

Konstantinos Perrakis

Contact information

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Education

- 2008–2012 PhD in Transportation Sciences**
Faculty of Business Economics, Hasselt University, Belgium.
Thesis: *Bayesian approaches for origin–destination modelling and traffic assignment inference.*
Supervisor: Prof. Davy Yanssens (Hasselt University)
Co-supervisor: Prof. Dimitris Karlis (Athens University of Economics and Business).
- 2005–2007 MSc in Statistics**
Dept. of Statistics, Athens University of Economics and Business (AUEB), Greece.
Master thesis: *Comparison of MCMC methods for the estimation of the marginal likelihood for Bayesian model evaluation.*
Supervisor: Prof. Ioannis Ntzoufras.
- 2004–2005 Preparatory Course for MSc in Statistics**
Dept. of Statistics, AUEB, Greece.
- 1998–2002 BSc in International and European Economic Studies**
Dept. of International and European Economic Studies, AUEB, Greece.

Academic and research positions

- 2025– Assistant Professor**
Dept. of Statistics, AUEB, Greece.
- 2019–2025 Assistant Professor in Statistics**
Dept. of Mathematical Sciences, Durham University, UK.
- 2016–2019 Postdoctoral Researcher**
German Center for Neurodegenerative Diseases (DZNE), Bonn, Germany.
Project: *Modelling of high-dimensional data with applications in biomedicine.*
- 2015–2016 Postdoctoral Researcher**
Dept. of Statistics, AUEB, Greece.
Project: *Bayesian variable selection using the lasso power-expected-posterior prior for large-scale problems.*
- 2014–2015 Postdoctoral Researcher**
Dept. of Statistics, AUEB, Greece.
Project: *Bayesian variable selection with power-expected-posterior priors.*
- 2013–2014 Postdoctoral Researcher**
Dept. of Hygiene, Epidemiology and Medical Statistics, Medical School, University of Athens, Greece.
Project: *Particle size and composition in Mediterranean countries: geographical variability and short-term health effects.*

Research

Journal publications

- Papastamoulis P. and **Perrakis, K.** (2026). Bayesian cluster weighted Gaussian models. *Journal of Classification*, 10.1007/s00357-026-09555-4.
- Perrakis, K.**, Lartigue, T., Dondelinger, F. and Mukherjee, S. (2023). Regularized joint mixture models. *Journal of Machine Learning Research*, **24**, 1-47.
- Warnat-Herresthal, S., **Perrakis, K.**, Taschler, B., Becker, M., Bassler, K., Beyer, M., Günther, P., Schulte-Schrepping, J., Seep, L., Klee, K., Ulas, T., Haferlach, T., Mukherjee, S. and Schultze, J.L. (2020). Scalable prediction of acute myeloid leukemia using high-dimensional machine learning and blood transcriptomics. *iScience*, **23**, 100780.
- Perrakis, K.**, Mukherjee, S. and The Alzheimer's Disease Neuroimaging Initiative (2020). Scalable Bayesian regression in high dimensions with multiple data sources. *Journal of Computational and Graphical Statistics*, **29**, 28-39
- Fouskakis, D., Ntzoufras, I. and **Perrakis, K.** (2020). Variations of power-expected-posterior priors in normal regression models. *Computational Statistics and Data Analysis*, **143**, 106836.
- Perrakis, K.** and Ntzoufras, I. (2018). Bayesian variable selection using the hyper-g prior in WinBUGS. *WIREs Computational Statistics*, **10**, e1442.
- Fouskakis, D., Ntzoufras, I. and **Perrakis, K.** (2018). Power-expected-posterior priors for generalized linear models. *Bayesian Analysis*, **13**, 721–748.
- Perrakis, K.**, Karlis, D., Cools, M. and Janssens, D. (2015). Bayesian inference for transportation origin-destination matrices: the Poisson-inverse Gaussian and other Poisson mixtures. *Journal of the Royal Statistical Society Series A*, **178**, 271–296.
- Perrakis, K.**, Ntzoufras, I. and Tsionas, E.G. (2014). On the use of marginal posteriors in marginal likelihood estimation via importance-sampling. *Computational Statistics and Data Analysis*, **77**, 54–69.
- Perrakis, K.**, Gryparis, A., Schwartz, J., LeTertre, A., Katsouyianni, K., Forastiere, F., Stafoggia, M. and Samoli, E. (2014). Controlling for seasonal patterns and time varying confounders in time-series epidemiological models: a simulation study. *Statistics in Medicine*, **33**, 4904–4918.
- Perrakis, K.**, Karlis, D., Cools, M., Janssens, D. Vanhoof, K. and Wets, G. (2012). A Bayesian approach for modeling origin-destination matrices. *Transportation Research Part A*, **46**, 200–212.

