THE UNIVERSITY *of* EDINBURGH
School of Mathematics

# Miguel de Carvalho


**Contact Information**

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**Personal Details**

Born Sep 20, 1980 in Montijo, Lisbon.
Portuguese and EU citizenship.

**Interests**

Applied Statistics, Biostatistics, Econometrics, Risk Analysis, Statistics of Extremes.

**Education**†

**University of Lisbon**, Portugal

Habilitation in Probability and Statistics, 2019
Thesis: *Statistical Modeling of Extremes*

**NOVA School of Science and Technology**, Portugal

PhD in Mathematics with emphasis on Statistics, 2009
Thesis: *Extremum Estimators and Stochastic Optimization*
Advisors: Manuel Esquível and Tiago Mexia
Advisors of Advisors: Jean-Pierre Kahane and Tiago de Oliveira.

**NOVA School of Business and Economics**, Portugal

MSc in Economics, 2009
Thesis: *Mean Regression for Censored Length-Biased Data*
Advisors: José A. F. Machado and Pedro Portugal
Advisors of Advisors: Roger Koenker and John Addison.

**NOVA School of Science and Technology**, Portugal

*Licenciatura* in Mathematics, 2004
Professional Probation Period: Statistics Portugal (*Instituto Nacional de Estatística*).

**Awards & Honours**

- **ISBA (International Society for Bayesian Analysis)**
  Lindley Award, 2019.
- **TWAS (Academy of Sciences for the Developing World)**
  Young Scientist Prize, 2015.
- **International Statistical Institute**
  Elected Member, 2014.
- **American Statistical Association**
  Young Researcher Award, Section on Risk Analysis, 2011.
- **National Institute of Statistical Sciences | American Statistical Association**
  Honorary Mention as a Finalist NISS/ASA Best y-BIS Paper Award, 2010.
- **Portuguese Statistical Society** (*Sociedade Portuguesa de Estatística*)
  Young Researcher Award, 2009.
- **International Association for Statistical Computing**
  ERS IASC Young Researcher Award, 2008.

**Publications on** Applied Statistical Modeling

[1] Palacios Ramirez, V., de Carvalho, M., & Gutierrez, L. (2024, to appear). Heavy-tailed ngg-mixture models. *Bayesian Analysis*.

†QS Top 50 under 50 ranks NOVA University Lisbon (UNL) as one of the leading young universities in the world, and the Financial Times ranks NOVA School of Business and Economics as one of the leading business schools in Europe. *Licenciatura* (licentiate) is a five-year academic degree programme; the last year was dedicated to a professional probation period at the Portuguese Office for National Statistics (known as Statistics Portugal).

[2] Lee, J., de Carvalho, M., Rua, A., & Avila, J. (2024, to appear). Bayesian smoothing for time-varying extremal dependences. *Journal of the Royal Statistical Society, Ser. C.*

[3] de Carvalho, M., Huser, R., & Rubio, R. (2023). Similarity-based clustering for patterns of extreme values. *Stat*, *12*, e560.

[4] Sharifi Far, S., Inacio, V., Paulin, D., de Carvalho, M., Augustin, N., Allerhand, M., & Robertson, G. (2023). Consultancy style dissertations in statistics and data science: Why and how. *The American Statistician*, *77*, 331–339.

[5] de Carvalho, M., Kumukova, A., & Reis, G. d. (2022). Regression-type analysis for multivariate extremes. *Extremes*, *25*, 595–622.

[6] Galasso, B., Zemel, Y., & de Carvalho, M. (2022). Bayesian semiparametric modelling of phase-varying point processes. *Electronic Journal of Statistics*, *16*, 2518–2549.

[7] de Carvalho, M., Pereira, S., Pereira, P., & de Zea Bermudez, P. (2022). An extreme value Bayesian lasso for the conditional left and right tails. *Journal of Agricultural, Biological and Environmental Statistics*, *27*, 222–239.

[8] Inácio, V., Lourenço, V., de Carvalho, M., Parker, R., & Gnanapragasam, V. (2022). Robust and flexible inference for the covariate-specific ROC curve. *Statistics in Medicine*, *40*, 5779–5795.

[9] Turkman, M. A., Turkman, K. F., de Zea Bermudez, P., Pereira, S., Pereira, P., & de Carvalho, M. (2021). Calibration of the bulk and extremes of spatial data. *Revstat—Statistical Journal*, *41*, 167–180.

[10] de Carvalho, M., Barney, B., J., & Page, G. L. (2020). Affinity-based measures of biomarker performance evaluation. *Statistical Methods in Medical Research*, *29*, 837–853.

[11] Lee, J., & de Carvalho, M. (2019). Technological improvements or climate change? Bayesian modeling of time-varying conformance to Benford's law. *PLOS ONE*, *12*, e0213300.

[12] Mhalla, L., de Carvalho, M., & Chavez-Demoulin, V. (2019). Regression type models for extremal dependence. *Scandinavian Journal of Statistics*, *46*, 1141–1167.

