HANNAH COMISKEY
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Overview

I am an applied statistician specializing in the development of statistical models for time-dependent, compositional, and spatial data. My research focuses on creating models that effectively analyse these complex datasets. Previously, I developed statistical indicators using family planning and agronomic data. My expertise lies in Bayesian modelling techniques, which leverage hierarchical structures to facilitate information exchange across populations, quantify parameter uncertainty, and integrate prior knowledge into statistical frameworks. Currently, I am a Postdoctoral Research Fellow in the Department of Econometrics and Business Statistics at Monash University, Melbourne, Australia. My work here involves applying Bayesian statistical models to forecast reconciliation for compositional data. I completed my PhD at Maynooth University under the supervision of Prof. Niamh Cahill, supported by the SFI Centre for Research Training in Foundations of Data Science. During this time, I also led an undergraduate statistics module at Trinity College Dublin and tutored undergraduate and postgraduate statistics courses, both online and in person. In addition to my academic experience, I have an extensive background in teaching mathematics. For eight years, I tutored second-level mathematics to Junior and Leaving Certificate students at both higher and ordinary levels. I have also earned a Professional Certificate in Teaching and Learning from Maynooth University. Before pursuing my PhD, I worked as an analyst in the Data Analytics department at EY Dublin.

Research Interests

Statistical modelling, time-series analysis, spatial analysis, Bayesian analysis, family planning, agronomy, statistical demography, statistical ecology.

Research Experience and Professional Development

- Presented nationally and internationally on the statistical analysis of family planning indicators.
- Presented nationally and internationally on the statistical analysis of spatial and temporal trends in multi-species grassland mixtures.
- Written internal reports on the application of my research to family planning indicators for the Track20 Project, a team implemented by Avenir Health, who monitor the progress towards achieving the goals of the global FP2030 initiative.
- Regular contributor to the Family Planning Research Group, an international collaboration of researchers and industry interested in developing statistical models and tools to assess family planning indicators.
- Contributions to the LegacyNet project, an international network of grassland experiments.
- Completed a 3-month international placement to University of Massachusetts, Amherst, USA under the supervision of Professor Leontine Alkema.
- Research featured as part of the Hamilton Institute showcase to the Maynooth University president, Professor Eeva Leinonen and Vice-president for Research and Innovation, Professor Rachel Msetfi.
- Completed a Bayesian Data Analysis course run by Assoc. Prof Aki Vehtari in May 2021 with an overall grade of 89.6%.
- Achieved the grade A1 in two modules, '*Introduction to Scientific Computing'* and '*Introduction to Deep Learning and Frameworks'*, from the masters in Artificial Intelligence provided by the University of Limerick
- Completed a 3-day workshop on R-INLA as part of the Valencia International Bayesian Analysis Summer School, VIBASS5 2022.
- Completed four intensive courses at the Academy for PhD Training in Statistics (APTS), 2020.

- Experienced with numerous Statistical programs such as R, Minitab, Python, and Bayesian computing programs such as JAGs, STAN and WinBUGs.

Education, Professional Certifications & Employment

2023-2024: Postdoctoral Research Fellow, Department of Computer Science and Statistics, Trinity College, Dublin, Ireland.

2019-2023: Ph.D. Statistics, Maynooth University, Ireland.

2021-2023: Assistant copy editor, The R journal.

2020-2022: Statistics tutor, Maynooth University, Ireland.

2020: 3-month industry placement with the Data Science & AI department of Novartis, Ireland.

2020: Maynooth University, Professional Certificate in Postgraduate Teaching & Learning: Tutors and Demonstrators.

2018-2019: Analyst, Data Analytics department, EY, Dublin.

2014-2018: Maynooth University, Bachelor of Science in Biology and Statistics, 1st Class Honours.

Teaching Experience

2023-2024: Supervisor for PhD mini projects, Trinity College Dublin.
- Involved in the supervision of five first and second year PhD mini projects over a 12 week semester. This involved weekly meetings, supervision of the statistical analysis and preparation for an internal research symposium.

2023-2024: Lecturer for Statistical Analysis I, Trinity College Dublin.
- Involved writing and providing lectures, online assessment materials and examinations for an undergraduate level course on statistical analysis.

2020-2022: Statistics tutor, Maynooth University.
- I was the primary tutor for the non-parametric statistics, data analysis and Bayesian analysis courses. I assisted in the facilitation of Data Analytics Master's thesis projects in 2021.

2015-: Junior and Leaving certificate mathematics tutor.
- I am an experienced mathematics tutor for second level students at both higher- and ordinary-levels.

Achievements

- Member of the LegacyNet Conference organizing committee 2024.
- Research Student's Conference in Probability and Statistics (RSC) 2021 award for "*Best Talk of the RSC 2021 Conference*"
- Represented the SFI Centre for Research Training in Foundations of Data Science in an advertising campaign for future students and industry partners.
- Member of the SFI CRT Foundations of Data Science Winter Symposium organizing committee 2021
- Awarded a four-year Ph.D. research position in the SFI Centre for Research Training in Foundations of Data Science.

Peer-reviewed publications and software

Published articles

- Journal of the Royal Statistical Society, Series A: Statistics in Society.
  Comiskey, H., Alkema, L. and Cahill, N., 2024. Estimating the proportion of modern contraceptives supplied by the public and private sectors using a Bayesian hierarchical penalized spline model. arXiv preprint arXiv:2212.03844.
- Accepted, pending publication with R Journal:
  Comiskey, H. and Cahill, N., 2023. mcmsupply: An R Package for Estimating Contraceptive Method Market Supply Shares. arXiv preprint arXiv:2308.09434.

Conference Papers

- Population Association of America Annual Meeting, 2022. **Comiskey, H.,** Alkema, L. and Cahill, N., 2022. Estimating the proportion of modern contraceptives supplied by the public and private sectors using a Bayesian hierarchical penalized spline model.

Software

- **Comiskey, H.,** Alkema, L. and Cahill, N., 2023. The mcmsupply, R package. Found at: https://cran.r-project.org/web/packages/mcmsupply/index.html

Conference Presentations

- Identifying the drivers of functional group and species-level dynamics over time in an international multi-site grassland experiment (invited speaker). LegacyNet International Conference, Ireland, 2024.
- Evaluating the impact of using annual private sector adjustment factors in the calculation of estimated modern use (oral). Family Planning Research group, USA. 2023.
- Subnational estimation of contraceptive method supplies (invited speaker). Y-ISA annual meeting, Ireland. 2022.
- Estimating the proportion of modern contraceptives supplied by the public and private sectors using a Bayesian hierarchical penalised spline model (oral). Royal Statistical Society International Conference, UK. 2022.
- Estimating the proportion of modern contraceptives supplied by the public and private sectors using a Bayesian hierarchical penalised spline model (oral). Research Student's Conference in Probability and Statistics Conference, UK. 2022.
- Estimating the proportion of modern contraceptives supplied by the public and private sectors using a Bayesian hierarchical penalised spline model (oral). Population Association of America Annual Meeting, USA. 2022.
- Estimating the proportion of modern contraceptives supplied by the public and private sectors using a Bayesian hierarchical penalised spline model (oral). Conference of Applied Statistics in Ireland, Ireland. 2022.

References

Professor Niamh Cahill

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Professor Caroline Brophy

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