CV for Ian Hunt

1 Consulting Résumé

Ian has been an independent statistical consultant and researcher for over twenty years. His research focuses on applying statistics and probability theory to both physical and social sciences. As a consultant, he is a specialist in prediction error assessment, expressing uncertainty in plain language, and explaining statistical inference to scientific researchers and non-specialists.

At the University of Tasmania, Ian leads the statistics and data science services for researchers and PhD students from the Tasmanian Institute of Agriculture. He also teaches statistics and programming to undergraduate and post-graduate students.

Ian has published work in leading peer-reviewed journals (defined as *at least* top quartile in their field globally, according to Clarivate or Scopus) from a wide variety of disciplines, including law, statistics, economics, medicine, agriculture, environmental science and engineering.

Ian is a Chartered Statistician (CStat) and Fellow of the Royal Statistical Society (RSS); and also serves on the RSS committee for Statistics and the Law. Ian holds post-graduate degrees, with honours, from Université Catholique de Lille/EDHEC (France), the London School of Economics (London), City University (London) and Otago (New Zealand). Ian also holds a post-graduate accreditation in statistics and data science from MIT (USA).

1.1 Specialities

Ian has technical expertise and consulting experience in the following areas: hypothesis testing and practical Bayesian inference; data dimension reduction and re-structuring; experimental design and ANOVA-style analysis; survey design and analysis; survival analysis and related testing; linear mixed models in pharmacology, psychology, agriculture and medical trials; and investment return analysis (including multi-manager funds, multi-asset class portfolios and forecast-model assessment).

Ian has also worked on a variety of clinical trials in medicine, from protocol development stages through to completion. He is currently the lead statistician on several ongoing clinical trials for cancer treatments and research.

2 Formal CV

2.1 Professional experience

- 2021-present. *Senior Lecturer, University of Tasmania*: head of statistics and data science at the Tasmanian Institute of Agriculture, College of Science and Engineering. Research and lecturing.
- 2000-present. *Consulting Statistician (independent)*: general statistics and econometrics. General statistical projects include clinical trials in medicine, legal statistics (including expert evidence) and survey sampling. Financial markets projects include investment return analysis, multi-manager comparisons, statistical programming and asset allocation (clients have included Goldman Sachs, ABN AMRO, Colonial First State, CBA and large public charities).
- 2019-2021. *Manager, Monash University Statistical Consulting Service*: one-to-one consulting with the university's researchers; design and delivery of PhD statistics courses for non-specialists; co-ordination of overall statistical consulting at Monash; and applied research.
- 2015-2019. *Lecturer, EDHEC (France)*: course co-ordinator (design and teaching) of various MSc courses including statistics/econometrics and statistical programming in R, Matlab and Python; and MSc dissertation mentorship and supervision.
- 1996-2000. *Credit Suisse First Boston* (equity research — property and retail sectors); *Deutsche Bank* (corporate finance); and *Frank Russell Company* (portfolio return simulation).

2.2 Qualifications

- *Doctorate* in econometrics and statistical forecasting from Université Catholique de Lille, France (EDHEC, a Grande École). Thesis topic was on assessing prediction error and model over-fitting (in other words, trying to work out why your model that explains the past so well doesn't predict the future ...). Submitted thesis required no revisions and was awarded the highest grade by the *viva* committee and external examiner, Francis Diebold, Professor of Statistics and Data Science at Wharton, The University of Pennsylvania.
- *MSc* in philosophy of science from the LSE, London (with honours); *MSc* in quantitative finance from City University, London (with honours); *Statistics and Data Science Micro-Masters* accreditation from MIT, USA (97% ave); *Postgraduate Diploma in Applied Statistics* from Otago, NZ (with honours); *BCom* in statistics, economics and finance from Auckland, NZ (A+ ave). Prizes include the "Senior Prize in Statistics" and the "Futures & Options Exchange Prize" for research.
- Professional qualifications include: Chartered Statistician (*CStat*); Fellow of the Royal Statistical Society; Chartered Alternative Investment Analyst (*CAIA*); and committee member of the Statistics and the Law Section at the Royal Statistical Society.
- High school: first overall in New Zealand for computer science and first within attended school for each subject taken; Deputy Head Boy and Student Representative on the Board of Trustees; and two colours for sport.

2.3 Data Science skills

- Language-agnostic programming for statistical analysis (R/Python/Matlab).
- Database development and SQL for very large data sets.
- Automation of links between data-feed APIs (including C++) and legacy databases.

