MADAWA JAYAWARDANA

Email: Madawa.Jayawardana@petermac.org
Mobile: +61 424 855 304

EDUCATION

2015 PhD in Statistics
Department of Statistics, Macquarie University, Australia
Thesis title: *The Cross-Entropy Method and Multiple Change-Point Detection in Genomic Sequences.*

2010 – 2011 Postgraduate studies in Statistics
Department of Mathematics and Statistics, Missouri University of Science and Technology, USA
1 year Masters GPA 4.0/4.0

2005 - 2009 B.Sc. (Hons) 1st Class
Department of Statistics, University of Colombo, Sri Lanka
Thesis title: *Long Term Dependencies and Long Run Non-Periodic Co-Cycles among Major Oil Indices: A Fractional Time Series Approach.*

WORK EXPERIENCE

September 2019 - to date Statistical Consultant
Office of Cancer Research, Peter MacCallum Cancer Centre, Melbourne

My primary role as a statistical consultant to embed myself within various different research groups in order to understand, consult and help direct any statistical analyses. Additionally, I'm responsible in formulation and delivery of training seminars and workshops designed to upskill and empower our researchers in statistics. I work collaboratively with Peter Mac researchers on publications and grant applications to help ensure the quality of their statistical analysis is of a high standard.

July 2015 - August 2019 Lecturer in Applied Statistics
Department of Statistics, Data Science and Epidemiology, Swinburne University of Technology, Melbourne

Leadership roles:
Deputy Director of the Postgraduate Applied Statistics program from 2016.

I have been working as the Deputy Director of the postgraduate applied statistics program since 2016. I have actively contributed to the application of successful re-accreditation of our program from 2017-2022. Further, I have initiated a successful partnership with SAS Inc. (Australia) to obtain accreditation to offer joint certification programs to both master and diploma postgraduate programs. Swinburne University of Technology is one of the few universities in Australia that provides a joint certification program with SAS. I continually work with the other staff members with unit improvement and delivery and also participate in marketing events for our program.

Student supervisions:

I currently supervise two PhD students as an associate supervisor (*project 1 title: Innovative Statistical Methods to Evaluate and Model Corporate Physical Activity Programs: The Virgin Pulse 100 Day Program*, and *Project 2 title: Statistical Modelling and Analysis of Persistence of Threatened Birds in Australia*). The former PhD project was resulted through a grant that I submitted to the Early Career Researcher PhD Scholarship program at the Swinburne University of Technology together with Prof. Denny Meyer. I have also supervised two successful master's projects with titles "*Collaborative Filtering Methods for Recommending Merchants to Bank Customers*" & "*Asthma Presentations and Thunderstorm: A Detailed Analysis of Meteorological Factors".* Further, I have supervised two students with summer internship program with the titles of the projects (*Analysing disease outbreaks using Google trend data, a web-*

based tool for real time surveillance: A case study on Dengue outbreak in Sri Lanka. and *Analysing expenditure patterns and trends of the Australian Medicare Benefits schedule (MBS): A case study of Psychological service*)

Unit/Course Developments:

I have successfully developed three units (two postgraduate and one undergraduate unit) including all the administrative tasks to obtain necessary accreditation for the units.

- STA30005 (Multivariate Analysis - undergraduate, Convener & Lecturer) - I have designed the unit and developed the content related to multivariate statistical methods. This unit is taught in R.
- STA70003 (Further Statistical Computing using SAS - postgraduate, Convener & Lecturer) - Unit was completely redesigned and developed to include new content and to align with the SAS joint certification requirements.
- STA60003 (Basic Statistical Computing using R - postgraduate, Convener & Lecturer) – I have designed and developed the material for this unit with another academic staff member.
- STA70002 (Multivariate Statistics – Postgraduate, Lecturer/convener) – I have contributed to the development of new content into this postgraduate unit, which is being taught in R and SPSS.
- I am also convening and lecturing short courses: STAA0005A: Multiple Linear and Logistic Regression, STAA0005B: Factor Analysis and MANOVA, STAA0006A: Introduction to SAS and STAA0006B: Intermediate SAS.

May - June 2015 Research Associate - Biostatistician
Research unit for Schizophrenia Epidemiology, School of Psychiatry, University of New South Wales Medicine, Sydney.

