

CURRICULUM VITAE – Dr. Boris Beranger

PERSONAL DETAILS

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RESEARCH INTERESTS

My Google scholar profile can be accessed via <http://bit.do/e4pRB>. I have a general interest in Extreme Value Theory, both from a theoretical and methodological perspective. In particular, I am interested in modelling the dependence structure of multivariate and spatial extremes with an emphasis on environmental applications. I also conduct research on big data related problems and have recently developed a framework for statistical analysis based data summaries.

CURRENT POSITIONS

Senior Lecturer UNSW Sydney	2022-
Member of the UNSW Data Science Hub (uDASH) UNSW Sydney	2021-

PAST POSITIONS

Lecturer UNSW Sydney	2020-2022
Associate Investigator ARC Centre of Excellence for Mathematical and Statistical Frontiers	2017-2021
Research Associate UNSW Sydney <i>Supervisor:</i> Prof. Scott Sisson	2016-2019

EDUCATION

Ph.D. in Statistics (under cotutelle) <i>Institutions:</i> Université Pierre and Marie Curie (UPMC), Paris 6 UNSW Sydney <i>Supervisors:</i> Prof. Michel Broniatowski (UPMC) Prof. Scott Sisson (UNSW Sydney) Dr. Simone Padoan (Bocconi University of Milan, Italy) <i>Title:</i> “Modelling the dependence structure of multivariate and spatial extremes”.	2012-2016
Masters of Mathematics (Statistics) <i>Institution:</i> Université Pierre and Marie Curie (UPMC), Paris 6	2009-2011

- [1.] **Beranger, B.**, Lin, H. and Sisson, S. A. (2022) “New models for symbolic data analysis”. *Advances in Data Analysis and Classification (Q1)*, to appear.
- [2.] Rahman, P., **Beranger, B.**, Roughan, M. and Sisson, S. A. (2022) “Likelihood-based inference for modelling packet transit from thinned flow summaries.”. *IEEE Transactions on Signal and Information Processing over Networks*, 8, 571–583.
- [3.] **Beranger, B.**, Stephenson, A. G. and Sisson, S. A. (2021) “High dimensional inference using the extremal skew- t processes”. *Extremes (Q1)*, 24(3), 653–685.
- [4.] **Beranger, B.**, Padoan, S. A. and Sisson, S. A. (2021) “Estimation and uncertainty quantification for extreme quantile regions”. *Extremes (Q1)*, 24(2), 349–375.
- [5.] Whitaker, T., **Beranger, B.** and Sisson, S. A. (2021) “Logistic regression models for aggregated data”. *Journal of Computational and Graphical Statistics (Q1)*, In press.
- [6.] Whitaker, T., **Beranger, B.** and Sisson, S. A. (2020) “Composite likelihood methods for histogram-valued random variables”. *Statistics and Computing (Q1)*, 30, 1459–1477.
- [7.] Zhang, X., **Beranger, B.** and Sisson, S. A. (2019). “Constructing likelihood functions for interval-valued random variables”. *Scandinavian Journal of Statistics (Q1)*, 47(1), 1–35.
- [8.] **Beranger, B.**, Padoan, S. A., Xu, Y. and Sisson, S. A. (2019). “Extremal properties of the multivariate extended skew-normal distribution, Part B”. *Statistics and Probability Letters (Q3)*, 147, 105–114.
- [9.] **Beranger, B.**, Padoan, S. A., Xu, Y. and Sisson, S. A. (2019). “Extremal properties of the univariate extended skew-normal distribution, Part A”. *Statistics and Probability Letters (Q3)*, 147, 73–82.
- [10.] **Beranger, B.**, Duong, T., Perkins-Kirkpatrick, S. and Sisson, S. A. (2019). “Tail density estimation for exploratory data analysis using kernel methods”. *Journal of Nonparametric Statistics (Q2)*, 31(1), pp. 144–174.
- [11.] **Beranger, B.**, Padoan, S. A. and Sisson, S. A. (2017). “Models for extremal dependence derived from skew-symmetric families”. *Scandinavian Journal of Statistics (Q1)*, 44, pp. 21–45.
- [12.] **Beranger, B.** and Padoan, S. A. (2015). “Extreme Dependence Models”, in *Extreme Value Modeling and Risk Analysis: Methods and Applications*, pp. 325–352, Chapman Hall/CRC.