Articles in books

- Perrakis, K.**, Fouskakis, D. and Ntzoufras, I. (2015). Bayesian Variable Selection for Generalized Linear Models Using the Power-Conditional-Expected-Posterior Prior. In: *Bayesian Statistics from Methods to Models and Applications*, eds. S. Frühwirth-Schnatter, A. Bitto, G. Kastner and A. Posekany. Springer Proceedings in Mathematics and Statistics. Springer, Cham. Vol. **126**, pp. 59–73.
- Perrakis, K.** and Ntzoufras, I. (2015). Stochastic Search Variable Selection (SSVS). In: *Wiley StatsRef: Statistics Reference Online*, eds. N. Balakrishnan, P. Brandimarte, B. Everitt, G. Molenberghs, W. Piegorisch and F. Ruggeri. John Wiley & Sons. pp. 1-6.

Edited volumes

- Einbeck, J., Maeng, H., Ogundimu, E., and **Perrakis, K.** (Eds.) (2024). *Developments in Statistical Modelling*. Contributions to Statistics. Springer.
- Einbeck, J., Drikvandi, R., Karagiannis, G., **Perrakis, K.**, and Zhang, Q. (Eds.) (2024). *Proceedings of the 38th International Workshop on Statistical Modelling*. Durham University.

Conference papers

- Perrakis, K.**, Karlis, D., Cools, M., Janssens, D. and Wets, G. (2012). Poisson mixture regression for Bayesian inference on large over-dispersed transportation origin-destination matrices. In: Komarek, A & Nagy, S eds, *27th International Workshop on Statistical Modelling*, Prague, Statistical Modelling Society, 263–268.
- Perrakis, K.**, Karlis, D., Cools, M., Janssens, D., Kochan, B. Bellemans, T. and Wets, G. (2012). Quantifying input-uncertainty in traffic assignment models. *Transportation Research Board 91st Annual Meeting*, Washington, DC, United States, paper no.: 12-0359.
- Perrakis, K.**, Karlis, D., Cools, M., Janssens, D. and Wets, G. (2011). A Bayesian approach for modeling origin-destination matrices. *Transportation Research Board 90th Annual Meeting*, Washington, DC, United States, paper no.: 11-1158.

Papers in preparation

- Bayesian cluster weighted mixtures for generalized linear models. Joint work with P. Papastamoulis.

Technical reports

- Perrakis, K.**, Fouskakis, D. and Ntzoufras, I. (2015). “Variations of the Power-Conditional-Expected-Posterior Prior for Bayesian Variable Selection in Generalized Linear Models”, arXiv:1508.00793v2[stat.ME]. Technical report in the framework of the Operational Program “Education and Lifelong Learning” of the National Strategic Reference Framework (NSRF) – Research Funding Program “Aristeia II/PEP-BVS”.

Conference presentations

- 16–18 December 2023, Computational and Methodological Statistics (CMStatistics), London, UK, “Bayesian finite mixtures of regressions with random covariates” (talk).
- 28–30 June 2023, Statistics@Naples, Naples, Italy, “Regularized joint mixture models” (talk).
- 17–19 December 2022, Computational and Methodological Statistics (CMStatistics), London, UK, “Regularized joint mixture models” (talk).
- 18–22 March 2019, DAGStat Conference, Munich, Germany, “Scalable Bayesian regression in high dimensions with multiple data sources” (talk).
- 19–22 December 2018, Greek Stochastics κ' , Athens, Greece, “Scalable Bayesian regression in high dimensions with multiple data sources” (talk).