[13] de Carvalho, M., Page, G. L., & Barney, B., J. (2019). On the geometry of Bayesian inference. *Bayesian Analysis*, *14*, 1013–1036.

[14] Inácio de Carvalho, V., de Carvalho, M., & Branscum, A. J. (2018). Bayesian bootstrap inference for the ROC surface. *Stat*, e211.

[15] Martos, G., & de Carvalho, M. (2018). Discrimination surfaces with application to region-specific brain asymmetry analysis. *Statistics in Medicine*, *11*, 1859–1873.

[16] Castro, D., de Carvalho, M., & Wadsworth, J. L. (2018). Time-varying extreme value dependence with application to leading European stock markets. *Annals of Applied Statistics*, *12*, 283–309.

[17] Hanson, T. E., de Carvalho, M., & Chen, Y. (2017). Bernstein polynomial angular densities of multivariate extreme value distributions. *Statistics and Probability Letters*, *128*, 60–66.

[18] Tsagbey, S., de Carvalho, M., & Page, G. L. (2017). All data are wrong, but some are useful? Advocating the need for data auditing. *The American Statistician*, *71*, 231–235.

[19] Inácio de Carvalho, V., de Carvalho, M., & Branscum, A. J. (2017). Nonparametric Bayesian covariate-adjusted estimation of the Youden index. *Biometrics*, *73*, 1279–1288.

[20] Castro, D., & de Carvalho, M. (2017). Spectral density regression for bivariate extremes. *Stochastic Environmental Research and Risk Assessment*, *31*, 1603–1613.

[21] Inácio de Carvalho, V., de Carvalho, M., Alonzo, T. A., & González-Manteiga, W. (2016). Functional covariate-adjusted partial area under the specificity-ROC curve with an application to metabolic syndrome diagnosis. *Annals of Applied Statistics*, *10*, 1472–1495.

[22] de Carvalho, M. (2016b). Mean, what do you mean? *The American Statistician*, *70*, 270–274.

[23] Marques, F. J., Coelho, C. A., & de Carvalho, M. (2015). On the distribution of linear combinations of independent Gumbel random variables. *Statistics and Computing*, *25*, 683–701.

[24] de Carvalho, M., & Davison, A. C. (2014). Spectral density ratio models for multivariate extremes. *Journal of the American Statistical Association*, *109*, 764–776.

[25] Inácio de Carvalho, V., Jara, A., Hanson, T. E., & de Carvalho, M. (2013). Bayesian nonparametric ROC regression modeling. *Bayesian Analysis*, *8*, 623–646.

[26] de Carvalho, M., Turkman, K. F., & Rua, A. (2013). Dynamic threshold modelling and the US business cycle. *Journal of the Royal Statistical Society, Ser. C*, *62*, 535–550.

[27] de Carvalho, M., Oumow, B., Segers, J., & Warchoł, M. (2013). A Euclidean likelihood estimator for bivariate tail dependence. *Communications in Statistics—Theory and Methods*, *42*, 1176–1192.

[28] de Carvalho, M. (2012). A generalization of the Solis–Wets method. *Journal of Statistical Planning and Inference*, *142*, 633–644.

[29] de Carvalho, M., Fonseca, M., Oliveira, M., & Mexia, J. T. (2012). A dimension reduction technique for estimation in linear mixed models. *Journal of Statistical Computation and Simulation*, *82*, 219–226.

[30] de Carvalho, M., & Ramos, A. (2012). Bivariate extreme statistics, II. *Revstat—Statistical Journal*, *10*, 83–107.

## Publications on Forecasting, Applied Econometrics and Risk Analysis

[31] de Carvalho, M., & Martos, G. (2022). Modeling interval trendlines: Symbolic singular spectrum analysis for interval time series. *Journal of Forecasting*, *41*, 167–180.

[32] de Carvalho, M., & Martos, G. (2020). Brexit: Tracking and disentangling the sentiment towards leaving the EU. *International Journal of Forecasting*, *36*, 1128–1137.

[33] de Carvalho, M., & Rua, A. (2017). Real-time nowcasting the US output gap: Singular spectrum analysis at work. *International Journal of Forecasting*, *33*, 185–198.

[34] de Carvalho, M., & Rua, A. (2014). Extremal dependence in international output growth: Tales from the tails. *Oxford Bulletin of Economics and Statistics*, *76*, 605–620.

[35] de Carvalho, M., Rodrigues, P. C., & Rua, A. (2012). Tracking the US business cycle with a singular spectrum analysis. *Economics Letters*, *114*, 32–35.

[36] de Carvalho, M., & Júlio, P. (2012). Digging out the PPP hypothesis: An integrated empirical coverage. *Empirical Economics*, *42*, 713–744.

[37] de Carvalho, M., & Marques, F. J. (2012). Jackknife Euclidean likelihood-based inference for Spearman's rho. *North American Actuarial Journal*, *16*, 487–492.

## Publications on Applied Mathematical Modeling

[38] Svetlosak, A., de Carvalho, M., & Calabrese, R. (2023). Subject-to-group statistical comparison for open banking-type data. *Journal of the Operational Research Society*, *74*, 703–718.

