint w/ Xiao-Li Meng), Australian National University, Canberra, December 2023.
24. *A Discrete Calibration Approach to Improving Data Linkage*, *ABS Methodology Advisory Committee*, Sydney, Australia, March 2019.

## DEPARTMENT COLLOQUIA

23. Privacy, Data Privacy and Differential Privacy, *LMU Munich Statistics Department*, Germany, July 2024.
22. Privacy, Data Privacy and Differential Privacy, *Tübingen AI Center*, Germany, July 2024.
21. Can Swapping Be Differentially Private? A Refreshment Stirred Not Shaken, *Statistics Canada Methodology Seminar*, virtual, October 2023.
20. Can Swapping Be Differentially Private? A Refreshment Stirred Not Shaken, *US Census Bureau Cooperative Agreement Retreat*, Boston University Center for Computing and Data Science, USA, September 2023.
19. Privacy, Data Privacy and Differential Privacy, *Australian Bureau of Statistics*, Canberra, June 2022.

## CONFERENCES

18. Composition of Privacy Mechanisms: Only Fresh Noise Counts, *Joint Statistical Meetings* (topic-contributed paper session), Nashville, USA, August 2025.
17. Property Elicitation on Imprecise Probabilities, *14th International Symposium on Imprecise Probabilities: Theories and Applications*, Bielefeld, Germany, June 2025.
16. Enhancing Digital Twins with Privacy-Aware EO-ML Methods, *Harvard Center for Geographic Analysis Conference: The Geography of Digital Twins*, Cambridge, USA, May 2025.
15. Can Swapping Be Differentially Private? A Refreshment Stirred, Not Shaken, *Privacy and Public Policy Conference*, Georgetown University, USA, September 2024.
14. Navigating Privacy and Utility with Multiple Imputation, Satellite Imaging and Deep Learning, *Joint Statistical Meetings*, Portland, USA, August 2024.
13. Whose Data Is It Anyway? Towards a Formal Treatment of Differential Privacy for Surveys, *Data Privacy Protection and the Conduct of Applied Research: Methods, Approaches and Their Consequences*, NBER, Washington DC, USA, May 2024.
12. Statistical Preprocessing for Privacy-Induced Spatial Mismatch: A Multiple Imputation Approach to Poverty Prediction Using Deep Learning, *Australian Statistical Conference*, Wollongong, Australia, December 2023.
11. Can Swapping Be Differentially Private? A Refreshment Stirred, Not Shaken, *Australian Statistical Conference*, Wollongong, Australia, December 2023.
10. The Five Safes as a Privacy Context, *5th Annual Symposium on Applications of Contextual Integrity*, Toronto, Canada, September 2023.
9. Can Swapping Be Differentially Private? A Refreshment Stirred, Not Shaken, *Joint Statistical Meetings*, Toronto, Canada, August 2023.
8. Differential Privacy: General Inferential Limits via Intervals of Measures, *13th International Symposium on Imprecise Probabilities: Theories and Applications*, Oviedo, Spain, July 2023.
7. Can Swapping Be Differentially Private? A Refreshment Stirred, Not Shaken, *36th New England Statistical Symposium*, Boston University, USA, June 2024.
6. Can Swapping Be Differentially Private? A Refreshment Stirred, Not Shaken, *Data Privacy Protection and the Conduct of Applied Research: Methods, Approaches and Their Consequences*, NBER, Cambridge, USA, May 2023.
5. Designing Formally Private Mechanisms for the  $p\%$  Rule, *Workshop on Advances in Statistical Disclosure Limitation*, National Institute for Applied Statistics Research Australia, University of Wollongong, February 2020.
4. Using Admin Data and Machine Learning to Predict Dwelling Occupancy on CensusNight, *Statistical Society of Australia's Young Statisticians Conference*, Canberra, October 2019.
3. Stable Homotopy Theory, *Australian Mathematical Sciences Institute Connect Conference*, University of Melbourne, February 2017.

## GUEST LECTURES

2. Can Swapping Be Differentially Private? A Refreshment Stirred, Not Shaken, *Stat 188*, *Harvard University*, Cambridge, USA, September 2024.
1. On the Mismatch Between the Prior and the Likelihood Resolutions When Accounting for DHS Privacy Protection, *Stat 288*, *Harvard University*, Cambridge, USA, April 2024.

**Last updated: 7th November 2025.**