- Coordinate allocated section of the overall research project -the NSW-CDS- with a particular focus on the prevalence and correlates of behavioural problems among children born to parents with and without criminal offending histories and on the intergenerational transmission of antisocial behaviours.
- Contribute to project knowledge dissemination via conference presentations, publications, and training activities.
- Conduct sophisticated statistical analyses and provide a high level of statistical data management and records.
- Provide statistical support for other staff in their analysis as required.
- Contribute to the design, planning and writing of scientific publications & manuscripts and dissemination materials from this particular project.

2012 - 2015 Tutor
Department of Statistics, Macquarie University, Sydney.
Responsible for carrying out tutoring, lab sessions and grading of the following units.

- STAT 830 - Prelude to Bioinformatics (Postgraduate unit, software - R)
- ACST 601 - Stochastic Methods in Finance and Insurance (Postgraduate unit, software - R)
- STAT 328/ STAT 826 - Market Research and Forecasting (Undergraduate/ Postgraduate unit, software - SPSS)
- STAT 306/806 – Statistical Inference (Undergraduate/ Postgraduate unit)
- HLTH 306 - Research Methods for Health Sciences (Undergraduate unit, software - MINITAB)
- STAT 270/ STAT 680 – Applied Statistics (Undergraduate/ Postgraduate unit, software - MINITAB)
- STAT 272 – Probability (Undergraduate unit)
- STAT 273/ STAT 683 – Introduction to probability and statistics (Undergraduate/ Postgraduate unit)
- STAT 170 - Introductory Statistics (Undergraduate unit, software - MINITAB)

Aug-Dec 2011 **Research Assistant**
Department of Statistics, Macquarie University.
Supervisor: Dr. Georgy Sofronov

2010 - 2011 **Graduate Assistant**
Department of Mathematics & Statistics, Missouri University of Science and Technology, USA

2010 - 2011 **Statistical Consultant**
Department of Mathematics & Statistics, Missouri University of Science and Technology, USA
Research Project: *Relationship between Cooperative education and early employment outcomes.*

Collaborator: Dr. Edna Grover-Bisker, Assistant Vice Chancellor for Student Affairs, Missouri University of Science & Technology, USA.

2009 - 2010 **Quantitative Analyst**
Amba Research Lanka Pvt. Ltd., Sri Lanka.

COMPUTING SKILLS

- Proficient in the R statistical software. I am the author and the maintainer of the R package "breakpoint", which is built to detect multiple change-points in continuous and count data sequences.
  URL: http://cran.r-project.org/web/packages/breakpoint/index.html
- Experienced with SAS, SPSS and MINITAB statistical software.
- Familiar with Stata and EViews statistical software.
- Proficient with: LATEX, MS Word, MS Excel, PowerPoint and Keynote.

AWARDS

2016 Vice-Chancellor's Teaching Excellence Award (Team Member) for outstanding commitment and dedication to teaching excellence in Higher Education, Swinburne University of Technology.

2012 Award for excellence in postgraduate research in Statistics or Econometrics at the J.B. Douglas Postgraduate Award Ceremony (2012), The Statistical Society of Australia Inc.

2011 Award of international Macquarie University Research Excellence (iMQRES) scholarship to peruse PhD in Statistics at the Macquarie University, Sydney.

2010 2nd Runner up - "Best undergraduate Research Projects in Statistics - 2010" organized by the Applied Statistics Association of Sri Lanka in parallel to the International Statistics Conference, Colombo, Sri Lanka.

PUBLICATIONS AND PRESENTATIONS

Refereed Book Chapter

- **Priyadarshana, W. J. R. M.**, Polushina, T., and Sofronov, G. (2015). *Hybrid algorithms for multiple change-point detection in biological sequences*, In Sun, C., Bednarz, T., Pham, T., Vallotton, P., and Wang, D., (Eds.), Signal and Image Analysis for Biomedical and Life Sciences, volume 823 of Advances in Experimental Medicine and Biology. Springer International Publishing.
  http://link.springer.com/chapter/10.1007%2F978-3-319-10984-8_3

Refereed Journal Articles

- Ray, U., Bank, S., **Jayawardana, M. W.**, Bhowmik, J., Redwig, F., Jana, P., Bhattacharya, S., Manna, E., Kumar, S.D., Maiti, S., Roberts-Thomson, P., Parameswaran, V., & Sinha, A.K. (2019). *Insulin resistance in prostate cancer patients and predisposing them to acute ischemic heart disease*. Bioscience Reports, 39:7, 10.1042/BSR20182313.

