

NATALIE KARAVARSAMIS, PHD

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SUMMARY OF EXPERIENCE

7 years **Academic/Lecturer**; 20+ years **Consultant**; 20+ years **Research Scientist**; 20+ years **Software Developer & Computer Programmer**; 30 years **Educator**.

ACADEMIC, RESEARCH, INDUSTRY & CONSULTING POSITIONS

- 2023–current **Professional consultant**, Statistics and Data Science..
- 2023–current **Professional development**, *Deep Learning Course*, Coursera, Deep Learning: AI, neural networks, machine learning, computer vision, natural language programming.
- 2022 **Overseas sabbatical**.
- 2018–2021 **Lecturer and Researcher**, Department of Mathematics and Statistics, La Trobe University.
Collaborators: Prof. Annapurna Poduri (Harvard University, USA), Prof. Florence Forbes (INRIA, Grenoble, France), Dr Hien Nguyen (La Trobe University), Prof. Richard Huggins (University of Melbourne), Dr Gurutzeta Guillera-Arroita (University of Melbourne), Prof. Byron Morgan (University of Kent), Ass. Prof. Ray Watson (University of Melbourne).
- 2016–2021 **Honorary Research Fellow**, School of Mathematics and Statistics, University of Melbourne.
Collaborators: Prof. Richard Huggins, Dr Gurutzeta Guillera-Arroita, Prof. Byron Morgan (University of Kent), Ass. Prof. Ray Watson.
- 2016–2017 **Lecturer and Researcher**, School of Mathematics and Statistics, University of Melbourne, Australia..
- 2016–2017 **Postdoctoral Research Fellow**, School of Biosciences, University of Melbourne, Australia..
Project title: How can the score test be consistent?
- 2001–2017 **Teaching Assistant (Tutor)**, School of Mathematics and Statistics, University of Melbourne.
- 1998–2017 **Private Tutor**.
 - 2015 **Postdoctoral Research Fellow**, School of Mathematical and Geospatial Sciences, RMIT University.
Project title: New statistical approaches for analysing species distributions
- 2009–2014 **PhD candidate**, School of Mathematics and Statistics, University of Melbourne.
- 2009–2012 **Statistical & Consultant**, Parks Victoria, Melbourne.
- 2008 **Research Fellow**, School of Food and Land Sciences, University of Melbourne, Deakin University.
- 2004–2007 **Biometrician/Statistical & Consultant, Industry Research Collaborator, Supervisor**, Department of Primary Industries, Victorian State Government, Australia.
 - 2004 **Statistical Consultant: Biosecurity Risk Analysis of Importation of Apples from New Zealand**, Department of Primary Industries, Victorian State Government, Australia.
- 2001–2003 **Biostatistician/Epidemiologist/Statistical Consultant, Researcher, Coder**, Cancer Epidemiology Centre, Cancer Council of Victoria, Australia..
 - 2000 **Honours Candidate in Statistics**, School of Mathematics and Statistics, University of Melbourne, Australia..
 - 2000 **Research Assistant**, Statistical Consulting Centre, School of Mathematics and Statistics.
University of Melbourne, Australia.
 - 1999 **Research Assistant**, School of Medicine, University of Crete, Greece.
 - 1998 **Private Tutor**, *Australia and Greece*.

EDUCATION

- 2009–2014 **Ph.D. in Statistics**, School of Mathematics and Statistics, University of Melbourne, Australia.
Thesis: Methods for estimating occupancy.
Supervisors: Prof. Richard Huggins, A/Prof. Ray Watson, Ass. Prof. Andrew Robinson and Ass. Prof. Graham Hepworth.
- 2000 **B.Sc. Honours degree in Statistics - 1st Class Honours**, School of Mathematics and Statistics, University of Melbourne, Australia.
Thesis: Methods of Meta-Analysis.
Supervisors: Dr Ken Sharpe and Ass. Prof. Ian Gordon.
- 1996 **B.Sc. in Statistics and Operations Research**, School of Mathematics and Statistics, University of Melbourne, Australia.