[39] Rodrigues, P. C., & de Carvalho, M. (2013). Spectral modeling of time series with missing data. *Applied Mathematical Modelling*, *37*, 4676–4684.

[40] de Carvalho, M. (2011). Confidence intervals for the minimum of a function using extreme value statistics. *International Journal of Mathematical Modelling and Numerical Optimisation*, *2*, 288–296.

## Publications on Book Chapters

[41] de Carvalho, M. (2016c). Statistics of extremes: Challenges and opportunities. In *Extreme Events in Finance: A Handbook of Extreme Value Theory and its Applications*. Wiley: New York.

[42] Inácio de Carvalho, V., Jara, A., & de Carvalho, M. (2015). Bayesian nonparametric approaches for ROC curve inference. In *Nonparametric Bayesian Inference in Biostatistics* (pp. 327–344). Springer: New York.

[43] Johnson, W. O., & de Carvalho, M. (2015). Bayesian nonparametric biostatistics. In *Nonparametric Bayesian Inference in Biostatistics* (pp. 15–54). Springer: New York.

## Publications on Contributions to Papers with Discussion

[44] de Carvalho, M., Kukmova, A., & Palacios Ramírez, V. (2023). Discussion of ≪The importance of context in extreme value analysis with application to extreme temperatures in the USA and Greenland≫ by Clarkson, D., Eastoe, E. & Leeson, A. *Journal of the Royal Statistical Society, Ser. C*, *72*, 853–854.

[45] Huser, R., de Carvalho, M., & Lombardo, L. (2018). Discussion of ≪Spatiotemporal models with virtual reality: from fully immersive environments to applications in stereoscopic view≫ by Castruccio, S., Genton, M. & Sun, Y. *Journal of the Royal Statistical Society, Ser. A*, *82*, 431–432.

[46] de Carvalho, M., Page, G. L., & Barney, B., J. (2017). Discussion of ≪Random-Projection Ensemble Classification≫ by Cannings, T. I. and Samworth, R. J. *Journal of the Royal Statistical Society, Ser. B*, *79*, 1007–1008.

[47] de Carvalho, M., & Rua, A. (2016). Discussion of ≪Of Quantiles and Expectiles: Consistent Scoring Functions, Choquet Representations and Forecast Rankings≫ by Ehm, W., Gneiting, T., Jordan, A., and Krüger, F. *Journal of the Royal Statistical Society, Ser. B*, *78*, 539–540.

[48] de Carvalho, M. (2016a). Discussion of ≪Statistical Modelling of Citation Exchange Between Statistics Journals≫ by Hennig, C. & Liao, T. F. *Journal of the Royal Statistical Society, Ser. A*, *179*, 44–45.

[49] de Carvalho, M., & Page, G. L. (2013). Discussion of ≪How to Find an Appropriate Clustering for Mixed Type Variables with Application to Socio-Economic Stratification≫ by Hennig, C. and Liao, T. F. *Journal of the Royal Statistical Society, Ser. C*, *62*, 343–344.

[50] Inácio, V., de Carvalho, M., & Turkman, M. A. (2012). Discussion of ≪Probabilistic Index Models≫ by Thas, O., de Neve, J., Lieven, C. and Ottoy., J.-P. *Journal of the Royal Statistical Society, Ser. B*, *74*, 659–661.

## Publications on History of Statistics†

[51] Alves, I. F., & de Carvalho, M. (2015). An interview with Ivette Gomes. *Extremes*, *18*, 563–583.

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†I have also interviewed Emeritus Prof. Colin Aitken on his trajectory and on the history of Statistics in Edinburgh.

The interview was published at the Oxford University Press journal, *Law, Probability and Risk* (2021 *20*, pp. 63–68).

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## Books in Preparation

1. de Carvalho, V. I., de Carvalho, M., Johnson, W. O. & Branscum, A. *Flexible Bayesian Models for Medical Diagnostic Data*, Chapman & Hall/CRC. Pages ≈ 250. (Expected 2024)

2. de Carvalho, M., Huser, R, Naveau, P. & Reich, B. *Handbook on Statistics of Extremes*, Chapman & Hall/CRC. Pages ≈ 650. (Expected 2024)

3. Coles, S., de Carvalho, M. & Davison, A. C. *An Introduction to Statistical Modeling of Extreme Values*. Second Edition. Springer. Pages ≈ 350. (Expected 2025)