- Muir, S. D., Silva, S. S. M., Rider, H. J., Woldegiorgis, M.A., Meyer, D. & **Jayawardana, M. W.** (2019). *Predictors of successful of workplace physical activity interventions: A systematic review.* Journal of Physical Activity and Health, 16:8, 647-656.

- Meyer, D.; **Jayawardana, M. W.**; Muir, Samuel D.; Ho, David Yen-The; Sackett, Olivia (2019). *Increasing awareness of the importance of physical activity and a healthy nutrition: results from a mixed methods evaluation of a workplace program*, Journal of Physical Activity and Health, 16:4, 259-266.

- Silva, S. S. M., **Jayawardana, M. W.**, & Meyer, D. (2018). *Statistical methods to model and evaluate physical activity programs, using step counts: A systematic review*, PLOS ONE, Vol. 13, no. 11, e02067863.

- Meyer, D., **Jayawardana, M. W.**, Muir, Samuel D., Ho, David Yen-The, & Sackett, Olivia (2018). *Promoting psychological wellbeing at work by reducing stress and improving sleep: results from a mixed methods analysis*, Journal of Medical Internet Research, 20(10), e267.

- **Priyadarshana W. J. R. M.**, & Sofronov G. (2015). *Multiple Break-Points Detection in array CGH Data via the Cross-Entropy Method*, IEEE/ACM Transactions on Computational Biology and Bioinformatics, vol. 12, no. 2, pp. 487-498. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6917020

Refereed Full Conference Papers

- Meyer, D., **Jayawar, Madawa W.**, & Silva, Sandun (2018). *Statistical modelling with missing data in eHealth databases*, Proceedings of the 33rd International Workshop on Statistical Modelling, Bristol, United Kingdom, 16-20 July 2018, pp. 107-112

- Meyer, D., Muir, Samuel, **Weerasinghe Jayawardana, M.,** Ho, David, Sackett, Olivia (2017). *Evaluation of a corporate physical activity program using mixed methods*, Proceedings of the MathSport International 2017 Conference, University of Padua, Padua, Italy, 26-28 June 2017, pp. 275-289.

- Sofronov, G.Y., Polushina, T.V. and **Jayawardana, M.W.** (2017). *An Improved Hybrid Algorithm for Multiple Change-Point Detection in Array CGH Data*. In Proc. of the 22nd International Congress on Modelling and Simulation. Modelling and Simulation Society of Australia and New Zealand, December 2017, pp. 508-514. ISBN: 978-0-9872143-7-9.

- **Priyadarshana W. J. R. M.**, Polushina T., Sofronov G. (2013). *A Hybrid Algorithm for Multiple Change-Point Detection in Continuous Measurements*, In Proc. of the International Symposium on Computational Models for Life Sciences, AIP Conference Proceedings, vol. 1559, pp. 108–117, ISBN 978-07-35411-87-6.

- **Priyadarshana W. J. R. M.**, & Sofronov G. (2013). *GAMLSS and Extended Cross-Entropy Method to Detect Multiple Change-Points in DNA Read Count* Data, In: Muggeo VMR, Capursi V, Boscaino G, Lovison G (Eds.), Proc. of the 28th International Workshop on Statistical Modelling, vol. 1, 453-457, ISBN 978-88-96251-47-8.

- **Priyadarshana W. J. R. M.**, & Sofronov G. (2012). *A Modified Cross-Entropy Method for Detecting Change-Points in the Sri-Lankan Stock Market*, In: B. M. Chen, M. T. Khan, K-K. Tan (Eds.), Proc. of the IASTED International Conference on Engineering and Applied Science, 321-326, doi: 10.2316/P.2012.785-041.

- **Priyadarshana W. J. R. M.**, & Sofronov G. (2012). *The Cross-Entropy Method and Multiple Change-Points*

Detection in Zero-Inflated DNA read count data, In: Y. T. Gu, S. C. Saha (Eds.), Proc. of the 4th International Conference on Computational Methods, 1-8, ISBN 978-1-921897-54-2.

