# Emilio L. Sáenz Guillén

Ph.D. Candidate in Actuarial Science
at Bayes Business School,
City St George's, University of London

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I am final-year Ph.D. candidate supervised by Prof. Vladimir Kaishev and Dr. Dimitrina Dimitrova. My research is on stochastic models using spline functions and copulas, and includes work on generalised additive models, gradient boosting, Cox regression and accelerated failure time models, and non-parametric density estimation, as well as on the modelling of real/perceived income and standard of living, and their implications in marketing.

### WORKING PAPERS

- D. S. Dimitrova, V. K. Kaishev and E. Sáenz Guillén (2025). 'GeDS: An R Package for Regression, Generalized Additive Models and Functional Gradient Boosting, based on Geometrically Designed (GeD) Splines'. Manuscript submitted for publication. Under review in the *Journal of Statistical Software*.

### WORK IN PROGRESS

- 'Density and distribution function estimation using variable-knot splines', joint project with Prof. Vladimir Kaishev and Dr. Dimitrina Dimitrova. A corresponding R package is publicly available at: `ddfs`.
- 'On the joint distribution of (perceived) income and standard of living, and its effect on inequality and new product diffusion', joint project with Prof. Vladimir Kaishev, Prof. Anirban Mukhopadhyay and Dr. Jingshi Liu. A corresponding survey study was funded by a £1,000 internal grant and implemented via Prolific and ShinyApps platforms.
- 'Bariatric Data Analytics Based on the UK National Bariatric Surgery Registry (NBSR)', joint project with Prof. Vladimir Kaishev, Dr. Dimitrina Dimitrova, and external collaborators, Miss Emma Rose McGlone from Imperial College London and Mr Omar Khan from the British Obesity & Metabolic Specialist Society (BOMSS).

### ACKNOWLEDGED COLLABORATIONS

- Montes-Rojas and Elosegui (2020). 'Network ANOVA random effects models for node attributes'. In: *Journal of Dynamics and Games* 7.3, pp. 239–252. ISSN: 2164-6066. DOI: `10.3934/jdg.2020017`

### SOFTWARE

- Dimitrina S. Dimitrova, Vladimir K. Kaishev, Andrea Lattuada et al. (2025). *GeDS: Geometrically Designed Spline Regression*. R package version 0.3.4. URL: `https://CRAN.R-project.org/package=GeDS`
- Dimitrina S. Dimitrova, Vladimir K. Kaishev and Emilio L. Sáenz Guillén (2025). *ddfs: Density & Distribution Function Estimation Using Variable-Knot Splines*. R package version 0.1.0. URL: `https://github.com/emilioluissaenzguillen/ddfs`

## ACADEMIC EXPERIENCE

**BAYES BUSINESS SCHOOL** | Doctoral Researcher — 2022–Sep/2026 (expected) | London, UK

- Research topics: splines, copulas, non-parametric methods, gradient boosting, generalized additive models, micro-level projection of mortality, pension systems modelling.
- Supervised by Prof. Vladimir Kaishev and Dr. Dimitrina Dimitrova.

**IESE BUSINESS SCHOOL** | Research Assistant — 2021–22 | Barcelona, Spain

- Research topics: banking and corporate finance. Two main projects: the first, analysed the impact of stakeholders' ESG pressures on banking behaviour; the second, examined potential moral hazards introduced by government bailout guarantees.
- Supervised by Prof. Christian Eufinger, Assoc. Prof. Stefano Sacchetto and Dr. Valentina Raponi.

**IIEP UBA-CONICET** | Research Assistant — 2019–20 | Buenos Aires, Argentina

- UBACyT grant holder under the project *Econometric methods for the selection of levels of data grouping*, led by Prof. Gabriel Montes-Rojas. Joint work with the Central Bank of the Argentine Republic (BCRA), studying the effect of network centrality on interest rate spreads in Argentine interbank markets.