Unrefereed Publications

Conference Papers

1. Bernieri, E. & de Carvalho, M. (2022). On classical measurement error within a Bayesian nonparametric framework. In: *Recent Developments in Statistics and Data Science*, pp. 353–362. New York: Springer.
2. de Carvalho, M. & Davison, A. C. (2011). Semiparametric estimation for $K$-sample multivariate extremes. In *Proc. 58th World Congress Int. Statist. Inst.*
3. Oumow, B., de Carvalho, M. & Davison, A. C. (2011). A Bayesian P-spline mixture model for nonstationary extremes. In *Proc. 17th European Young Statist. Meeting.*
4. de Carvalho, M., Esquível, M. L. & Mexia, J. T. (2009). A general stochastic optimization method for extremum estimators. In *Proc. 6th St. Petersburg Workshop on Simulation*, pp. 431–435.
5. de Carvalho, M. (2009). Recasting mean regression for censored data. In *Proc. 16th European Young Statist. Meeting.*
6. Rodrigues, P. C. & de Carvalho, M. (2008). Monitoring calibration of the Singular Spectrum Analysis method. In *Proc. COMPSTAT 2008—18th International Conference on Computational Statistics*, Physica-Verlag, pp. 955–964.
7. de Carvalho, M., Rodrigues, P. C. & Silva, J. (2008). A singular spectrum analysis of the New York Stock Exchange composite index. In *Proc. 31st Annual Congress of the European Accounting Association.*

Professional Experience†

- **University of Edinburgh**, UK
  Reader in Statistics (= Associate Professor in US). (2019–onwards)
  Lecturer in Statistics (= Assistant Professor in US). (2017–18)
- **University of Aveiro**, Portugal
  Honorary Position, Visiting Full Professor. (2023–onwards)
- **Pontificia Universidad Católica de Chile** (PUC Chile), Chile
  Associate Professor of Statistics. (2016)
  Assistant Professor of Statistics. (2012–15)
- **École Polytechnique Fédérale de Lausanne** (EPFL), Switzerland
  Post-Doctoral Fellow. (2010–12)
- ***Banco de Portugal***, Portugal
  Visiting Researcher. (2010)
- **NOVA University Lisbon** (UNL), Portugal
  Lecturer. (2009)

†According to QS World University Rankings 2024, the University of Edinburgh and EPFL are respectively ranked #22 and #36 worldwide, whereas Pontificia Universidad Católica de Chile (PUC Chile) was ranked #1 in Latin America. *Banco de Portugal* is part of the European System of Central Banks (ESCB) and of the Eurosystem.

Experience on

Funding

Total awarded ≈ **1 000 000 US$**; 7 concluded, 1 won but not taken

1. Royal Society of Edinburgh Fellowship. £49 962
2. Abrdn: PI for Collaborative Research Project. £294 740
3. Portuguese NSF (FCT): PI on grant PTDC/MAT-STA/28649/2017, 2018–22. 238 432€
4. Unilever: PI on grant for industrial doctorate, 2017–22. £47 217

5. Datalab: Co-PI on grant for industrial doctorate, 2017–21. £35 275
6. Chilean NSF (FONDECYT): PI on grant 1160990 (Regular), 2016–20. (Ranked 2nd on Mathematics at the national level; rejected the grant due to a job offer from UoE). ≈ 130 000 US$
7. Chilean NSF (FONDECYT): PI on grant 11121186 (Iniciación), 2012–15. ≈ 100 000 US$
8. Portuguese NSF (FCT): PhD & Postdoctoral Fellowship; 2004–08, 2011–12.
9. Banco de Portugal: Visiting Researcher Fellowship, 2009–10.

FUNDING (UNDER REVIEW) Total under review = £60 518

1. Leverhulme Fellowship: "*Interfacing Extreme Value Theory with Statistical Learning*," 2024–2025. Budget = £60 518

## EXPERIENCE ON EDITING

Associate Editor

1. *The American Statistician* (2022–onwards)
2. *Annals of Applied Statistics* (2014–onwards)
3. *Bayesian Analysis* (2023–onwards)
4. *Computational Statistics & Data Analysis* (2017–2021)
5. *Extremes* (2023–onwards)
6. *Journal of the American Statistical Association* (2018–2021)
7. *Statistics and Public Policy* (2015–2018)

Editor

1. *Bernoulli News* (2015–2019)

Special issues and other volumes

1. *New Frontiers in Statistics and Data Science* (in Preparation), Eds. M. de Carvalho, S. Faria, L. Henriques-Rodrigues, L. Meira Machado, R. Menezes. New York: Springer.
2. *Recent Developments in Statistics and Data Science* (2022), Eds. R. Bispo, L. Henriques-Rodrigues, R. Alpizar-Jara, M. de Carvalho. New York: Springer.
3. *Revstat—Statistical Journal*, Vol. 12, 2014, *Statistical Models for Diagnosis and ROC Analysis*, Eds. V. I. de Carvalho, M. de Carvalho & W. G. Manteiga.
4. *Communications in Statististics—Theory and Methods*, Vol. 42, 2013, *Special Issue: European Young Statisticians*, Eds. P. C. Rodrigues & M. de Carvalho.
5. *Revstat—Statistical Journal*, Vol. 10, 2012, *A Collection of Surveys on Tail Event Modeling*, Eds. M. de Carvalho, A. C. Davison & J. Beirlant.