- Sofronov G., Polushina T., **Priyadarshana W. J. R. M.** (2012). *Sequential Change-Point Detection via the Cross-Entropy Method*, In Proc. of the 11th Symposium on Neural Network Applications in Electrical Engineering, 185-188, doi: 10.1109/NEUREL.2012.6420004.
- **Priyadarshana W. J. R. M.**, & Sofronov G. (2012). *A Modified Cross-Entropy Method for Detecting Multiple Change-Points in DNA Count Data*, In Proc. of the IEEE Conference on Evolutionary Computation (CEC), 1020-1027, doi 10.1109/CEC.2012.6256470.
- **Priyadarshana W. J. R. M.**, & Tilakaratne C. D. (2010). *A Fractional ARIMA Model for Daily Spot Crude Oil Prices of the Organization of Petroleum Exporting Countries (OPEC)*, In Proc. of the International Statistics Conference, vol. 10, 203-216, ISSN 1391-4987.
- **Priyadarshana W. J. R. M.**, & Tilakaratne C. D. (2010). *Long Term Co-dependencies and Long Run Non-periodic Co-cycles among Major Oil Indices: A Fractional Time Series Approach*, In Proc. of the International Statistics Conference, vol. 10, 217-227, ISSN 1391-4987.

Conference/Research Presentations

- *Application of the Cross-Entropy method and multiple change-point detection for epidemiological data.* **Joint Statistical Society for Clinical Biostatistics and Australian Statistical Conference, Melbourne, Australia, 2018.**
- *An improved hybrid algorithm for multiple change-points detection in array CGH data.* **International Congress on Modelling and Simulation (MODSIM 2017), Hobart, Tasmania, 2017.**
- *The Cross-Entropy Method and Multiple Change-Point Detection in Biological Sequences.* **Swinburne Celebrate Research Conference, Melbourne, Australia, 2017.**
- *breakpoint: an R package to Detect Multiple Change-Points in Continuous and Count Data via the Cross-Entropy Method,* **The Asian Mathematical Conference (AMC 2016), Bali, Indonesia, 2016.**
- *Multiple Break-Points Detection in Biological Sequences via the Cross-entropy Method*, **Australian Statistical Conference in conjunction with the IMS Annual meeting (ASC-IMS), Sydney, Australia, 2014.**
- *A hybrid algorithm for multiple change-point detection in continuous measurements*, **International Symposium on Computational Models for Life Sciences, Sydney, Australia, 2013.**
- *GAMLSS and Extended Cross-Entropy Method to Detect Multiple Change-Points in DNA Read Count Data*, **28th International Workshop on Statistical Modelling, Palermo, Italy, 2013.**
- *An Extended Cross-Entropy Method for Detection of Copy Number Variations in Biological Sequences,* **26th European Conference on Operational Research, Rome, Italy, 2013.**
- *Detection of Copy Number Variation in Next Generation Sequencing Data via the Cross-Entropy Method,* **Young Statisticians Conference, Melbourne, Australia, 2013.**
- *A Modified Cross-Entropy Method for Detecting Change-Points in the Sri-Lankan Stock Market*, **The IASTED International Conference on Engineering and Applied Science, Colombo, Sri Lanka, 2012.**
- *The Cross-Entropy Method and Multiple Change-Points Detection in Zero-Inflated DNA read count data*, **The 4th International Conference on Computational Methods, Gold Coast, Australia, 2012.**
- *A Modified Cross-Entropy Method for Detecting Multiple Change-Points in DNA Count Data*, **IEEE Conference on Computational Intelligence, Brisbane, Australia, 2012.**
- *A Fractional ARIMA Model for Daily Spot Crude Oil Prices of the Organization of Petroleum Exporting Countries (OPEC),* **International Statistics Conference, Colombo, Sri Lanka, 2010.**

Papers under-review/ in preparation

- Ma, L.; Wishart, J.R.; **Jayawardana, M. W.,** Sofronov, G.; Change point detection in time series process via the Cross-Entropy method. *Annals of Operations Research*, status: submitted (Q2 journal)
- Silva, S.S.M.; Meyer, D.; **Jayawardana, M.W**; Detecting possible cheaters in a physical activity program using the step entries: including a web-based application for outlier detection and decision making. *Biometrical Journal*, status: round 2 revision (Q2 journal)
- **Jayawardana M.W.;** Usman, F.; Sultana R,; McKenzie D,; Hudson IL,; Asthma Presentations and Thunderstorm: Detailed Analysis of Meteorological Factors: a multivariate time series approach. (in preparation)
- Sofronov, G.; **Jayawardana, M.W.**; A Weighted Cross-Entropy Method. (in preparation)
- Kularatne, T. D.; Sofronov, G.; Hudson, I. L.; **Jayawardana, M.W.**; A Cross-Entropy Method for an Optimal Stopping Problem. (in preparation)
- **Jayawardana, M.W**.; Sofronov, G.; breakpoint: An R package for detection of multiple change-points using the Cross-Entropy method. (in preparation)
- O'neill, L.; Bhowmik, J.; Apputhurai, P.; **Jayawardana, M.W.**; Analysing expenditure patterns and trends of the Australian Medicare Benefits Schedule (MBS). (in preparation)
- McNeill, D.; Karapetis, C.S.: Price, T.J.; Meagher, P.; Piantadosi, C.; **Jayawardana, M.W.;** Quinn, S.; Roder, D.; Padbury, R.; Maddern, G.; Townsend, A.; Roy, A.C.; Treatment and outcomes of metastatic colorectal cancer patients in public and private hospitals: Results from the South Australian Metastatic Colorectal Cancer Registry. (in preparation)