**ISEPCI**| Researcher 2018 | Buenos Aires, Argentina

- Volunteered with the Índice Barrial de Precios (IBP), an interdisciplinary research project estimating the price of consumer goods basket in poor neighbourhoods in Argentina during years of unreliable official statistics. I presented a related work on wages, income, and employment in Argentina (2015–2018) at the *XI Jornadas de Economía Crítica*, organised by the Critical Economics Society.

## TEACHING EXPERIENCE

**BAYES BUSINESS SCHOOL** | Teaching Assistant 2023–Present | London, UK

• Probability and Mathematical Statistics (SMM047; CS1, IFoA curriculum); Mathematics for Actuarial Science (AS1056) - Dr. Russell Gerrard. • Probabilistic Modelling (AS3209) - Prof. Vladimir Kaishev. • Mathematics for Finance/Business Analytics (FR1202/BA1101) - Dr. Dimitrina Dimitrova.

**IMPERIAL COLLEGE BUSINESS SCHOOL** | Teaching Assistant 2024–25 | London, UK

• Finance and Pricing Strategy (MSc Strategic Marketing) - Prof. Mushegh Harutyunyan.

**LONDON BUSINESS SCHOOL** | Teaching Assistant 2022–24 | London, UK

• Time Series Analysis (E334; MBA programme) - Prof. Derek Bunn.

**IESE BUSINESS SCHOOL** | Teaching Assistant 2021–22 | Barcelona, Spain

• Banking - Prof. Christian Eufinger • Corporate Finance - Assoc. Prof. Stefano Sacchetto and Dr. Valentina Raponi

**UNIVERSITY OF NAVARRA** | Teaching Assistant 2020–21 | Pamplona, Spain

• Marketing II and Family Business - Assoc. Prof. Goretti Cabaleiro • Strategic Management - Prof. Ricardo Mateo Dueñas.

**UNIVERSITY OF BUENOS AIRES** | Teaching Assistant 2020 | Buenos Aires, Argentina

• Econometrics I - Prof. Gabriel Montes-Rojas.

## EDUCATION

**BAYES BUSINESS SCHOOL** | M.Phil./Ph.D. in Actuarial Science 2022–Present | London, UK

1st year courses[1]

**London School of Economics and Political Science** (M.Phil./Ph.D. in Statistics) Probability and Mathematical Statistics I (ST552; Prof. Umut Cetin); Probability and Mathematical Statistics II (ST553; Prof. Kostas Kardaras).

**Bayes Business School** Probability and Mathematical Statistics (SMM941; Prof. Vladimir Kaishev); Financial Econometrics (SMM943; Prof. Giovanni Urga); Pensions and Other Benefits (SMM033; SP4, IFoA curriculum; Dr. Zaki Khorasanee); Machine Learning (SMM636; Dr. Rui Zhu); Applied Deep Learning (SMM768; Dr. Philippe Blaettchen).

[1]Courses, both at LSE and Bayes Business School, included a formal written examination and were all passed with distinction.

**UNIVERSITY OF NAVARRA** | Master in Economics and Finance 2020-21 | Pamplona, Spain

GPA: 9.28/10 | Master's Thesis: 'The Chilean Pension System: Actuarial Analysis of a Paradigmatic Social Security Program'. Supervisors: Dr. José Azar and Prof. Eduardo Melinsky (Director of the Actuarial Program & Research Centre for Insurance of the University of Buenos Aires).

**UNIVERSITY OF BUENOS AIRES** 2013-20 | Buenos Aires, Argentina

Actuary Degree | Society of Actuaries (SOA) Recognition Tier: UCAP-AC. Level of Actuarial Courses: Masters.

Bachelor's Degree in Economics | Cum Laude distinction

Dissertation: *Application of the Solow Growth Model to Argentina (2004–2014): An Evaluation of the Impact of Capital, Labour, and Technology*. Supervisor: Guido Lorenzo.

## PROFESSIONAL QUALIFICATIONS AND CERTIFICATIONS

**ADVANCE HIGHER EDUCATION (UK)**| Associate Fellow (AFHEA) May 2024

**CPCE - AUTONOMOUS CITY OF BUENOS AIRES**| Fully Qualified Actuary Dec 2023

## CONFERENCES

**2026** (planned)

- 27th International Conference on Computational Statistics (COMPSTAT), 25-28 August 2026, Athens (Greece).
- 2026 ISMS Marketing Science Conference, 11-13 June 2026, Nova School of Business and Economics (Lisbon, Portugal).