## EXPERIENCE ON REVIEWING

Articles

- Probability & Statistics

  *Advances in Applied Probability*, *Annals of Applied Statistics*, *Annals of Statistics*, *Bernoulli*, *Biostatistics*, *Brazilian Journal of Probability and Statistics*, *Biometrika*, *Canadian Journal of Statistics*, *Chilean Journal of Statistics*, *Communications in Statistics—Theory and Methods*, *Computational Statistics and Data Analysis*, *Environmetrics*, *Extremes*, *Journal of Agricultural, Biological, and Environmental Statistics*, *Journal of Applied Probability*, *Journal of Multivariate Analysis*, *Journal of Statistical Computation and Simulation*, *Journal of Statistical Planning and Inference*, *Journal of Statistical Theory and Practice*, *Journal of the American Statistical Association*, *Journal of the Royal Statistical Society, Ser.* C, *Revstat—Statistical Journal*, *Statistical Modelling*, *Scandinavian Journal of Statistics*, *Stat*, *Statistics and Computing*, *Statistics and Public Policy*, *Statistics in Medicine*, *Statistical Methods in Medical Research*, *Technometrics*.

- Applied Mathematics & Computer Science

  *Annals of Operations Research*, *IEEE Transactions on Signal Processing*, *Knowledge-Based Systems*, *Mathematics and Computers in Simulation*.

- Economics & Management

  *Applied Economics*, *Journal of Business Cycle Measurement and Analysis*, *Portuguese Economic Journal*, *Tourism Management*.

- Other

  *Royal Society Open Science*, *BMJ Open*.

Books: Palgrave Texts in Econometrics, Springer.

Funding: Member of EPSRC (Associate Peer Review College), Czech Science Foundation, FWO (Research Foundation Flanders), Chilean NSF (CONICYT).

## Experience on Lecturing

Short courses

1. Instructor, *Statistics of Extremes—Modeling, Inferences, and Applications*. LARS—IASC School on Computational Statistics and Data Science. Salvador, Brazil; Oct 2019. Joint with: D. Gamerman and M. Leonelli.
2. Instructor, *A Crash Course on Statistics of Multivariate Extremes*. NOVA University Lisbon, Portugal, Dec. 2015.
3. Instructor of the short course *Statistics of Extremes: Large Risks, Small Probabilities*. XXI Statistics Week, PUC Valparaíso, Chile; Oct. 2015.
4. Instructor, *Flexible Bayesian Methods for Diagnosis and ROC Curve Estimation*. CEAUL, Lisbon, Portugal; June 2014. Joint with: V. Inácio de Carvalho.
5. Instructor, *Modeling Statistics of Extremes*, 56th RBRAS, annual meeting of a regional section of the International Biometric Society, Maringá, Brazil; July 2011.
6. Teaching assistant, *Quantitative Risk Management*. Course organized by the Mathematics Section, EPFL and RiskLab, ETH Zurich. Lausanne, Switzerland; Feb. 2011. Main instructors: V. Chavez-Demoulin, A. C. Davison, and P. Embrechts.
7. Teaching assistant, *Applied Bayesian Nonparametrics*. EPFL Doctoral School, Mathematics Programme. Lausanne, Switzerland; Oct. 2010. Main instructors: T. E. Hanson and A. Jara.

## Experience on Leading & Organizing

Leading

- Vice-President, ECAS (European Courses in Advanced Statistics). (2023–onwards)
- Co-chairman, CMStatistics team *Statistics of Extremes and Applications*. (2020–onwards)
- Director, Centre for Statistics, University of Edinburgh. (2019–2021)
- Elected Member, Council of the International Statistical Institute (2023–2027)
- Elected Member, Board of Directors, Int. Soc. for Bayesian Analysis. (2020–2022)
- Member of the Board of European Courses in Advanced Statistics. (2021–2023)
- President, Portuguese Statistical Society. (2021–2023)

Conferences and Workshops

- 1st *Int. Day of Women in Statistics & Data Science*. Oct 2022. ≈ 250 participants

- Chairman, SPE 2021, Évora. ≈ 200 participants
- Co-chairman, EVA 2021, Edinburgh. ≈ 340 participants
- Co-chairman, New Frontiers in Statistics of Extremes, Lisbon, 2020. ≈ 50 participants
- Co-chairman, ERCIM 2018, Pisa. ≈ 1550 participants
- Leading Organizer, ISBA 2018, Edinburgh. ≈ 750 participants
- Co-chairman, European Young Statisticians Meeting, Lisbon, 2011. ≈ 50 participants

Scientific Committees

- ERCIM 2023, Berlin.
- International Conference on Data Science 2023 (IASC), Santiago de Chile.
- SPE 2023; Guimarães.
- COMPSTAT 2022; Bologna.
- SEIO 2022; Granada.
- SPE 2021; Évora.
- ERCIM 2019; London.
- 1st Latin American Conference on Statistical Computing, Gramado; 2016.
- CLATSE 2014 (Congreso de Sociedades Latinoamericanas de Estadística), La Serena.