GRANTS

2018 SWAN support for academic carers program. AU $2975.

2016 Evaluation and validation of modern variable devices equipped with photodiode heart rate monitors. (Medibio Ltd. AU $30,000). Role: Chief investigator (Experiment design and statistical analysis)

Research Development Grant Scheme (RDGS 2016), Swinburne University of Technology. Role: Chief investigator

- To study the insulin resistance among patients with cerebrovascular strokes. (AU $3000)
- Innovative application of statistical methods within the GCC 100 Day Journey. (AU $3000)

2013 Travel grant to attend the 28th International Workshop on Statistical Modelling, Palermo, Italy from the Statistical Modelling Society (800 EUR).

Recipient of the Macquarie University postgraduate research fund (PGRF) to participate two conferences in Italy (AU $5000).

Travel grant to attend Young Statisticians Conference, Melbourne from The Statistical Society of Australia Inc. - New South Wales Branch (AU $500).

2012 Travel grant to attend the Winter School in Mathematical & Computational Biology, Brisbane from the Bioplatforms Australia and EMBL Australia (AU $250).

2011 Travel grant to attend BioInfoSummer, Melbourne from the Australian Mathematical Sciences Institute (AU $750).

POSTGRADUATE AND UNDERGRADUATE SUPERVISION

- 06/2017 – present, Sandun Silva, *Innovative Statistical Methods to Evaluate and Model Corporate Physical Activity Programs.* Associate supervisor – PhD.

- 01/2019 – present, Udani Wijewardhana, *Statistical Modelling and Analysis of Persistence of Threatened Birds in Australia.* Co-supervisor – PhD.

- 12/2018 – present, Lachlan O'Neill, *Analysing expenditure patterns and trends of the Australian Medicare Benefits schedule (MBS): A case study of Psychological services.* – Summer internship (undergraduate).

- 12/2017 – 02/2018, Pavel Lukacho, *Analysing disease outbreaks using Google trend data, a web-based tool for real time surveillance: A case study on Dengue outbreak in Sri Lanka.* Joint supervision with Prof. Irene Hudson – Summer internship (undergraduate).

- 2017 – Farha Usman, *Asthma presentations and thunderstorm: A detailed analysis of meteorological factors. Primary Supervisor – Master of Applied Statistics*

- *2016* – Cameron Mence, *Collaborative filtering methods for recommending merchants to bank customers. Primary Supervisor – Master of Applied Statistics*

CONFERENCES AND WORKSHOPS ATTENDED

- The 59th World Statistics Congress (WSC), Hong Kong, 2013.
- Workshop on "Techniques for Advanced R Programming", Statistical Society of Australia, 2013.
- Workshop on "Introduction to UNIX and HPC", Macquarie University, Australia, 2013.
- 10th annual Australian Mathematical Sciences Institute (AMSI) summer school, The University of New South Wales, Australia, 2012.
- Winter school in Mathematical and Computational Biology, The University of Queensland, Australia, 2012.
- BioInfoSummer, The Walter and Eliza Hall Institute (WEHI), Melbourne, Australia, 2011.

PROFESSIONAL MEMBERSHIPS AND SERVICES

2018 to date	**Regular Member,** The Statistical Society of Australia
2010 to date	**Life Member**, Institute of Applied Statistics Sri Lanka.
2017	**Grant evaluation panel member,** Swinburne Research Institutes Seed Grants.
	Associate Editor, Sri Lankan Journal of Applied Statistics.
2016	**Session Chair,** The Asian Mathematical Conference (AMC 2016), Bali, Indonesia
Referee service	PLOS One, BMC Health Services Research, Epidemiological Methods, Sri Lankan Journal of Applied Statistics

REFERENCES

Available upon request.