Lyron Winderbaum

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Highly qualified **Statistician** and **Bioinformatician** with extensive experience in machine learning and reproducible reporting. Academic training in statistics, with an emphasis on classification algorithms in the context of applied biological imaging data. Strong skills in research and programming, with extensive experience using R, LaTeX, and knitr to develop, implement, test, and report on results in a reproducible manner.

Education and Credentials

(The University of Adelaide)

Master of Teaching **Jan 2018 - Present**

Doctor of Philosophy in Statistics **Conferred: Dec 2016**

Thesis: "Statistical Treatment of Proteomic Imaging Mass Spectrometry Data", supervised by Professor Inge Koch and Professor Peter Hoffmann.

Developed, implemented and aided interpretation of results from processing and analysis of data from imaging mass spectrometry experiments. Methods used included principal component analysis, k-means clustering, and discriminant analysis, and broadly fit under the umbrella of machine learning. Datasets related to a variety of contexts but primarily biomedical applications to gynacological cancer treatement. The work done towards this degree involved a significant component of software development in MATLAB and R, and writing in LaTeXusing knitr.

Honours in Statistics **Conferred: Dec 2011**

Thesis: "Multivariate Analysis of Trace Elements in Pyrite", supervised by Associate Professor Andrew Metcalfe, Professor Nigel Cook, and Dr. Cristiana Ciobanu.

Developed methods through collaboration with geochemistry experts to investigate the relationships of interest to them. Methods such as hierarchical agglomerative cluster analysis and bootstrapping were adapted to produce results that were meaningful to the geologists.

Bachelor of Science (Chemistry) **Conferred: Mar 2011**

Bachelor of Computer and Mathematical Sciences (Pure Mathematics and Statistics) **Conferred: Dec 2010**

Additional Qualifications

Understanding Aboriginality Webinar **attended: 10 May 2018**

Keeping Safe: Child Protection Curriculum Training **completed: 19 Apr 2018**

Youth Mental Health First Aid **accredited: 5 Mar 2018**

Literacy and Numeracy Test for Initial Teacher Education Students **standard achieved: 3 Mar 2018**

Responding to Abuse and Neglect Course **completed: 22 Feb 2018**

Department for Communities and Social Inclusion Child-Related Employment Screening **cleared: 16 Jan 2018**

Basic Emergency Life Support (HLTAID002) **accredited: 16 Jun 2017**

Professional Experience

Postdoctoral Research Associate **Jan 2017 - Dec 2017**
(Future Industries Institute, University of South Australia)

Extensive collaboration with experts in different fields and adapting statistical analyses to fullfil their needs. Led and mentored colleagues to implement improved data storage and reporting techniques to ensure a high standard of transparency and accountability. Used high level analytical, research, and communication skills to develop, implement, and report on various multivariate statistical data analyses.

Research Associate **Aug 2015 - Dec 2016**
(Adelaide Proteomics Centre, The University of Adelaide)

Developed and implemented software solutions to improve work efficiency and provide quality assurance to customers. Collaboration with colleagues and experts in different fields, particularly biomedical research, and adaption statistical analyses to different scenarios. Role required high level analytical, research, and communication skills were required in order to develop, implement, and report on various multivariate statistical data analyses.

Tutor **Mar 2012 - Present**
(Maths Learning Centre, The University of Adelaide)

Private Tutor **Mar 2018 - Present**
(sub-contracted through Tutoring for Excellence)

Present complex information to people from a diverse range of backgrounds. Requires a high level of interpersonal skills and the ability to adapt material to different cultures and learning styles. Consulted research students from accross every dicipline in the university on statistical analyses needed for their projects. Delivered the statistics component of third year medical students research methods component. Communicated mathematics and statistics to a wide variety of learners, from year 7 school students to higher degree research students, with adjustments to their individual perspectives and needs.

Tutor **Mar 2012 - July 2015**
(School of Mathematical Sciences, The University of Adelaide)

Experience teaching tutorials, supervising computer practicals, and marking assignments and exams under time-constraints.

Storeperson **Feb 2007 - Feb 2012**
(Coles Supermarkets)

Retail and customer service experience.

Awards

Australian Postgraduate Award Scholarship	Conferred: 2012
The Applied Probability Trust Prize	Conferred: 2011
Australian Bureau of Statistics Scholarship	Conferred: 2008

Programming and Computer Skills

- Extensive experience with MATLAB, LaTeX, and R.
- Familiarity with Python, Java, Golang, C#, Ruby, Perl, Git, and other software such as SAS/ SPSS.