PAPERS IN
PREPARATION

- [13.] **Beranger, B.**, Antoniano-Villalobos, I. and Padoan, S. A. "Prediction of large observations via extreme-value theory and Bayesian nonparametric inference".
- [14.] Brito, P., **Beranger, B.** and Sisson, S. A. "Interval-valued variables and quantile functions".
- [15.] **Beranger, B.**, McGree, J. M. and Sisson, S. A. "Design of interval and histogram random variables".
- [16.] Whitaker, T., **Beranger, B.** and Sisson, S. A. "Estimating equations for data summaries".
- [17.] **Beranger, B.**, Stewart, M. and Sisson, S. A. "Extremal type theorems for mean aggregated data".

GRANTS AND
AWARDS

Discovery Project (DP220103269)	2022
<i>Australian Research Council</i>	
Co-CI with Prof. Scott Sisson.	
Project "New methods for modelling real-world extremes" (\$405,000).	
Research Sprint Scheme	2021
<i>ARC Centre of Excellence for Mathematical and Statistical Frontiers</i>	
Project "New models for the analysis of spatial extremes via max-stable and r -Pareto processes" (\$29,502).	
Research Support Scheme	2021
<i>ARC Centre of Excellence for Mathematical and Statistical Frontiers</i>	
Project "Modelling Environmental and Climate Extremes" (\$14,524).	
Outreach participation award	2019
<i>ARC Centre of Excellence for Mathematical and Statistical Frontiers.</i>	
Award for 'Work experience in Data Science' program ran between 2017 and 2020.	
Research Support Scheme	2018
<i>ARC Centre of Excellence for Mathematical and Statistical Frontiers</i>	
Financial support to establish a collaboration with CSIRO, Data61, Australia (\$7,600).	
J. B. Douglas award	2014
<i>NSW Branch of the Statistical Society of Australia (SSA)</i>	
Award for Postgraduate excellence.	

Ph.D. SUPERVISION	Ahmad Hakiim Jamaluddin , UNSW Sydney <i>Topic:</i> Advances in symbolic data analysis. <i>Joint supervisor:</i> Prof. Scott Sisson.	2021-
	Prosha Rahman , UNSW Sydney <i>Topic:</i> Generalised solutions in symbolic data analysis. <i>Joint supervisor:</i> Prof. Scott Sisson.	2019-
	Thomas Whitaker , UNSW Sydney <i>Topic:</i> Innovative methods for the analysis of complex and non-standard data. <i>Joint supervisor:</i> Prof. Scott Sisson.	2016-2020

MASTER AND HONOURS SUPERVISION	Jaydon Miranda (Honours), UNSW Sydney <i>Topic: TBD.</i>	2023
	Haoyang Wang (Honours, <i>joint supervision</i>), UNSW Sydney <i>Topic: Functional peaks over threshold analysis of temperatures in Northwest NSW.</i>	2022
	Jiasheng Huang (Honours, <i>joint supervision</i>), UNSW Sydney <i>Topic: Maximum Domain of Attraction of the Sinh-Arcsinh distribution.</i>	2022
	Martin Burgess (Masters), UNSW Sydney <i>Topic: TBD.</i>	2022
	Nicholas Graham (Masters), UNSW Sydney <i>Topic: TBD.</i>	2022
	Jianing (Chris) Gu (Masters, <i>joint supervision</i>), UNSW Sydney <i>Topic: Extreme hotspots and anomalies analysis for Red Sea surface temperature using Bayesian methods.</i>	2022
	Jianren Wang (Masters, <i>joint supervision</i>), UNSW Sydney <i>Topic: Semi-supervised self learning in financial data analysis.</i>	2022
	Dajoun Deng (Masters, <i>joint supervision</i>), UNSW Sydney <i>Topic: Modelling margin calls with extreme value theory.</i>	2022
	Chuqin Zhou (Masters), UNSW Sydney <i>Topic: Circulant embedding techniques for modelling of spatial data.</i>	2022
	Jingyi Yang (Masters, <i>joint supervision</i>), UNSW Sydney <i>Topic: Extreme temperature analysis of the red sea surface.</i>	2021
	Weidi Wang (Masters), UNSW Sydney <i>Topic: Construction of proportion confidence intervals for small, finite populations.</i>	2021
	Xin (Joy) Lin (Masters, <i>joint supervision</i>), UNSW Sydney <i>Topic: Modelling of signature and identifying forgery signature by r-Pareto process.</i>	2021
	Yujia He (Masters), UNSW Sydney <i>Topic: Analysis of air quality in the Sydney region using extreme value theory.</i>	2021
	Max Fisher (Honours, <i>joint supervision</i>), UNSW Sydney <i>Topic: Statistical analysis using distribution-valued data.</i>	2019
	Lewis Wright (Honours, <i>joint supervision</i>), UNSW Sydney <i>Topic: Extremal type theorems for symbolic data.</i>	2019
	Bowen Wang (Masters, <i>joint supervision</i>), UNSW Sydney <i>Thesis: "Symbolic data analysis for generalized extreme value model".</i>	2019
	Yangfan Xu (Masters, <i>joint supervision</i>), UNSW Sydney <i>Thesis: "On the extremes of extended skew-normal random variables".</i>	2017