INDUSTRY PROJECTS

- 2009–2010 **Project Leader and Chief Statistician (UoM)**. Project: Fox Control Program in Victoria. Stakeholders: Parks Victoria, School of Mathematics and Statistics (University of Melbourne (UoM), Australia). Funding: PhD Scholarship, Stipend from Parks Victoria.
- 2008 **Project Leader and Chief Statistician**. Project: Estimating Annual probability of infection for quantitative microbial risk assessment. Stakeholders: ARC Industry Linkage Grant, Melbourne School of Land and Environment (University of Melbourne (UoM)). Funding: ARC Industry Linkage Grant.
- 2006–2007 **Project Co-Leader and Chief Statistician (Department of Primary Industries)**. Project: Validating the yield performance of alternatives to methyl bromide for pre-plant fumigation. Stakeholders: TEAP and UNEP, Department of Primary Industries.
- 2003–2005 **Chief Investigator and Chief Statistician (Department of Primary Industries)**. Project: Reducing Spoilage and Contamination Risks of Fresh Vegetables in China and Australia, Chinese Collaboration. Stakeholders: China, Department of Primary Industries.
- 2004–2005 **Chief Investigator and Chief Statistician (Department of Primary Industries)**. Project: National (Australian) Industry potato grower Project. Stakeholders: McCains, Department of Primary Industries.
- 2004 **Chief Investigator and Chief Statistician (Department of Primary Industries)**. Project: Importation Risk Analysis for Apples from New Zealand. Stakeholders: Australian Government, Department of Primary Industries.
- 2001–2003 **Senior Investigator and Senior Statistician (Cancer Council of Victoria)**. Project: Melbourne Collaborative Cohort Study (MCCS), commenced 1990. Stakeholders: University of Melbourne, State Government of Victoria, Cancer Council of Victoria.
- 2001–2003 **Senior Investigator and Senior Statistician (Cancer Council of Victoria)**. Project: Eating Patterns and Food Consumption Survey and Methods Development, MCCS. Stakeholders: University of Melbourne, State Government of Victoria, Cancer Council of Victoria
- 2001–2003 **Project Leader, Chief Statistician and Chief Programmer (Cancer Council of Victoria)**. Project: Nutrient Analysis Methods Development and Testing. Software testing (Visual Basic- VBA) and software development in STATA. Stakeholders: Commercial product, Cancer Council of Victoria.
- 1999 **Chief Statistician (University of Crete)**. Project: European Union Seven Countries Study. Stakeholders: European Union, University of Crete (School of Medicine, Greece).

ACADEMIC SERVICE

- 2018 Vice Chancellor's Luncheon, La Trobe University
- Editorial & Peer Reviewer
- 2018–2021 Technical Sub-Editor, Australian and New Zealand Journal of Statistics (Wiley)
- 2020–2021 Biometrics (Wiley)
- 2020–2021 Journal of Agricultural, Biological, and Environmental Statistics (JABE) (Springer Nature)
- 2019 Reviewer and co-editor of proceedings papers of RSSDS 2019 (Research School on Statistics and Data Science 2019), Springer Communications in Computer and Information Science
- 2019–2021 PhD thesis examiner
- 2018–2021 Journal of Pediatric Rehabilitation Medicine (IOS Press)
- 2018–2021 Austral Ecology, A Journal of ecology in the Southern Hemisphere, Ecological Society of Australia (Wiley)
- Roles
- 2019–2021 Bachelor of Science Course Advisor, Department of Mathematics and Statistics, La Trobe University
- 2018–2021 Higher Degree Thesis Reviewer, Department of Mathematics and Statistics, La Trobe University

COMMITTEE SERVICE

- 2019–2020 Local Organising Committee, International Statistical Ecology Conference (ISEC2020), University of New South Wales, Sydney, Australia, June 22–26, 2020.
- 2019–2020 Program Chair, Research School on Statistics and Data Science (RSSDS2019), La Trobe University, July 24–26, 2019 (<https://sites.google.com/view/rssds2019>).
- 2019 Committee Member, Women in Mathematics Day, La Trobe University, joint WIMISG event in honour of Maryam Mirzakhani the first female Fields Medallist.
- 2019 Committee Member, Choose Maths Day, La Trobe University, in collaboration with Australian Mathematical Sciences Institute (AMSI).
- 2018 Founder and Administrator, Statistics Journal Club, Department of Mathematics and Statistics, La Trobe University.