3 Academic Output

3.1 Conference presentations

1. *Chair and organizer of a session on Agricultural Statistics.* Upcoming 2023 Royal Statistical Society International Conference, Harrogate, UK.
2. *Invited speaker for a session on Statistics and the Law.* Upcoming 2023 Royal Statistical Society International Conference, Harrogate, UK.
3. *Using Efron's Optimism to select the best models for soil resilience, when data sets are of limited size.* 2022 Royal Statistical Society International Conference, Aberdeen, UK.
4. *Past convictions and the probability of guilt.* The 2022 World Meeting of the International Society of Bayesian Analysis (ISBA), Montreal, Canada.
5. *Finite-Sample Bias in Pseudo-Out-of-Sample Testing and Cross-Validation.* 2019 Royal Statistical Society International Conference, Belfast, UK.
6. *Probability reasoning in judicial fact-finding and the probative value of previous convictions.* 2019 Royal Statistical Society International Conference, Belfast, UK.
7. *The Bias in Pseudo-Out-of-Sample-Testing.* Invited speaker, 2019, Econometrics & Applied Economics Seminar, Melbourne University.
8. *The Bias in Pseudo-Out-of-Sample-Testing.* Invited speaker, 2019, EBS Seminar, Monash University, Australia.
9. *More p-values please, not fewer (invited speaker).* 2015 Royal Statistical Society International Conference, Exeter, UK.
10. *Statistical deduction vis-à-vis induction.* 2013 Royal Statistical Society International Conference, Newcastle, UK.
11. *On the future of Fisherian hypothesis testing.* 2012 Royal Statistical Society International Conference, Telford, UK.
12. *On criminal identification with statistical models.* 2012 Royal Statistical Society International Conference, Telford, UK.
13. *Extending the confusion of Simpson's Paradox (with reference to a generalised paradox of evidence).* 2012 International Classification Society (annual conference), Tilburg, Netherlands.

14. *On the problems of multiple hypothesis testing (philosophical attempts to combat multiplicity).* 2011 International Workshop on Hypothesis Testing, Madrid, Spain.

15. *On econometric inference and investment returns (with reference to multiple hypotheses).* 2011 Econometric Society (Europe) Annual Meeting, Norway.

16. *On logistic regression and hierarchical Bayesian models (with reference to the applicability of model results to individuals).* 2011 American Sociological Association Statistical Methodology Conference, Tilburg, Netherlands.

17. *Statistical discovery in finance, with reference to Maurice Kendall and Paul Samuelson (invited speaker).* 2010 Royal Statistical Society International Conference, UK.

18. *On recidivism modelling.* 2010 Australian Statistical Society International Conference, Perth, Australia.

19. *Why statisticians shouldn't "do" inference.* 2009 Royal Statistical Society 175th Anniversary Conference, Edinburgh, UK.

3.2 Peer-reviewed publications

The quality of the journal (e.g. Q1 means top quartile, according to Clarivate impact factors or Scopus rankings) and the contribution made by Ian Hunt (IH) are indicated after each paper.

1. Walker, B., S. Powell, I. Hunt, C. Wilson, R. Doyle, and R. Tegg (2023). Ten years of green manuring and biofumigation alters soil characteristics and microbiota. *Applied Soil Ecology (accepted).*
   Journal quality: Impact Factor 5.509; Q1 in Ecology and Q1 in Soil Science IH contribution: Developed a novel breakdown of PCO analysis for microbial communities that isolates treatment effects within a data set dominated by spatial and time dependence.

2. Sarkar, D., I. Hunt, C. Macdonald, B. Wang, J. Bowman, and M. Tamplin (2023). Modelling growth of bacillus cereus in paneer by one-step parameter estimation. *Food Microbiology (accepted).*
   Journal quality: Impact Factor 6.374; Q1 in Food Science and Q1 in Microbiology. One of two leading journals for predictive microbiology. IH contribution: Developed and applied an algorithm that combines multiple models, estimating all parameters in one optimisation step. The paper also introduces to the predictive microbiology literature a bootstrapping procedure to validly gauge the sampling variance of one-step model parameter estimates.

3. Hunt, I. (2022a). A critique of the literature on past convictions and the probability of guilt. *Law, Probability and Risk 20*, 1–30.
   Journal quality: Q1 in Law and Q1 in Philosophy (Scopus) and Q1/Q2 in Mathematics. The top journal in its sub-discipline, published by Oxford University Press. IH contribution: Sole author of manuscript that critiques likelihood-based analyses and offers several novel Bayesian approaches to modelling and understanding past conviction evidence.