TEACHING
ACTIVITIES

LECTURES:

Applied Regression Analysis (MATH5806) UNSW Sydney, Postgraduate course.	2021-2022
Regression Analysis for Data Scientists (ZZSC5806) UNSW Sydney, Online Postgraduate course.	2021-2022
A Modern Introduction to Extreme Value Theory Australia Mathematical Sciences Institute, Summer School.	2022
Fundamentals of Data Science (DATA9001) UNSW Sydney, Postgraduate course.	2021
Foundations of Data Science (ZZSC9001) UNSW Sydney, Online Postgraduate course.	2020-2021
Introduction to Statistics and Statistical Computing (MATH5856) UNSW Sydney, Postgraduate course.	2019-2020
Statistical Analysis of Dependent Data (MATH3841) UNSW Sydney, Third year course.	2018
Introduction to Statistics Ecole Supérieure d'Ingénieur Leonard de Vinci (Courbevoie, France), First year course.	2014
Introduction to Statistics & Probability Ecole Supérieure des Sciences Commerciales d'Angers, (Boulogne, France), First year course.	2014

TUTORIALS:

Advanced topics in Statistical Machine Learning (COMP9418) UNSW Sydney, Postgraduate course.	2017
Calculus (MATH1131) UNSW Sydney, First year course.	2012, 2015, 2017
Statistics for Life and Social Sciences (MATH1041) UNSW Sydney, First year course.	2015, 2017

INVITED TALKS	International Federation of the Classification Societies, Universidad do Porto (Portugal). "Logistic regression for aggregated data".	2022
	14th International Conference of the ERCIM WG on Computational and Methodological Statistics, <i>Online</i> . "Analysis of extremal behaviour using block sums and averages".	2021
	13th International Conference of the ERCIM WG on Computational and Methodological Statistics, <i>Online</i> . "Estimation and uncertainty quantification for extreme quantile regions".	2020
	New Perspectives in Data Science, In Honor of Edwin Diday's 80th birthday, Institut Henri Poincaré (France). "Estimating equations for data summaries".	2020
	11th International Conference of the ERCIM WG on Computational and Methodological Statistics, University of Pisa (Italy). "Inference for extremal- t and skew- t max-stable models in high dimensions".	2018
	Data science: new data, new paradigms: From data to classes and classes as statistical units, University of Paris Dauphine (France). "Extreme value analysis using symbolic data".	2018
	9th International Conference of the ERCIM WG on Computational and Methodological Statistics, University of Seville (Spain). "On some features of the skewed families of max-stable processes".	2016
	8th International Conference of the ERCIM WG on Computational and Methodological Statistics, Senate House, University of London (UK). "Extremes of Skew-Symmetric distributions".	2015

SEMINARS	One World Extremes seminar – <i>Online</i> “Fitting max-stable processes to high-dimensional data”.	2022
	One World webinar, Young Statisticians Europe – <i>Online</i> “Using symbolic data to understand underlying data behaviour”.	2021
	Statistical and Applied Mathematical Science Institute (USA) – <i>Online</i> “Fitting models to underlying data using aggregates”.	2021
	King Abdullah University of Science and Technology (Saudi Arabia) – <i>Online</i> “High-dimensional inference for max-stable processes”.	2021
	University of Lisbon (Portugal) – <i>Online</i> “High-dimensional inference for max-stable processes”.	2020
	University of Technology Sydney (Australia) – <i>Online</i> “Composite likelihood and logistic regression models for aggregated data”.	2020
	Macquarie University (Australia) “Advances in the analysis of aggregated data”.	2019
	Australian National University (Australia). “New models for symbolic data analysis”.	2019
CONTRIBUTED TALKS	Melbourne University (Australia). “First steps in the analysis of Symbolic Data”.	2017
	Australia New-Zealand Statistical Conference, Gold Coast (Australia) “Estimation and uncertainty quantification for extreme quantile regions”.	2021
	10th Conference on Extreme Value Analysis, TU Delft (Netherlands). “A composite likelihood based approach for max-stable processes using histogram-valued variables”.	2017
	Australian Statistical Conference, Canberra (Australia). “On some features of the skewed families of max-stable processes”.	2016
	9th Conference on Extreme Value Analysis, University of Michigan (USA). “Exploratory data analysis of extreme values using non-parametric kernel methods”.	2015
	Australian Statistical Conference in conjunction with the Institute of Mathematical Statistics Annual Meeting, Sydney (Australia). “Likelihood based estimation method for Extreme dependence models”.	2014