Sessions

- Invited Session "Bayesian Extreme Value Analysis," COMPSTAT 2020, Bologna; Aug. 2020.
- Special Topic Session "Bayesian Inference for Extreme Values," ERCIM 2019, London; Dec. 2019.
- Special Invited Session "Graphical and Geometrical Statistics," ERCIM 2018, Pisa; Dec. 2018.
- Special Topic Session "Bayesian Analysis," ERCIM 2017, London; Dec. 2017.
- Special Topic Session "Multivariate Extremes," ERICM 2016, Sevilla; Dec. 2016.
- Special Topic Session "Risk and Extremes: Analysis, Dependence Modeling, and Prediction," 60th World Congress Int. Statist. Inst., Rio de Janeiro; July 2015.
- Joint meeting of y-BIS and jSPE and organized of the invited session "Extremes and Applications," Lisbon, July 2012.
- Invited session "Extreme Value Statistics." ISBIS 2010, Portoroz, July 2010.

## Experience on

### Scientific Collaboration

- Scientific committee of SFRA (Scottish Financial Risk Academy). (2017–2019)
- CEAUL (Center for Statistics & Applications), University of Lisbon. (2008–onwards)
- NOVA MATH (Center for Math. & Applications), NOVA University Lisbon. (2006–2014)

Experience on **Research Supervision** (PhD & Post-docs) **10** completed, **1** finishing, **1** ongoing

Complete and with Academic Jobs

- Alina Kumukova. Now a Post-Doctoral Fellow, Univ. of Edinburgh, UK. (2023–onwards)
- Karla Palacios. Now a Lecturer, Newcastle Univ., UK. (2023–onwards)
- Daniela Castro. Now a Lecturer, Univ. of Glasgow, UK. (2013–2016)
- Soraia Pereira.‡ Now an Assistant Prof., Univ. of Lisbon, Portugal. (2019–2022)
- Gabriel Martos.‡ Now an Assistant Prof., Torcuato di Tella Univ., Argentina. (2015–2016)

NOTE: ‡ indicates post-docs.

Complete and with Industry Jobs

- Andrej Svetlosak.
- Emmanuel Bernieri (Industrial PhD with Unilever). Founder of the financial start-up alluvie (`https://alluvie.com/`) and a senior quant at Meritis. (2018–2022)
- Junho Lee. Now a Senior Examiner at FSS (South Korea Financial Regulator). (2017–2021)
- Bastian Galasso. Now the Lead Data Scientist of Coca-Cola Embonor. (2014–2019)
- Rodrigo Rubio (joint with R. Huser). Now, Head of Data & Analytics, BCI Bank. (2014–2019)

Finishing and Ongoing

- Anwar Alabdulathem. (Expected 2024)
- Johnny Lee (joint with D. Paulin). (Expected 2025, started 2022)

Experience on **Supervision of Classical and Consultancy-Style Thesis**† (MSc) **Total > 100**

MSc in Statistics with Data Science—University of Edinburgh

I have supervised > **100** MSc consultancy-style dissertations:

- ≈ 25 MSc dissertations in collaboration with the Lloyds Banking Group (one of the largest British financial institutions) and A. Lenzi on a auto-encoders, explainability, and network anomalies. (2022–2023)
- ≈ 25 MSc dissertations in collaboration with the Lloyds Banking Group and M. Allerhand (UoE Statistical Consultancy Unit) on a consultancy project on cyber-attacks. (2021–2022)
- ≈ 25 MSc dissertations with the CEO from Thrift (start-up) and with I. Papastathopoulos on a consultancy project on algorithms for fairly pricing second-hand items. (2020–2021)
- ≈ 25 MSc dissertations with Earthwave (remote sensing and AI company) and with T. Cannings on a consultancy project on microwave radar altimeter snow penetration. (2018–2019)
- ≈ 10 MSc dissertations on a project on the Financial Times Brexit poll tracker. (2016–2017)

†Consultancy-style dissertations are a **novel dissertation paradigm** proposed by myself and colleagues; see [1] in publication list. On the MSc in Statistics and Operational Research, from the university *of* edinburgh, I have supervised around 6 students since 2016–2017. In my previous appointments I have also supervised MSc students such as, for example, Warchoł (EPFL, published [24]) and Tsagbey (PUC chile, published [15]).

**Examining & Evaluating**

Experience on

- Evaluator of promotion cases for: Hasselt University, University of Alabama, Universidad Torcuato Di Tella.
- Interviewing panels for: University of Edinburgh, Heriot–Watt University.
- Research degrees: KAUST, PUC Chile, Universidad de Talca, Universidad Técnica Federico Santa Maria, University of Edinburgh, University of Lisbon, University of Porto.
- Award Committe, *Nascimento Leitão—Bayer AG Prize*, University of Aveiro. (2021–23)
- Evaluation Committee on Mathematics, CONICYT (Chilean NSF) [Comités de Evaluación del Programa Formación de Capital Humano Avanzado (PFCHA)] (2017–19)
- Evaluator, Best PhD thesis Award, PUC Chile. (2013)
- Award Committee, Research Award, 17th European Young Statisticians Meeting (2011)

Experience on Teaching (course organizer & instructor) **15 courses**

University of Edinburgh

1. *Consultancy-Style Dissertations*, Supervisor (2016–22). MSc
2. *Incomplete Data Analysis*, Course Organizer (2021–22). MSc
3. *Statistical Research Skills*, Course Organizer (2017–21). MSc
4. *Statistical Methodology*, Course Organizer (2017–19). BSc
5. *Statistical Communication Skills*, Instructor (2016–17). BSc
6. *Computing for Statistics*, Instructor (2016–17). BSc