- 2018–2020 Reviewer, International PhD Applicants, Department Mathematics and Statistics, La Trobe University.
- 2017 Committee Member & Organisator, Mathematics & Statistics Female Academics & PhD Mentoring Program, University of Melbourne.
- 2014–2017 Member, Equity Plenary Committee, University of Melbourne.
- 2010 Committee, 2010 Victorian Mathematics and Statistics Student Conference, School of Mathematics and Statistics, of Melbourne Melbourne.
- 2009–2012 Journal Club organiser and presenter, School of Mathematics and Statistics, University of Melbourne.
- 2003–2005 Founder, Committee Member and Administrator, Young Statisticians of Statistical Society Australia (SSA), Victoria, Australia.

PROFESSIONAL SERVICE & OUTREACH

- 2019 Invited Speaker, Subject Selection Fair 2019, La Trobe University, Melbourne, Australia
- 2019 Q&A Panel Member, Women in Mathematics Day, La Trobe University, joint WIMISG event in honour of Maryam Mirzakhani the first female Fields Medallist
- 2018 Chair, Statistics Session, AMSI Summer Scholar Conference, Melbourne University
- 2018 Invited Speaker, Australian Mathematical Sciences Institute (AMSI) Choose Maths Day, La Trobe University
- 2018 Discussion Panel Member, AMSI Choose Maths, La Trobe University
- 2018 Ambassador, Mathematics & Statistics Education at La Trobe University, 55th Annual Conference, Mathematical Association of Victoria, La Trobe University
- 2018 Ambassador, Open Day activities, Department of Mathematics and Statistics, La Trobe University
- 2018 Invitee, Vice Chancellor's Luncheon, La Trobe University
- 2017 Mentor, Mathematics & Statistics Female PhD & Academic Mentoring Program
- 2009–2012 Ambassador, Open Day activities, Department of Mathematics and Statistics, Melbourne University
- 2012 Invited teacher, Year 9 Mathematics Class
- 2009–2014 Mentor, International Students, University of Melbourne
- 2007 Volunteer Tutor, Hanover Center, Melbourne, Australia
- 2001–2017 Tutor at the First-Year Learning Centre, Department of Mathematics, University of Melbourne
- 2001– Member, Statistical Society of Australia

GRANTS, AWARDS AND FUNDING

- 2019–2020 Discovery Early Career Researcher Award (DECRA), Fellowship Support Program, La Trobe University, Australia
- 2019 Finalist, Fulbright Scholarship. Collaboration with Boston Children's Hospital and Department of Neuroscience at Harvard University (USA)
- 2019 Travel Grant, Department Mathematics and Statistics, La Trobe University. AUD \$7000
- 2018 Australian-French Association for Research and Innovation (AFRAN). AUD \$3000
- 2016–2018 Early Career Establishment Grant, School of Mathematics and Statistics, University of Melbourne. AUD \$6000
- 2015 Ph.D. Write Up Grant, University of Melbourne. AUD \$6000
- 2009–2014 Ph.D. Scholarship, University of Melbourne. AUD \$23,000 per annum
- 2010–2012 Ph.D. Stipend, Fox Control Program, Parks Victoria. AUD \$10,000 per annum
- 2010 Melbourne abroad travelling scholarships (MATS), School of Mathematics and Statistics, University of Melbourne. AUD \$15,000
- 2010 The Overseas Research Student Belz Award Scheme. School of Mathematics and Statistics, The University of Melbourne. AUD \$15,000
- 2009 Travel Award, School of Mathematics and Statistics, University of Melbourne. AUD \$10,000
- 2008 Conference funding, Department of Land and Food Sciences, University of Melbourne. AUD \$5000
- 2005 Denise Lievesley Young Statisticians Award, Statistical Society of Australia. Full funding for International Statistical Institute (ISI) conference.
- 2004 Travel Award, International Biometrics (IBC) and Australasian Statistical (ASC) conference, Department of Primary Industries. AUD \$7000
- 2001 Travel Award, Australasian Epidemiological Association (AEA) and Biostatistics Conference, Cancer Epidemiology Centre (CEC), Cancer Council of Victoria. AUD \$6000

SUPERVISION

- 2019–2021 Co-supervisor to two PhD Candidates, Department of Mathematics and Statistics, La Trobe University
- 2018 Supervisor to two AMSI Summer Scholarships, Department of Mathematics and Statistics, La Trobe University
- 2004–2005 Supervisor to two Research Assistants, Department of Primary Industries

SOFTWARE

Software programmer and developer for commercial industry and academic research. Expert coder and software developer in R, R-Shiny, Mathematica, Matlab, Maple, Genstat, Stata, Excel macros/add-ons at-Risk, VBA, C++, Ruby for Github, HTML, Javascript, SQL, SPSS, Minitab, all MS products, Adobe Acrobat/Photoshop, Latex/Beamer/Overleaf, Unix/Linux (command line tools, shell scripting).

