JAMES BAILIE

Curriculum Vitae

November 2025

Contact Information

CSE/DSAI
Gibraltarvallsvägen 7
412 58 Göteborg
Sweden

[last-name]@chalmers.se
jameshbailie.github.io

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

† 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**† and Rabanus Derr† (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

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

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

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
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
9. **JB** (2021). "Lecture Notes on Asymptotic Statistics". URL: 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
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
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
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
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
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
1. **JB** (2016). "Hausdorff and Similarity Dimensions". URL: 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 (×2).

  2024: Journal of Machine Learning Research; Harvard Data Science Review (×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*, ≈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*, ≈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*
  New graduate course. — Spring 2022, 2023
  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.

Selected 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. 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.
23. A Discrete Calibration Approach to Improving Data Linkage, *ABS Methodology Advisory Committee*, Sydney, Australia, March 2019.

Department Colloquia

22. Privacy, Data Privacy and Differential Privacy, *LMU Munich Statistics Department*, Germany, July 2024.

21. Privacy, Data Privacy and Differential Privacy, *Tübingen AI Center*, Germany, July 2024.

20. Can Swapping Be Differentially Private? A Refreshment Stirred Not Shaken, *Statistics Canada Methodology Seminar*, virtual, October 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, Oregon, 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: 8th November 2025.