Experience on Teaching (course organizer & instructor)

Pontificia Universidad Católica de Chile

7. *Advanced Statistics*, Course Organizer (2014–16). PhD qualifying exam course
8. *Applied Stochastic Processes*, Course Organizer (2015–16). PhD qualifying exam course
9. *Generalized Linear Models*, Course Organizer (2012–14). BSc & MSc
10. *Time Series*, Course Organizer (2012–15). MSc in Statistics
11. *Mathematical Finance*, Course Organizer (2015–2016). MSc in Actuarial Science

Experience on Teaching (course organizer & instructor)

École Polytechnique Fédérale de Lausanne

12. *Quantitative Risk Management*, Course Organizer (2011–12), Teaching Fellow (2010–11). MSc Appl. Math., MSc in Financial Eng.
13. *Applied Statistics*, Course Organizer (2011–12) MSc Appl. Math.
14. *Time Series*, Teaching Fellow (2010–11) MSc Appl. Math., MSc in Financial Eng.

experience on Teaching (course organizer & instructor)

NOVA University Lisbon

15. *Calculus*, Teaching Fellow (2009) BSc in Engineering

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Beyond the above 15 courses, I have also experience tutoring for a variety of other courses.

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Teaching (workshops) **9 courses**

Experience on

University of Edinburgh

1. *Bayesian Data Analysis* (2016–18) MSc
2. *Biomedical Data Science* (2020–21) MSc
3. *Calculus and its Applications* (2021–22) BSc
4. *Statistical Consultancy* (2018–19) BSc
5. *Statistical Learning* (2018–19) BSc
6. *Statistical Programming* (2017–19) MSc
7. *Statistics (Year 2)* (2018–20) BSc
8. *The Analysis of Survival Data* (2020–21) BSc
9. *Theory of Statistical Inference* (2019–20) BSc

Experience on

Departmental Service

- Consultancy-Dissertations Organizer for MSc in Statistics with Data Science (2021–22).
(Beyond this I have been the heavily involved with these dissertations since 2016–17, where I had the vision that "An MSc in Statistics without consultancy experience would be like an MSc in Chemistry without lab experience."; see [1] for further details on this novel dissertation model.)
- Admissions Selector for MSc in Statistics and Operations Research, MSc in Statistics with Data Science (2016–19, 2022–23), University of Edinburgh.
(Duties and Responsibilities: Advise College of Science and Engineering with decision-making and admissions process, and offer guidance to applicants.)
- Member of Bayes Research Group (2021–23). Bayes Centre, UoE.
- Member of Bayes Research Group (2020–21). Bayes Centre, UoE.
- Member of the Graduate Programmes Committee (2014–16), PUC Chile, after nomination by Dean of Faculty of Mathematics; the graduate programmes consist of an MSc in Actuarial Sciences, an MSc in Statistics, and a PhD in Statistics.
(Duties and Responsibilities: This work entails responsibilities such as the renewal of accreditations of corresponding degrees, and the design of MSc and PhD qualifying exams.)
- Member of Committee of the Department of Statistics (2014–16), PUC Chile, after election by colleagues.
(Duties and Responsibilities: Assisting the Head of Department in fulfilling his duties.)

Selected Invited Talks & Seminars

Conferences

- "An extreme value Bayesian Lasso for the conditional bulk and tail," COMPSTAT (24th Internacional Conference on Computational Statistics), Bologna, Italy, Aug. 2022.
- "Elements of Bayesian Geometry," XV Brazilian Meeting on Bayesian Statistics (EBEB 2020), Maresias, Brazil, March 2020.
- "Bayesian Modelling of Conditionally Heteroscedastic Extremes," Interfaces in Extreme Value Theory and Extreme Ocean Wave Phenomena Workshop, Lancaster University, UK, Sep. 2019.
- "On the Likelihood of Black Swan Events," Matemáticos Portugueses pelo Mundo, Porto, Portugal, June 2019.
- "An Hilbert Space View on Bayesian Inference," Amazon Oxford–Warwick–Edinburgh Joint Workshop 2019, Berlin, Germany, March 2019.