TEACHING

LECTURER AND COORDINATOR

- 2020 **STA3BS**, *Biostatistics*, 3rd year Undergraduate, Department of Mathematics and Statistics.
La Trobe University
- 2019 **STM3EPS**, *Engineering Probability and Statistics*, 3rd year Undergraduate, Department of Mathematics and Statistics, Department of Engineering.
La Trobe University
- 2018–2020 **STA3AS**, *Applied Statistics*, 3rd year Undergraduate & 4th year Honours, Advanced statistical methods, Department of Mathematics and Statistics.
La Trobe University
- 2018–2020 **STA2ASM**, *Applied Statistical Methods*, 2nd year Undergraduate, Department of Mathematics and Statistics.
La Trobe University
- 2018 **STA3LM**, *Linear Models*, 3rd year Undergraduate, Advanced statistical methods, Department of Mathematics and Statistics.
La Trobe University
- 2016–2017 **MAST90044**, *Thinking and Reasoning with Data*, Masters & Postgraduate, School of Mathematics and Statistics.
University of Melbourne

TEACHING ASSISTANT

- 2010–2017 **Statistics for Research Workers**, Postgraduate and Professional level. Intensive 6-day short course, Statistical Consulting Centre, School of Mathematics and Statistics.
University of Melbourne
- 2009 **Critical Thinking with Data**, 1st year Undergraduate, School of Mathematics and Statistics.
University of Melbourne
- 2008–2017 **MAST10010**, *Data Analysis*, 1st year Undergraduate, School of Mathematics and Statistics.
University of Melbourne
- 2008 **Experimental Design and Data Analysis for Biomedical Science**, 1st year Undergraduate, School of Mathematics and Statistics.
University of Melbourne
- 2007, 2008 **Applied Statistics**, 2nd year Undergraduate, School of Mathematics and Statistics.
University of Melbourne
- 2007, 2008 **Experimental Design/Statistical Methods**, 2nd year Undergraduate, School of Mathematics and Statistics.
University of Melbourne
- 2001–2017 **MAST10011**, *Experimental Design and Data Analysis*, 1st year Undergraduate, School of Mathematics and Statistics.
University of Melbourne

OTHER ACTIVITIES & ACHIEVEMENTS

- 2020 Philosophy Short Course, University of Melbourne
- 2011 **Karavarsamis, N.** Concept, Executive Producer and Dancer. *Dance Class*. Contemporary dance performance for 16 dancers with 6 choreographers. 1 year development from concept to performance. Gasworks Theatre Melbourne. Australia.