- 26–28 March 2018, BayesComp 2018, Barcelona, Spain, *“Scalable Bayesian regression in high dimensions with multiple data sources”* (poster).
- 03–05 July 2017, 4th Meeting on Statistics, Florence, Italy, *“Scalable Bayesian regression in high dimensions with multiple data sources”* (poster).
- 13–17 June 2016, International Society for Bayesian Analysis World Meeting, Sardinia, Italy, *“Shrinkage power-expected-posterior priors for high dimensional data”* (poster).
- 24–26 June 2015, 3rd Meeting on Statistics, Athens, Greece, *“Variable selection in binary logistic regression with the power-expected-posterior prior”* (poster).
- 20–22 December 2014, Greek Stochastics ζ' , Athens, Greece, *“Bayesian variable selection for generalized linear models using the power-conditional-expected-posterior prior”* (poster).
- 18–19 September 2014, Second Bayesian Young Statisticians Meeting, Vienna University of Economics and Business, Austria, *“On the use of marginal posteriors in marginal likelihood estimation via importance-sampling”* (talk).
- 18–19 September 2014, Second Bayesian Young Statisticians Meeting, Vienna University of Economics and Business, Austria, *“Bayesian variable selection for generalized linear models using the power-conditional-expected-posterior prior”* (poster).
- 16–20 July 2012, International Workshop on Statistical Modelling, Charles University in Prague & University of Economics, Prague, Czech Republic, *“Poisson mixture regression for Bayesian inference on large over-dispersed transportation origin-destination matrices”* (talk).
- 22–26 January 2012, Transportation Research Board 91st Annual Meeting, Washington, DC, USA, *“Quantifying input-uncertainty in traffic assignment models”* (poster).

Seminar presentations

- 29/1/2024, *“Bayesian finite mixtures of regressions with random covariates”*, Durham University, Durham, UK.
- 20/12/2019, *“Latent group structure and regularized regression”*, AUEB, Athens, Greece.
- 28/10/2019, *“Latent group structure and regularized regression”*, Durham University, Durham, UK.
- 22/12/2017, *“Scalable Bayesian regression in high dimensions with multiple data sources”*, AUEB, Athens, Greece.
- 12/06/2014, *“On the use of marginal posteriors in marginal likelihood estimation via importance-sampling”*, AUEB, Athens, Greece.

Research funding

- 2026–2028** Principal Investigator of the research project **“Bayesian Modelling and Computation for Flexible Mixture and Regression Models”**, funded through the programme “DRASI 1: Support for tenure-track Assistant Professors at AUEB with less than six years of service”.

Referee in peer-reviewed journals

1. Annals of Applied Statistics
2. Bayesian Analysis
3. Journal of the American Statistical Association
4. Journal of Computational and Graphical Statistics
5. Journal of the Royal Statistical Society (Series C)
6. Statistical Applications in Genetics and Molecular Biology
7. Statistics
8. Statistics and Computing
9. Statistics in Medicine
10. Transportation Research Part B (Methodological)

Member of reviewing panels

- Grant proposal: “Combining shrinkage estimators for high-dimensional regression problems” submitted to the U.S.-Israel Binational Science Foundation (budget: 133,854\$).

Member of organizing/scientific committees and related activities

- Co-chair of the “38th International Workshop on Statistical Modelling (IWSM)” (Durham, July 2024).
- Member of the scientific and local organising committees of the “38th International Workshop on Statistical Modelling (IWSM)” (Durham, July 2024).
- Session organiser in the “16th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics)” (Berlin, December 2023).
- Session organiser in the “15th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics)” (London, December 2022).
- Member of the organising committee of the “3rd Meeting on Statistics” (Athens, June 2015).
- Member of the organising committee of the workshop “Summer School in Bayesian Modelling and Variable Selection using WinBUGS and R” (Athens, June 2015).

Member of PhD committees

- Internal examiner of Dr. Lampis Tzai (viva held on 13/5/2026). PhD thesis title: “*Statistical Methods for the Forensic Examination of Handwriting and Dynamic Signature Data*”. AUEB.
- Internal examiner of Dr. Kieran Richards (viva held on 26/6/2023). PhD thesis title: “*Approximate Methods For Otherwise Intractable Problems*”. Durham University.
- Internal examiner of Dr. Samuel Emerson (viva held on 5/12/2023). PhD thesis title: “*Joint Cohort Detection and Predictive Modelling alongside Safe Model Updating*”. Durham University.

Research affiliations

- Visiting Researcher in the Dept. of Statistics of AUEB from 8/10/2022 until 23/12/2022.

- Member of the Durham Biostatistics Unit (DBU) from 2022 until 2025.

Software development

- regjmix: <https://github.com/k-perrakis/regjmix>
- sbr: <https://github.com/k-perrakis/sbr>

Teaching

Courses taught

Athens University of Economics and Business, Greece.

