CURRICULUM VITAE – Dr. Boris Beranger

PERSONAL DETAILS

Address: School of Mathematics and Statistics
UNSW Sydney
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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

Lecturer 2020-
UNSW Sydney

Associate Investigator 2017-
ARC Centre of Excellence for Mathematical and Statistical Frontiers

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PAST POSITIONS

Research Associate 2016-2019
UNSW Sydney
Supervisor: Prof. Scott Sisson

EDUCATION

Ph.D. in Statistics (under cotutelle) 2012-2016
Institutions: Université Pierre and Marie Curie (UPMC), Paris 6
UNSW Sydney
Supervisors: Prof. Michel Broniatowski (UPMC)
Prof. Scott Sisson (UNSW Sydney)
Dr. Simone Padoan (Bocconi University of Milan, Italy)
Title: "Modelling the dependence structure of multivariate and spatial extremes".

Masters of Mathematics (Statistics) 2009-2011
Institution: Université Pierre and Marie Curie (UPMC), Paris 6

REFEREED PUBLICATIONS

[1.] **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.

[2.] **Beranger, B.**, Padoan, S. A. and Sisson, S. A. (2021) "Estimation and uncertainty quantification for extreme quantile regions". *Extremes* (Q1), 24(2), 349–375.

[3.] Whitaker, T., **Beranger, B.** and Sisson, S. A. (2021) "Logistic regression models for aggregated data". *Journal of Computational and Graphical Statistics* (Q1), In press.

[4.] Whitaker, T., **Beranger, B.** and Sisson, S. A. (2020) "Composite likelihood methods for histogram-valued random variables". *Statistics and Computing* (Q1), 30, 1459–1477.

[5.] 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.

[6.] **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.

[7.] **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.

[8.] **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.

[9.] **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.

[10.] **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.

SUBMITTED PAPERS

[11.] **Beranger, B.**, Lin, H. and Sisson, S. A. "New models for symbolic data analysis".

[12.] Rahman, P., **Beranger, B.**, Roughan, M. and Sisson, S. A. "Likelihood-based inference for modelling packet transit from thinned flow summaries.".

PAPERS IN PREPARATION

[14.] **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

Research Sprint Scheme 2021
ARC Centre of Excellence for Mathematical and Statistical Frontiers
Project "New models for the analysis of spatial extremes via max-stable and r-Pareto processes" ($29,502).

Research Support Scheme 2021
ARC Centre of Excellence for Mathematical and Statistical Frontiers
Project "Modelling Environmental and Climate Extremes" ($14,524).

Outreach participation award 2019
ARC Centre of Excellence for Mathematical and Statistical Frontiers.
Award for 'Work experience in Data Science' program ran between 2017 and 2020.

Research Support Scheme 2018
ARC Centre of Excellence for Mathematical and Statistical Frontiers
Financial support to establish a collaboration with CSIRO, Data61, Australia ($7,600).

J. B. Douglas award 2014
NSW Branch of the Statistical Society of Australia (SSA)
Award for Postgraduate excellence.

Ph.D. SUPERVISION

Ahmad Hakiim Jamaluddin, UNSW Sydney 2021-
Topic: Advances in symbolic data analysis.
Joint supervisor: Prof. Scott Sisson.

Prosha Rahman, UNSW Sydney 2019-
Topic: Generalised solutions in symbolic data analysis.
Joint supervisor: Prof. Scott Sisson.

Thomas Whitaker, UNSW Sydney 2016-2020
Topic: Innovative methods for the analysis of complex and non-standard data.
Joint supervisor: Prof. Scott Sisson.

MASTER AND HONOURS SUPERVISION

Jianing (Chris) Gu (Honours, *joint supervision*), UNSW Sydney 2022
Topic: TBD.

Jaydon Miranda (Honours, *joint supervision*), UNSW Sydney 2022
Topic: TBD.

Haoyang Wang (Honours, *joint supervision*), UNSW Sydney 2022
Topic: TBD.

Jiasheng Huang (Honours, *joint supervision*), UNSW Sydney 2022
Topic: TBD.

Chuqin Zhou (Masters), UNSW Sydney 2022
Topic: TBD.

Jingyi Yang (Masters, *joint supervision*), UNSW Sydney 2021
Topic: Extreme temperature analysis of the red sea surface.

Weidi Wang (Masters), UNSW Sydney 2021
Topic: Construction of proportion confidence intervals for small, finite populations.

Xin (Joy) Lin (Masters, *joint supervision*), UNSW Sydney 2021
Topic: Modelling of signature and identifying forgery signature by r-Pareto process.

Yujia He (Masters), UNSW Sydney 2021
Topic: Analysis of air quality in the Sydney region using extreme value theory.