4. Kapoor, M., I. Hunt, J. Spillane, L. J. Bonnett, E. J. Hutton, J. McFadyen, J.-P. Westwood, M. P. Lunn, A. S. Carr, and M. M. Reilly (2022). IVIg-exposure and thromboembolic event risk: findings from the UK Biobank. *Journal of Neurology, Neurosurgery & Psychiatry*.
   Journal quality: Q1 in Clincal Neurology & Psychiatry, and Q1 in Surgery (Impact Factor 10.284). One of the premier journals in medicine generally, published by the British Medical Journal. IH contribution: Large-scale database investigation, data set splitting decisions and subsequent development of *conditional* prediction models. Bootstrapping and simulations for logistic regression assessment and related measures of predictive success.

5. Hunt, I. (2022c). In-sample tests of predictability are superior to pseudo-out-of-sample tests, even when data mining. *International Journal of Forecasting 38*(3), 872–877.
   Journal quality: Q1 in Economics and Q1 in Management (Impact Factor 3.779) and the leading journal in the sub-discipline of forecasting. IH contribution: Sole author of manuscript that identifies a major logical and practical flaw with out-of-sample testing and cross-validation.

6. Hunt, I. (2022b). Ian Hunt's contribution to the Discussion of 'Assumption-lean inference for generalised linear model parameters'. *Journal of the Royal Statistical Society: Series B (Statistical Methodology) 84*, 711–712
   Journal quality: Q1 in Statistics & Probability and one of the leading journals in statistics. IH contribution: Invited and peer-reviewed discussion.

7. Sidhu, R. S., S. A. Bound, and I. Hunt (2022). Crop load and thinning methods impact yield, nutrient content, fruit quality, and physiological disorders in Scilate apples. *Agronomy 12*(9), 1–9
   Journal quality: Q1 in Agronomy and Q1 in Plant Sciences (Impact Factor 3.94). IH contribution: Dimension reduction and model development of approximately fifty different crop and plant nutrient measurements, over two seasons and six different treatments.

8. Field, L., L. M. Hemsworth, E. Jongman, I. Hunt, and M. Verdon (2023). Observations on the effects of non-maternal adult contact on the behavioural patterns of pre-weaned dairy heifers. *Animal Production Science 63*(7), 652–663.
   Journal quality: Q2 in Animal Science and Q2 in Food Science (the leading journal in its field within Australasia). IH contribution: Straight-forward data analysis and ANOVA modeling, trading off complexity with the acknowledgment of a small sample size (many cows but few true 'replicates').

9. Walker, B. A., S. M. Powell, R. S. Tegg, R. B. Doyle, I. G. Hunt, and C. R. Wilson (2022). Soil microbial community dynamics during ryegrass green manuring and brassica biofumigation. *Applied Soil Ecology 179*, 104600
   Journal quality: Impact Factor 5.51, Q1 in Ecology and Q1 in Soil Science. IH contribution: Complete revision of statistical methodology after a very critical first review (of a manuscript IH was not involved in). Revisions included accounting for the repeated measures nature of intra-plot replications and running *valid* ANOSIM hypothesis tests to detect differences in microbial populations.

10. Manik, S. N., M. Quamruzzaman, M. Livermore, C. Zhao, P. Johnson, I. Hunt, S. Shabala, and M. Zhou (2022, apr). Impacts of barley root cortical aerenchyma on growth, physiology, yield components, and grain quality under field waterlogging conditions. *Field Crops Research 279*, 108461
    Journal quality: Q1 in Agronomy (Impact Factor 5.224) and ranked *number one* out of 123 journals by its citation indicator. IH contribution: ANCOVA and regression modelling, with careful handling of imperfect control samples (caused by the necessary set-up of the fields). Re-writing of the text and analysis from scratch (from before the involvement of IH), avoiding a second rejection from the premier journal in its field.

11. Muleke, A., M. T. Harrison, P. de Voil, I. Hunt, K. Liu, M. Yanotti, and R. Eisner (2022, mar). Earlier crop flowering caused by global warming alleviated by irrigation. *Environmental Research Letters 17*(4), 044032
    Journal quality: Q1 in Environmental Sciences (Impact Factor 6.800). IH contribution: Modeling interpretation and presentation, identification of one of the two key findings.

12. Manik, S. M. N., M. Quamruzzaman, C. Zhao, P. Johnson, I. Hunt, S. Shabala, and M. Zhou (2022, mar). Genome-wide association study reveals marker trait associations (MTA) for waterlogging-triggered adventitious roots and aerenchyma formation in barley. *International Journal of Molecular Sciences 23*(6), 3341
    Journal quality: Q1 in Biochemistry and Molecular Biology (Impact Factor 5.924). IH contribution: Development of, and full responsibility for, genome-wide association study methodology. Primary responsibility for satisfying the demands from two difficult rounds of reviews.