**2025**

- 28th International Congress on Insurance: Mathematics and Economics held in Tartu, Estonia, on July 1-4, 2025. *Nonparametric Free-Knot Spline Density and Distribution Estimation for Heavy-Tailed Data.*
- Insurance Data Science Conference, 19-20 June 2025, Bayes Business School, City St George's, University of London. *Non-Parametric Insurance Loss Modelling using Variable-Knot Splines.*
- Perspectives on Actuarial Risks in Talks of Young Researchers 2025 (Liverpool, UK). *Estimation of Probability Density and Distribution Functions using Variable-Knot Splines with Applications to Insurance Loss Data.*

**2024**

- Bayes Business School - KU Leuven - University of Amsterdam Ph.D. Workshop 2024. *Simultaneous Estimation of Probability Density and Distribution Functions using Variable-Knot Splines.*
- Royal Statistical Society (RSS) International Conference 2024, 2-5 September, Brighton (UK). *Augmented Spline Regression for Advanced Data Analysis: Generalized Additive Models and Functional Gradient Boosting with Geometrically Designed (GeD) Splines.*
- 26th International Conference on Computational Statistics (COMPSTAT), 27-30 August 2024, University of Giessen. *Enhancing Geometrically Designed Spline (GeDS) regression through Generalized Additive Models and Functional Gradient Boosting.*
- Insurance Data Science Conference, 17-18 June 2024, Stockholm University. *Generalized Additive Models & Functional Gradient Boosting with Geometrically Designed (GeD) Splines: Application to Insurance Data.*

## OTHER WORK EXPERIENCE

**2017–18 GRUPO ISN** | PROCUREMENT AND FINANCE MANAGER Manager of the Procurement and Finance Department during the launch of a new contract with Volkswagen. Collections | Purchases (market surveys, budget evaluations, supplier relations) | General accounting.

**2015–16 UNIVERSITY OF BUENOS AIRES** | ADMINISTRATOR Administrative assistant at the Student Center of the Faculty of Psychology of the University of Buenos Aires. Responsibilities included managing supplier relations, processing wage payments, allocating scholarships, and organising academic seminars. Part-time position.

**2014–15 EL MOLINO RESTO/BAR** | COOK Part-time job.

**2012–13 SAUMA WAGEN ARGENTINA** | INTERNSHIP Accounting at an official Ford and Volkswagen dealership.

**SUPERVISION IN ARGENTINIAN ELECTIONS** PASO and Final 2013, 2015, 2017 and 2019.

## AWARDS, FELLOWSHIPS & GRANTS

• Ph.D. Studentship, Bayes Business School (2022–26) • Teaching Assistant Scholarship, University of Navarra (2020–21) • UBACyT Research Scholarship, University of Buenos Aires (2019–20)

### PROGRAMMING

Maintainer & developer
- `GeDS` R Package (CRAN; GitHub)
- `ddfs` R Package (GitHub)

Other programming & software
- C++ • Python • MATLAB • Stata • LaTeX
- SQL • Bejerman Accounting System

### OTHER CERTIFICATES

**Introductory Certificate in Academic Practice** Learning Enhancement and Development (LEaD).
**GRE** Quantitative reasoning: 166/170, 86th percentile.

### LANGUAGES

**English** Fluent. 106/120 in TOEFL; First Certificate.
**French** Fluent. Dalf C1 Aliance Française.
**German** Beginner. Goethe-Zertifikat A2: Fit in Deutsch.
**Portuguese** Bilingual, 7 years living in Portugal.
**Basque** Fluent.
**Spanish and Catalan** Mother tongue.

### VOLUNTEERING

2025 Acción por el Mantible Historic heritage initiative;
2013 - 2017 Volunteer work in Villa La Cava, San Isidro (Buenos Aires, Argentina);
2011 Volunteer work at the *Juan Bonal Foundation* (Spain).