Andrew Manderson

PhD student

MRC Biostatistics Unit, University of Cambridge; The Alan Turing Institute

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Education

University of Cambridge *Cambridge, UK*

PhD, Biostatistics *Oct 2018 – Jun 2022 (expected)*

- Bayesian methods for integrating multiple sources of information, predictive elicitation and Bayesian optimisation.
- Applications include respiratory failure and electronic health records; evidence synthesis models for influenza; population ecology.
- Funded by a scholarship from The Alan Turing Institute (5 awarded to international students from approx. 300 applications).

The University of Western Australia *Perth, Australia*

Master of Philosophy, Statistics *Jan 2016 – Jan 2018*

- Thesis: Methodology for Bayesian Monotonic Polynomials.

The University of Western Australia *Perth, Australia*

Bachelor of Science, Honours (First class) *Jan 2015 – Nov 2015*

- Thesis: Dynamic Bayesian forecasting of AFL match results using the Skellam distribution.
- Grade point average: 7/7; Weighted average mark: 86.5/100.

The University of Western Australia *Perth, Australia*

Bachelor of Science *Mar 2012 – Nov 2014*

- Majors: Engineering Science, Mathematics and Statistics.
- Grade point average: 6.25/7; Weighted average mark: 78/100.

Work experience

MRC Biostatistics Unit *Cambridge, UK*

Research Assistant *Apr 2020 – Sep 2020*

- Member of the MRC Biostatistics Unit's DECOVID team, and the project-wide software and tooling team.
- Project used electronic health records to improve care for COVID-19 patients with co-occurring haemotological conditions.

Oceans Institute, The University of Western Australia *Perth, Australia*

Research Assistant *Mar 2018 – Sep 2018*

- Statistician on a multidisciplinary team of Oceanographers, Software Engineers and Statisticians.
- Joint project between the UWA Oceans institute and The Alan Turing Institute.
- First author on resulting publication.

Centre for Applied Statistics, The University of Western Australia *Perth, Australia*

Statistical Consultant *Sep 2017 – Nov 2017*

- Applied statistician for veterinary science study into an exercise induced disease in horses.

The University of Western Australia *Perth, Australia*

Demonstrator, content developer *2015 – 2018*

- Wrote and taught tutorials for masters level unit on Bayesian statistics and computational methods.
- Demonstrator for the first and second year undergraduate classes called 'Statistics for science' and 'Analysis of Observations'.

Publications

Manderson, A. A., and Goudie, R. J. B. (2022) A numerically stable algorithm for integrating Bayesian models using Markov melding. *Statistics and Computing (in press)*. Available at: arxiv.org/abs/2001.08038.

Manderson, A. A., and Goudie, R. J. B. (2021) Combining chains of Bayesian models with Markov melding. *Bayesian Analysis (submitted)*. Available at: arxiv.org/abs/2111.11566.

Manderson, A. A., Murray, K. and Turlach, B. A. (2020) Chapter 9 - Flexible regression modelling under shape constraints. In *Flexible Bayesian Regression Modelling* (eds Y. Fan, D. Nott, M. S. Smith, and J.-L. Dortet-Bernadet), pp. 251–279. Academic Press. DOI: 10.1016/B978-0-12-815862-3.00014-7.

Crispe, E. J., Secombe, C. J., Perera, D. I., **Manderson, A. A.,** et al. (2019) Exercise-induced pulmonary haemorrhage

in Thoroughbred racehorses: A longitudinal study. *Equine Veterinary Journal*, **51**, 45–51. DOI: 10.1111/evj.12957.

Manderson, A. A., Rayson, M. D., Cripps, E., Girolami, M., et al. (2019) Uncertainty quantification of density and stratification estimates with implications for predicting ocean dynamics. *Journal of Atmospheric and Oceanic Technology*, **36**, 1313–1330. American Meteorological Society. DOI: 10.1175/JTECH-D-18-0200.1.

Manderson, A. A., Murray, K. and Turlach, B. A. (2018) Dynamic Bayesian forecasting of AFL match results using the Skellam distribution. *Australian & New Zealand Journal of Statistics*, **60**, 174–187. DOI: 10.1111/anzs.12225.

Manderson, A. A., Cripps, E., Murray, K. and Turlach, B. A. (2017) Monotone polynomials using BUGS and Stan. *Australian & New Zealand Journal of Statistics*, **59**, 353–370. DOI: 10.1111/anzs.12207.

Talks

Combining Chains of Bayesian Models with Markov Melding

Multiple *2021*

- Royal Statistical Society's International conference (contributed talk, Sep 2021, Manchester, UK)
- Joint Statistical Meetings (speed presentation, Aug 2021, virtual)
- Department-wide seminar (May 2021, virtual)

Combining multiple sources of information with Markov melding

The University of Western Australia *Feb 2020*

- Invited seminar

Dynamic Bayesian forecasting of AFL match results using the Skellam distribution

The University of Western Australia *Oct 2015*

- Awarded best talk out of all mathematics Honours students.

Service

- Reviewer for *Bayesian Analysis*, *Computational Statistics*, *AStA Advances in Statistical Analysis*, *Australian & New Zealand Journal of Statistics*.
- Co-organiser of *Biostatistics for chronic diseases*, a one day conference (Oct 2021) for the application of biostatistics and statistical genetics to chronic diseases.

Skills

- I am an expert `R` and `Stan` user, having been regular user of both for nearly 8 years. I make open source contributions to various `R` packages in the `Stan` ecosystem, and have written many of my own R packages to support my research.
  - See my GitHub for examples, including `wsre`, `pbbo`, `ddcurves2`, `rjmonopoly`.
- I strive to make my research highly reproducible, and consequently make heavy use of `git` and `make`.
- I have a working knowledge of `SQL` from my work with electronic health records (particularly OMOP, SNOMED/ICD10, MIMIC-III), and `python` from collaborative work with subject-matter experts.

References

Details available on request

- Dr Robert Goudie (Senior Research Associate, MRC Biostatistics Unit)
- Dr Berwin Turlach (Associate Professor, the University of Western Australia)
- Dr Edward Cripps (Associate Professor, the University of Western Australia)
- Paul?