13. Langworthy, A., I. Hunt, J. Foley, and J. Hills (2022). Summer growth, nutritive value and marginal irrigation responses of a modern summer-active cocksfoot (dactylis glomerata l.) ecotype relative to perennial ryegrass (lolium perenne l.). *Proceedings of the Australasian Dairy Science Symposium*.
Journal quality: Proceedings of the premier conference in its field within Australasia. IH contribution: Straight-forward data analysis and ANOVA modeling, focusing on expressing 'model interactions' in a clear and valid fashion.

14. D'Costa, I., I. Hunt, L. Russell, and K. Adams (2022). A racial bias test with tertiary cancer centre employees: why anti-racist measures are required for First Nations Australians' cancer care equity. *Australian Health Review*.
Journal quality: Q3 in the global Health Care Sciences category (Impact Factor 1.990), but has a very high *practical* impact within Australia (the target of our research). IH contribution: ANOVA analysis and bootstrap confidence intervals on quantile measurements.

15. Stone, C. H., D. C. Close, S. A. Bound, and I. Hunt (2022, mar). Training systems for sweet cherry: Light relations, fruit yield and quality. *Agronomy 12*(3), 643.
Journal quality: Q1 in Agronomy and Q1 in Plant Sciences (Impact Factor 3.94). IH contribution: ANOVA analysis, model selection and assessment criteria.

16. Hirth, M. J., I. Hunt, K. Briody, Z. Milner, K. Sleep, A. Chu, E. Donovan, and L. O'Brien (2021). Comparison of two relative motion extension approaches (rme with versus without an additional overnight orthosis) following zones v-vi extensor tendon repairs: A randomized equivalence trial. *Journal of Hand Therapy*, 1–15.
Journal quality: Q2 in Surgery (Impact Factor 1.95) but a leading specialist journal in the sub-discipline of occupational therapy. IH contribution: Design and analysis of an array of linear mixed models, along with post-hoc power simulations (which ensured publication in this leading journal).

17. Chung, J., M. E. Mundy, I. Hunt, A. Coxon, K. R. Dyer, and S. McKenzie (2021, oct). An evaluation of an online brief mindfulness-based intervention in higher education: A pilot conducted at an Australian university and a British university. *Frontiers in Psychology 12*.
Journal quality: Q2 in Psychology (Impact Factor 2.988). IH contribution: Model exploration and assessment, and key data sub-setting decisions.

18. Kargupta, W., C. Browne, L. Verdugo, I. Hunt, K. Stack, W. Batchelor, and J. Tanner (2021). Flotation as a separation technology for recovering pulp fines and sustainable nanocellulose production. *Separation and Purification Technology 270*, 118810.
Journal quality: Q1 in Chemical Engineering (Impact Factor 7.312). IH contribution: Design and analysis of ANOVA models for incomplete factorial design experiments (refocusing co-authors' attention to the most relevant *subset* of the data).

19. Hunt, I. and J. Mostyn (2020). Probability reasoning in judicial fact-finding. *The International Journal of Evidence & Proof 24*(1), 75–94.
Journal quality: Q1 in Law and a leading journal in the sub-discipline of evidence. IH contribution: Leading the drafting and ideas for the entire manuscript, whilst working in conjunction with a UK High Court judge who gave the judgement on which the paper is controversially based.

20. Hunt, I. (2018). A discussion on 'Statistical challenges of administrative and transaction data' by Hand, D. *Journal of the Royal Statistical Society: Series A (Statistics in Society) 181*(3), 591
Journal quality: Q1 in Statistics & Probability. IH contribution: Invited and peer-reviewed discussion.

21. Hunt, I. (2013). A discussion on 'A Bayesian approach to complex clinical diagnoses: a case-study in child abuse' by Best et al. *Journal of the Royal Statistical Society: Series A (Statistics in Society) 176*(1), 86–87
Journal quality: Q1 in Statistics & Probability. IH contribution: Invited and peer-reviewed discussion.

22. Hunt, I. (2012a). A discussion on 'Quantifying the weight of evidence from a forensic fingerprint comparison: a new paradigm' by Neumann et al. *Journal of the Royal Statistical Society: Series A (Statistics in Society) 175*(2), 400
Journal quality: Q1 in Statistics & Probability. IH contribution: Invited and peer-reviewed discussion.

23. Hunt, I. (2012b). A discussion on 'Statistical methods for healthcare regulation: rating, screening and surveillance' by Spiegelhalter et al. *Journal of the Royal Statistical Society: Series A (Statistics in Society) 175*(1), 27
Journal quality: Q1 in Statistics & Probability. IH contribution: Invited and peer-reviewed discussion.