PUBLICATIONS

1. Makdissi, R., Atkins, Z.S., Clemann, N., **Karavarsamis, N.** and Robert, K.A.. A skink in grasshopper's clothing: utilisation of Bayesian mimicry in juvenile Guthega skinks as an antipredator defence (*under review*).
2. **Karavarsamis, N.**, Guillera-Aroita, G., Huggins, R.M. and Morgan, B. (2020). How can the score test be consistent?. *Australian and New Zealand Journal of Statistics*, 62(1):94–115. doi.org/10.1111/anzs.12288.
3. **Karavarsamis, N.** (2019). Estimating Occupancy and Fitting Models with the Two-Stage Approach. H. Nguyen (Ed.): Research School of Statistics and Data Science, RSSDS 2019, Communications in Computer and Information Science (CCIS) vol. 1150, pp. 68–80, 2019. Springer Nature Singapore Pte Ltd. doi.org/10.1007/978-981-15-1960-4_5
4. **Karavarsamis, N.** and Huggins, R.M. (2019). A two-stage approach to the analysis of occupancy data I. The Homogeneous case. *Communications in Statistics - Theory and Methods*. doi.org/10.1080/03610926.2019.1607385.
5. **Karavarsamis, N.** and Huggins, R.M. (2019). A two-stage approach to the analysis of occupancy data II. The Heterogeneous case. *Computational Statistics and Data Analysis*, 133:195–207. doi.org/10.1016/j.csda.2018.09.009.
6. Bagnall, J., Jones A., **Karavarsamis, N.** and Nguyen H. (2019). The Fully-Visible Boltzmann Machine and the Senate of the 45th Australian Parliament in 2016. *Journal of Computational Social Science*. <https://dx.doi.org/10.2139/ssrn.3287903>.
7. **Karavarsamis, N.** (2015). Methods for Estimating Occupancy. PhD thesis.
8. Mara, D., Hamilton, A.J., Sleight, A., **Karavarsamis, N.**, Razak Seidu. (2015). Tools for Risk Analysis: Updating the 2006 Guidelines. Wastewater Irrigation and Health. Earthscan.
9. **Karavarsamis, N.**, Robinson, A. P., Hepworth, G., Hamilton, A.J. and Heard, G.W. (2013). Comparison of four bootstrap-based interval estimators of species occupancy and detection probabilities. *Australian and New Zealand Journal of Statistics*, 55(3):235–252.
10. Kreidl, S., Holmes, R., Partington, D., **Karavarsamis, N.** (2012). The effect of calcium and nitrogen nutrition on the development of postharvest rots in pak choi. *Acta horticulture*, 944:73–82.
11. Mara, D., Hamilton, A.J., Sleight, A., **Karavarsamis, N.** (2011). Tools for risk assessment: updating the 2006 WHO guidelines. *Wastewater irrigation and health: Assessing and mitigating risk in low-income countries*. Earthscan, IDRC and IWMI. Editors: P. Drechsel and C.H.Scott and L. Easchild-Sally ajnd M. Redwood and A. Bahri (89–100).
12. **Karavarsamis, N.** and Hamilton, A.J. (2010). Estimators of Annual Probability of Infection for quantitative microbial risk assessment. *Journal of Water and Health*, 8(2):365–373.
13. **Karavarsamis, N.** (2010). Safeguarding our species. *The Age; The Voice*, June, 6(6). <http://voice.unimelb.edu.au/volume-6/number-6/safeguarding-our-species>.
14. Mara D, Hamilton AJ, Sleight A, **Karavarsamis N.**, Seidu R. (2009). Tools for risk analysis: Updating the 2006 WHO guidelines. In Wastewater Irrigation and Health: Assessing and Mitigating Risk in Low-income Countries. 89-100. (Book Chapter).
15. **Karavarsamis, N.**, and Hamilton, A.(2008). Estimators of Annual Probability of Infection. Australian Statistical Conference (ASC2008), Australian Mathematical Sciences Institute (AMSI) and Statistical Society of Australia Inc. (SSAI).
16. Porter, I.J., Trinder, L., Partington, D., Banks, J., Smith, S., Hannah, M., **Karavarsamis, N.** (2006). Special report validating the yield performance of alternatives to Methyl Bromide for pre-plant fumigation. *TEAP/MBTOC Special Report, UNEP Nairobi*.
17. **Karavarsamis, N.** (2005). Control of downy mildew of grapevines by boosting their natural defence system, Final Report to Grape and Wine Research and Development Corporation 2004 – 2005.
18. **Karavarsamis, N.** (2004). Reducing Spoilage and Contamination Risks of Fresh Vegetables in China and Australia, Chinese Collaboration.
19. **Karavarsamis, N.** (2004). Submission (to Australian Government) for the Revised Draft Import Risk Analysis Report for Apples from New Zealand.
20. Giles, G., English, D., **Karavarsamis, N.**, Thursfield, V. (2003). Cancer Survival in Victoria – Relative survival for selected cancers diagnosed from 1982 to 1997 with follow-up to 2000. *Cancer Council Monographs*.
21. **Karavarsamis, N.** (2003). Survival in women in the Victorian breast survey management cohorts: 1986-1995. *Cancer Council Monographs*.
22. **Karavarsamis, N.** (2003). Nutrient Analysis Software – Stata language. Commercial Release of Software.
23. Roberts, S., **Karavarsamis, N.**, English, D., Giles, G. (2001). Hepatocellular carcinoma in Victoria Australia: survival and prognostic factors. 53rd Annual Meeting of the Association for the Study of Liver Diseases (AASLD), Boston, Massachusetts. *Hepatology*. (Conference proceedings)