2026–	<i>Winter:</i>	Introduction to Programming with R
	<i>Spring:</i>	Statistical Decision Theory and Game Theory
		Dept. of Statistics
2025–	<i>Spring:</i>	Applications of Statistical Methods in Business Problems
		Dept. of Accounting & Finance

Dept. of Mathematical Sciences, Durham University, UK¹

2024–2025	<i>Epiphany:</i>	Statistical Inference II (lectures/computer labs)
	<i>Michaelmas:</i>	Nonparametric Statistics IV (lectures/computer labs)
		Statistical Inference II (tutorials)
2023–2024	<i>Epiphany:</i>	Statistical Inference II (lectures/tutorials/computer labs)
		Statistics I (tutorials)
	<i>Michaelmas:</i>	Nonparametric Statistics IV (lectures/computer labs)
		Statistical Inference II (tutorials)
2022–2023	<i>Epiphany:</i>	Statistical Inference II (lectures/tutorials/computer labs)
	<i>Michaelmas:</i>	No teaching (research leave)
2021–2022	<i>Epiphany:</i>	Statistical Inference II (lectures/tutorials/computer labs)
	<i>Michaelmas:</i>	Statistical Inference II (tutorials/computer labs)
		Data Science and Statistical Computing II (computer labs)
2020–2021	<i>Epiphany:</i>	Machine Learning (lectures/computer labs)
		MSc in Data Science
		Statistical Concepts II (tutorials/practical labs)
	<i>Michaelmas:</i>	Statistical Methods III (lectures/tutorials/computer labs)
		Statistical Concepts II (tutorials/practical labs)
2019–2020	<i>Epiphany:</i>	Bayesian Statistics III/IV (lectures/computer labs)
		Statistical Concepts II (computer labs)
		Statistics I (tutorials)

Faculty of Business Economics, Hasselt University, Belgium (teaching assistant).

¹Latin numerals correspond to year of undergraduate study.

2011–2012	Methods and Techniques of Spatial Research Master in Transportation Sciences
2010–2011	Traffic and Transportation Models Master in Transportation Sciences
2009–2011	Quantitative Methods Preparatory course for Master in Transportation Sciences

Courses developed

Dept. of Mathematical Sciences, Durham University, UK

- **Statistical Inference II:** Core module of BSc in Mathematics and Statistics. Developed material on frequentist hypothesis testing, Bayesian hypothesis testing and non-parametric tests for the Epiphany term.
- **Nonparametric Statistics IV:** Developed material on Bayesian non-parametric modelling for the Michaelmas term.
- **Machine Learning:** Module of the MSc in Data Science. Developed material on high-dimensional regression techniques.

Supervisory experience

Dept. of Mathematical Sciences, Durham University.

Postgraduate level:

- 2023–2024** Co-supervisor of MSc by Research student Tingjiao Cui on the topic “*Causal Bayesian machine learning to assess effect heterogeneity of smoking or drinking with mortality for Chinese oldest old: A longitudinal analysis of Chinese Longitudinal Healthy Longevity Study*” (main supervisor: Dr. G. Karagiannis).
- 2020–2021** Supervisor of MSc in Mathematics student Rushil Gholkar on the topic “*Investigating the Bayesian Lasso*”.

Undergraduate level:

- 2024–2025** *Project IV, MSc level:* Bayesian Non-Parametrics (3 students)
- 2023–2024** *Project III, BSc level:* Penalised Regression Models (4 students)
Project IV, MSc level: Computation of Bayesian Evidence (1 student)
- 2021–2022** *Project III, BSc level:* Ridge Regression (3 students)
Project IV, MSc level: Penalised Regression (2 students)
- 2020–2021** *Project III, BSc level:* Methods and Techniques of Unsupervised Learning (4 students)
- 2019–2020** *Project III, BSc level:* Ridge Regression (2 students)

Administration

Dept. of Statistics, AUEB, Greece.

- Member of the Evaluation Committee for Appointed Teaching Staff (2026 and onwards)
- Member of the Personnel Evaluation Committee for NSRF Positions (2026 and onwards)

Dept. of Mathematical Sciences, Durham University, UK.

- Deputy chair of the Projects Committee (2024–2025).
- Member of the Projects Committee as the statistics group representative (2021–2025).
- Member of the Ethics Committee as the statistics group representative (2021–2025).
- Co-organiser of the Statistics Seminar series (2019–2022).

Further information

Scholarships

2006–2007 : Scholarship from Dept. of Statistics (AUEB) for the 2nd year of MSc in Statistics.

Participation in workshops

22–23 June 2015, AUEB, Greece, *“Summer school in Bayesian modeling and variable selection using WinBUGS & R”*.

19–20 June 2014, Imperial College London, UK, *“Computational methods for massive/complex data”*.

27–31 May 2013, MED-PARTICLES Project 2011–2013, Santorini, Greece, *“Short course on the analysis of time-series epidemiological data with application on air pollution health effects”*.