24. Hunt, I. (2011). A discussion on 'Resource allocation models' by Galbraith and Stone. *Journal of the Royal Statistical Society. Series A (Statistics in Society) 174*, 551–552
Journal quality: Q1 in Statistics & Probability. IH contribution: Invited and peer-reviewed discussion.

3.3 Papers submitted and under review at peer-reviewed journals

1. Das, B., S. Schmidt, M. Harrison, I. Hunt, J. Biggs, and N. Huth (2023). Key drivers of phosphorus use efficiency (PUE) in a dryland cropping system. *Agronomy for Sustainable Development (under submission)*.
Journal quality: Impact Factor 7.832. A leading journal in its field published by the French National Institute for Agriculture, Food and Environment (INRAE). IH contribution: Deconstructed an obscure methodology of estimating parameter 'importance' in large scale simulation studies and validated a complex sampling plan for crop simulation scenarios. Reconstructed a simpler and more informative set of 'parameter effects' and interactions.

2. Dilena, E., I. Hunt, D. Close, and S. Garland (2023). Nitrogen nutrition, not pruning or water deficit, affects yield in medicinal cannabis. *Industrial Crops and Products (under submission)*, 1–15.
Journal quality: Impact Factor 6.449; Q1 in Agricultural Engineering and Q1 in Agronomy. IH contribution: Explored a principled set of ANCOVA models in order to recover clear 'treatment effects' from a noisy data set (the yield measurements were multi-dimensional and affected by a hidden nuisance factor that related to varying light exposure on the sample units).

3.4 Working papers and industry reports

Ian has more than ten working papers in the field of agriculture, of which several are in the last stages of preparation for submission to peer-reviewed journals. His current work includes research related to: predictive microbiology, nitrogen trials for cannabis, water-stress trials on pasture crops, fruit browning, regional influences on cider quality, soil microbial analysis, soil organic carbon testing, bee flight behaviour and dairy cow welfare.

Ian has co-authored or contributed to a wide variety of detailed industry reports in agriculture. Significant co-authorship works include those from the following applications: the use of hemp for animal nutrition; the effect of composting additives on soil microbial community compositions and fruit tree yield; and a comprehensive survey of the botanical composition of pasture. Several peer-reviewed academic publications are expected to follow from these reports, pending funding-body permissions.

3.5 Supervision

At the University of Tasmania, Ian has two PhD students for whom he is the primary supervisor. One project is on processing and modelling electronic soil sensor data. The other project is on modelling

cow health using modern sensor data.

Ian is also a co-supervisor for one PhD student working on commercial cannabinoid production and another working on soil compaction.

Furthermore, in his role as a consulting statistician at Monash University and the University of Tasmania, Ian has directly assisted, on a one-to-one basis, the empirical work of more than two hundred PhD candidates and academic researchers.

3.6 Successful funding applications

At the University of Tasmania, Ian is a member of five teams of people who have successfully applied for and secured significant research grants. First, a project funded by the Australian Soil CRC (to approximately AUD500,000) that is investigating electronic sensors in soil, with a commercialization goal. Secondly, a project to investigate new dairy pasture options that, among other things, can reduce Nitrogen fertilizer dependence — part of the multi-million dollar industry-funded "Dairy High 2" project. Thirdly, a project funded by the Tasmanian state government (to approximately AUD500,000) that is investigating feeding cows biochar and seaweed as a means to reduce methane emissions. Fourthly, a project called "Integrated pest management approaches to address pest challenges in raspberry and blackberry" which has funding in excess of AUD1.5 million. Fifthly, a project worth AUD400,00 to investigate how "virtual fences" (electric collars) affect dairy cow welfare in pasture settings.

In addition to those large-scale projects, Ian has also directly secured AUD5,000 funding from the J M Roberts Seed Funding Trust and AUD15,000 from an ag-development research hub. This money is part of the operating budget for his upcoming work with his PhD students.

Ian has also contributed to many funding application *processes* in a consulting capacity (in which he is not a "key researcher" on the grant). His contributions have included statistical analysis plans, power calculations, ethics approval analysis (for human trials and animal model experiments) and clinical trial protocol development.

References

Chung, J., M. E. Mundy, I. Hunt, A. Coxon, K. R. Dyer, and S. McKenzie (2021, oct). An evaluation of an online brief mindfulness-based intervention in higher education: A pilot conducted at an Australian university and a British university. *Frontiers in Psychology 12*.

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Hunt, I. (2022a). A critique of the literature on past convictions and the probability of guilt. *Law, Probability and Risk 20*, 1–30.

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