REFEREEING	Journal of Computational and Graphical Statistics (Q1)	
	Journal of Multivariate Analysis (Q1)	
	Extremes (Q1)	
	Annals of Applied Statistics (Q1)	
	Journal of Royal Statistical Society, Series C (Q1)	
	Spatial Statistics (Q1)	
	Statistics and Computing (Q1)	
	Advances in Data Analysis and Classification (Q1)	
	Stochastic Environmental Research and Risk Assessment (Q1)	
	Weather and Climate Extremes (Q1)	
	Stat (Q2)	
	Journal of Agricultural, Biological, and Environmental Statistics (Q2)	
	Statistics (Q2)	
	Dependence Modeling (Q2)	
SOFTWARE	<p>[1.] R package ExtremalDep (Extremal Dependence)</p> <p>Available on CRAN (https://cran.r-project.org/package=ExtremalDep) .</p> <p><i>Description:</i> Provides a set of procedures for modelling parametrically and non-parametrically the dependence structure of multivariate extreme values.</p> <p>The statistical inference is performed with non-parametric estimators, likelihood-based estimators and Bayesian techniques.</p> <p><i>Collaborators:</i> Dr. Giulia Marcon and Dr Simone Padoan.</p> <p><i>Downloads:</i> > 15,000 (Sept 2022).</p>	
	<p>[2.] R package CompRandFld (Composite-Likelihood Based Analysis of Random Fields)</p> <p>Available on CRAN (https://cran.r-project.org/package=CompRandFld) .</p> <p><i>Description:</i> Provides a set of procedures for for the analysis of Random Fields using likelihood and non-standard likelihood methods.</p> <p><i>Collaborators:</i> Dr. Moreno Bevilacqua and Dr Simone Padoan.</p> <p><i>Downloads:</i> > 46,000 (Sept 2022).</p>	
CURRENT RES- -PONSIBILITIES	Statistical Society of Australia, NSW Branch	
	Treasurer	2018-
	Member of the council	2017-
	UNSW Quantitative Data Science Honours	
	Coordinator	2022-

OUTREACH	uDASH Work Experience Program 1-week program involving a dozen of high school students.	2022
	Year 10 Work Experience Program <i>ACEMS initiative with local High Schools</i> 7 day program involving a dozen of high school students.	2017-2019
OTHER	15th International Conference of the ERCIM WG on Computational and Methodological Statistics <i>Scientific Program Committee & Session organiser,</i> King's College, London (UK).	2022
	UNSW Statistics Seminar Series Organiser	2018-2022
	Workshop "Modelling extreme rainfall and floods: sharing perspectives of extreme value theory and climate science" <i>Co-organiser with Dr Kate Saunders (Monash).</i>	2021
	14th International Conference of the ERCIM WG on Computational and Methodological Statistics <i>Session organiser,</i> King's College, London (UK).	2021
	Modelling extreme rainfall and floods: sharing perspectives of extreme value theory and climate science <i>Organising committee member,</i> Online.	2021
	Early Career Researchers Retreat <i>Organising committee member,</i> Gold Coast (Australia) Part of ARC Centre of Excellence for Mathematical and Statistical Frontiers annual retreat.	2017
	Statistics Reading Group <i>Organiser</i> School of Mathematics and Statistics, UNSW Sydney	2016-2018
	Organising committee member <i>1st Annual Postgraduate Conference</i> School of Mathematics and Statistics, UNSW Sydney	2014
REFEREES	Scott Sisson Professor School of Mathematics and Statistics UNSW Sydney Scott.Sisson@unsw.edu.au	Simone Padoan Doctor Department of Decision Sciences Bocconi University of Milan Simone.Padoan@unibocconi.it