Max Fisher (Honours, *joint supervision*), UNSW Sydney 2019
Topic: Statistical analysis using distribution-valued data.

Lewis Wright (Honours, *joint supervision*), UNSW Sydney 2019
Topic: Extremal type theorems for symbolic data.

Bowen Wang (Masters, *joint supervision*), UNSW Sydney 2019
Thesis: "Symbolic data analysis for generalized extreme value model".

Yangfan Xu (Masters, *joint supervision*), UNSW Sydney 2017
Thesis: "On the extremes of extended skew-normal random variables".

TEACHING ACTIVITES

LECTURES:

A Modern Introduction to Extreme Value Theory — 2022
Australia Mathematical Sciences Institute, Summer School.

Fundamentals of Data Science (DATA9001) — 2021
UNSW Sydney, Postgraduate courser.

Foundations of Data Science (ZZSC9001) — 2020-2021
UNSW Sydney, Online Postgraduate courser.

Applied Regression Analysis (MATH5806) — 2021
UNSW Sydney, Postgraduate courser.

Regression Analysis for Data Scientists (ZZSC5806) — 2021
UNSW Sydney, Online Postgraduate course.

Introduction to Statistics and Statistical Computing (MATH5856) — 2019-2020
UNSW Sydney, Postgraduate course.

Statistical Analysis of Dependent Data (MATH3841) — 2018
UNSW Sydney, Third year course.

Introduction to Statistics — 2014
Ecole Supérieure d'Ingénieur Leonard de Vinci (Courbevoie, France), First year course.

Introduction to Statistics & Probability — 2014
Ecole Supérieure des Sciences Commerciales d'Angers, (Boulogne, France), First year course.

TUTORIALS:

Advanced topics in Statistical Machine Learning (COMP9418) — 2017
UNSW Sydney, Postgraduate course.

Calculus (MATH1131) — 2012, 2015, 2017
UNSW Sydney, First year course.

Statistics for Life and Social Sciences (MATH1041) — 2015, 2017
UNSW Sydney, First year course.

INVITED TALKS	13th International Conference of the ERCIM WG on Computational and Methodological Statistics, *Online*. "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 weminar, Young Statisticians Europe – *Online* "Using symbolic data to understand underlying data behaviour".	2021
	Statistical and Applied Mathematical Science Institute (USA) – *Online* "Fitting models to underlying data using aggregates".	2021
	King Abdullah University of Science and Technology (Saudi Arabia) – *Online* "High-dimensional inference for max-stable processes".	2021
	University of Lisbon (Portugal) – *Online* "High-dimensional inference for max-stable processes".	2020
	University of Technology Sydney (Australia) – *Online* "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
	Melbourne University (Australia). "First steps in the analysis of Symbolic Data".	2017

CONTRIBUTED TALKS	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

[1.] R package **ExtremalDep** (Extremal Dependence)

Available on CRAN (https://cran.r-project.org/package=ExtremalDep) .

Description: Provides a set of procedures for modelling parametrically and non-parametrically the dependence structure of multivariate extreme values.
The statistical inference is performed with non-parametric estimators, likelihood-based estimators and Bayesian techniques.

Collaborators: Dr. Giulia Marcon and Dr Simone Padoan.

Downloads: $> 12,000$ (Dec 2021).

[2.] R package **CompRandFld** (Composite-Likelihood Based Analysis of Random Fields)

Available on CRAN (https://cran.r-project.org/package=CompRandFld) .

Description: Provides a set of procedures for for the analysis of Random Fields using likelihood and non-standard likelihood methods.

Collaborators: Dr. Moreno Bevilacqua and Dr Simone Padoan.

Downloads: $> 46,000$ (Dec 2021).

CURRENT RES-
-PONSIBILITIES

Statistical Society of Australia, NSW Branch
Treasurer 2018-
Member of the council 2017-

UNSW Statistics Seminar Series
Organiser 2018-

OUTREACH

Year 10 Work Experience Program 2017-2019
ACEMS initiative with local High Schools
7 day program involving a dozen of high school students.

OTHER

14th International Conference of the ERCIM WG on Computational and Methodological Statistics 2021
Session organizer,
King's College,London (UK).

Modelling extreme rainfall and floods: sharing perspectives of extreme value theory and climate science 2021
Organising committee member,
Online.

Early Career Researchers Retreat 2017
Organising committee member,
Gold Coast (Australia)
Part of ARC Centre of Excellence for Mathematical and Statistical Frontiers annual retreat.

Statistics Reading Group 2016-2018
Organizer
School of Mathematics and Statistics, UNSW Sydney

Organising committee member 2014
1st Annual Postgraduate Conference
School of Mathematics and Statistics, UNSW Sydney

REFEREES

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