Publications

- Ove JR Gustafsson, Matthew T Briggs, Mark R Condina, Lyron J Winderbaum, Matthias Pelzing, Shaun R McColl, Arun V Everest-Dass, Nicolle H Packer, and Peter Hoffmann. Raw N-glycan mass spectrometry imaging data on formalin-fixed mouse kidney. *Data in Brief*, 21:185, 2018a. doi: https://doi.org/10.1016/j.dib.2018.08.186
- Ove JR Gustafsson, Lyron J Winderbaum, Mark R Condina, Berin A Boughton, Brett R Hamilton, Eivind AB Undheim, Michael Becker, and Peter Hoffmann. Balancing sufficiency and impact in reporting standards for mass spectrometry imaging

experiments. *GigaScience*, 7(10):giy102, October 2018b. URL https://doi.org/10.1093/gigascience/giy102

- G Arentz, P Mittal, C Zhang, Y-Y Ho, M Briggs, L Winderbaum, MK Hoffmann, and P Hoffmann. Applications of mass spectrometry imaging to cancer. In *Advances in cancer research*, volume 134, chapter 2, pages 27–66. Academic Press, 2017. URL https://doi.org/10.1016/bs.acr.2016.11.002

- Parul Mittal, Manuela Klingler-Hoffmann, Georgia Arentz, Lyron Winderbaum, Gurjeet Kaur, Lyndal Anderson, James Scurry, Yee Leung, Colin JR Stewart, Jonathan Carter, et al. Annexin A2 and alpha actinin 4 expression correlates with metastatic potential of primary endometrial cancer. *Biochimica et Biophysica Acta (BBA) - Proteins and Proteomics*, 1865(7):846–857, July 2017. URL https://doi.org/10.1016/j.bbapap.2016.10.010

- Carla M Zammit, Florian Weiland, Joël Brugger, Benjamin Wade, Lyron Juan Winderbaum, Dietrich H Nies, Gordon Southam, Peter Hoffmann, and Frank Reith. Proteomic responses to gold (III)-toxicity in the bacterium *Cupriavidus metallidurans* CH34. *Metallomics*, 8(11):1204–1216, October 2016. URL https://www.doi.org/10.1039/C6MT00142D

- Chao Zhang, Georgia Arentz, Lyron Winderbaum, Noor Lokman, Manuela Klingler-Hoffmann, Parul Mittal, Christopher Carter, Martin Oehler, and Peter Hoffmann. MALDI mass spectrometry imaging reveals decreased CK5 levels in vulvar squamous cell carcinomas compared to the precursor lesion differentiated vulvar intraepithelial neoplasia. *International Journal of Molecular Sciences*, 17(7):1088, July 2016. URL https://doi.org/10.3390/ijms17071088

- Parul Mittal, Manuela Klingler-Hoffmann, Georgia Arentz, Lyron Winderbaum, Noor A Lokman, Chao Zhang, Lyndal Anderson, James Scurry, Yee Leung, Colin JR Stewart, et al. Lymph node metastasis of primary endometrial cancers: associated proteins revealed by MALDI imaging. *Proteomics*, 16(11-12):1793–1801, April 2016. URL https://doi.org/10.1002/pmic.201500455

- Lyron Winderbaum, Inge Koch, Parul Mittal, and Peter Hoffmann. Classification of MALDI-MS imaging data of tissue microarrays using canonical correlation analysis-based variable selection. *Proteomics*, 16(11-12):1731–1735, March 2016. URL https://doi.org/10.1002/pmic.201500451

- Lyron J Winderbaum, Inge Koch, Ove JR Gustafsson, Stephan Meding, Peter Hoffmann, et al. Feature extraction for proteomics imaging mass spectrometry data. *The Annals of Applied Statistics*, 9(4):1973–1996, 2015. URL https://projecteuclid.org/euclid.aoas/1453994187

- Ove JR Gustafsson, Matthew T Briggs, Mark R Condina, Lyron J Winderbaum, Matthias Pelzing, Shaun R McColl, Arun V Everest-Dass, Nicolle H Packer, and Peter Hoffmann. MALDI imaging mass spectrometry of N-linked glycans on formalin-fixed paraffin-embedded murine kidney. *Analytical and Bioanalytical Chemistry*, 407(8):2127–2139, March 2015. URL https://doi.org/10.1007/s00216-014-8293-7

- Lyron Winderbaum, Cristiana L Ciobanu, Nigel J Cook, Matthew Paul, Andrew Metcalfe, and Sarah Gilbert. Multivariate analysis of an LA-ICP-MS trace element dataset for pyrite. *Mathematical Geosciences*, 44(7):823–842, October 2012. URL `https://doi.org/10.1007/s11004-012-9418-1`

Presentations

- Poster Presentation, Australian Proteomics Society Annual Lorne Symposium, 2015
- Oral Presentation, Australian Statistican Conference/ Institute of Mathematical Statistics Annual Meeting, Sydney, 2014
- Oral Presentation, Young Statisticians Conference, Brisbane, 2013

References

Professor Inge Koch
Relation: PhD Supervisor, Collaborator, Colleague
Phone: +61 412 672 852
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Dr. Johan Gustafsson
Relation: Senior Colleague at Future Industries Institute, University of South Australia
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Dr. David Butler
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