- “Statistical Modeling of Time-Changing Extreme Values,” SFRA International Workshop on Machine Learning for Risk and Insurance 2019, Edinburgh, UK, Feb. 2019.
- “Diagonal Distributions,” ERCIM 2018, Dec. 2018.
- “Exponential Tilts for Heteroscedastic Extremes with an Application to Cryptocurrency Markets” COMPSTAT 2018, Aug. 2018.
- “Discrimination Surfaces for Region-Specific Brain Asymmetry Analysis,” Latent Variables 2016, University of South Carolina, Columbia, US, Oct. 2016.
- “Generalized Additive Modelling of Nonstationary Multivariate Extremes,” 4th IMS (Institute of Mathematical Statistics), Hong Kong, June 2016.
- “Bayesian Nonparametric Inference for the Proportional Tails Model,” ISBA 2016, Sardinia, Italy, June 2016. Young scientist prize award lecture [TWAS—Academy of Sciences for the Developing World]: “Some Mathematical and Statistical Aspects of Black Swan Events,” 18st TWAS–ROLAC Young Scientists Conference, Rio de Janeiro, Brazil, Nov. 2015.
- “Nonstationary Extremal Dependence Structures: Time and Space,” Workshop on Computational Space-Time Statistics, KAUST, Saudi Arabia, Oct. 2015.
- “Statistics of Extremes: Challenges and Opportunities,” The Mathematics and Statistics of Quantitative Risk Management, Oberwolfach, Germany, Sep. 2015.
- “Predictor-Dependent Multivariate Extremes,” EVA 2015, Ann Arbor, US, June 2015.
- “Bayesian Nonparametric Youden Index Modelling,” 2nd ISNPS (International Society for Nonparametric Statistics), Cádiz, Spain, June 2014.
- “A Bayesian P-Spline Mixture Model for Nonstationary Extremes,” ERCIM 2012, Oviedo, Spain, Dec. 2012.
- “Spectral Density Ratio Models for Multivariate Extremes,” Special Topic Session STS040, 58th World Congress of the Int. Statist. Inst. Also presented at the Joint Statistical Meetings, Miami, US, Aug. 2011.
- “Recasting Mean Regression for Censored Data,” 16th European Young Statisticians Meeting, Bucharest, Romania, Aug. 2009.
- “A Generalization of the Solis–Wets Method,” Petersburg Workshop on Simulation, Russia, July 2009.
- “An Approach to Stochastic Optimization,” Advances in Interdisiciplinary Statistics and Combinatorics, University of North Carolina, Greensboro, US, Oct. 2007.

## Selected Invited Talks & Seminars

seminars

- “Data-Centric Engineering of Extreme Events,” University of Cambridge, UK, Nov. 2022.
- “A Bayesian Lasso for Black Swan Events,” University of Manchester, UK, Oct. 2021.
- “An Extreme Value Bayesian Lasso for the Conditional Bulk and Tail,” Lancaster University, UK, May 2021.
- “Time-Changing Extreme Value Copulas,” Newcastle University, UK, Jan. 2019.
- “On Some Geometrical Aspects of Bayesian Inference,” Machine Learning Seminar, University of Sheffield, UK, April 2018.
- “Multivariate Nonstationary Extremes,” University of St. Andrews, UK, April 2018.
- “Bayesian Flexible Modelling for Families of Random Densities,” Bocconi University, Milan, Italy, Sep. 2017.

- "Affinity-Based Measures of Diagnostic Test Accuracy," Glasgow University, UK, April 2017.
- "Similarity-Based Clustering for Stock Market Extremes," Lancaster University, UK, May 2017.
- "On the Geometry of Bayesian Inference," University of California, Santa Cruz, US, Oct. 2016.
- "Spectral Field-Based Modelling for Bivariate Extremes," University of Nottingham, UK, Feb. 2014.
- "Multivariate Extremes: Modelling, Smoothing, and Regression," EPFL, Switzerland, Feb. 2013.
- "Bayesian P-Spline Mixture Modelling of Nonstationary Extreme Forest Temperatures," University of South Carolina, US, November, 2011. Also presented as invited talk at ERCIM 2012, Oviedo, Spain, Dec. 2012.

**Memberships** American Statistical Association, Bernoulli Society, Caucus for Women in Statistics, Chilean Statistical Society (SOCHE), Econometric Society, Portuguese Mathematical Society (SPM), Portuguese Statistical Society (SPE), International Society for Bayesian Analysis, Institute of Mathematical Statistics, Royal Statistical Society.

**Community** Co-founder of jSPE: Section of Young Statisticians, Portuguese Statistical Society. Member of the ERCIM Working Group: Statistics of Extremes and Applications, ISI Committee on Risk Analysis, and of the ISI Young Statisticians Committee.

**Outreach talks**

- "Combating the Disinformation Virus with a Booster of Statistical Literacy," European Statistics Day Keynote On-line Talk; FENStatS (Federation of European National Statistical Societies) and SPE (Portuguese Statistical Society), Oct. 2021.
- "Statistical Intelligence," Mundus Mathematica Masterclass; Lisbon, June 2021.
- "Surrounded by Data," Royal Institution Mathematics Masterclass; Edinburgh, Sep. 2018.

**Computing** AUCTEX, `C`, Emacs Speaks Statistics, macOS, GNU Emacs, MATLAB, Python, julia, R, RStudio.

**Software Development** Creator and maintainer of the `R` packages: `ASSA` (Applied Singular Spectrum Analysis), `extremis`, `Rmpp`, `spearmanCI`.

**Languages** Mother Tongue: Portuguese. Fluent in English (Nord Anglia Certificate, Upper Intermediate Level) and Spanish. Conversant in French.

**Music Skills** Fourth degree in classical guitar, *Conservatório Regional de Setúbal*, Portugal.

Last update: February 25, 2024.