Lisandro Javier, Fermin

Ph.D in Mathematics
Associate Professor, AMSE Aix-Marseille University

RESUME

Currently, I am an Assistant Professor (Maître de conférences) at Aix-Marseille School of Economics (AMSE), Aix-Marseille University. My research focuses on statistical inference for stochastic processes and econometrics, with applications in economics, finance, and pharmacodynamics. I work on estimation methods and model selection for dependent data, combining theoretical developments with applied perspectives. Part of my research explores the use of fractional processes in financial and economic modeling, as well as in the analysis of complex systems in biostatistics. In addition, I co-led the development of Xtingue, a dynamic platform for wildfire risk assessment and prediction implemented in the Valparaíso region (Chile), integrating advanced statistical models for disaster management and prevention.

POSITIONS

2025– – **Associate Professor**, *AMSE, Université d'Aix-Marseille*, France

2024–2025 **Invited Contractual Associate Professor**, *UFR SEGMI, Laboratoire Modal'X - UMR 9023 CNRS, Universite Paris Nanterre* , France

2012–2024 **Professor**, *at CIMFAV, Instituto de Ingeniería Matemática, Facultad de Ingeniería, Universidad de Valparaiso*, Chile

2011–2012 **Assistant Professor**, *at CIMFAV, Instituto de Ingeniería Matemática, Facultad de Ingeniería , Universidad de Valparaiso*, Chile

2010–2011 **Teacher Assistant**, *Ecole Centrale Paris*, Chatenay-Malabry, Francia

2010–2011 **Teacher Assistant**, *Universidad Paris Ouest X*, Nanterre, Francia

2009–2011 **Postdoctoral Fellow**, *at Regularity Team of INRIA-Saclay*, France

2008–2009 **ATER**, *at Université Paris V Descartes*, Francia

2007–2008 **ATER**, *at Université Paris Sud XI*, Francia

2006–2007 **Teacher Assistant**, *at Universidad Central de Venezuela*

2002–2004 **Junior Research Engineer**, *at INTEVEP-PDVSA*, Venezuela

EDUCATION

2004–2008 **Ph.D in Mathematics**, *Université Paris-Sud XI*, France

Thesis : *Aggregation of stochastic processes, disaggregation and long memory.*

Adviser : Didier Dacunha-Castelle, Emeritus Professor Professor at Université Paris-Sud XI, and José R. Leon, Full Professor at Universidad Central de Venezuela.

Date : 25/09/2008.

2000–2002 **Master in Stochastic Models**, *Universidad Central de Venezuela*

Master's Dissertation : *Signals characterizations by means of a multifractal formalism based in the wavelet transform modulus maxima.*

Adviser : Wilfredo Urbina (Professor at De Paul University - Chicago), and Nelson D. Marquez, (Professor at London University).

Date : 02/04/2002.

1994–1999 **Bachelor of Science in Mathematics**, *Universidad Central de Venezuela*

Bachelor's Dissertation : *Simulations and classifications of pressures trajectories in extraction petroleum models.*

Adviser : Ricardo Rios, Professor at Universidad Central de Venezuela.

Date : 20/03/1999.

ADMINISTRATIVE RESPONSIBILITIES

2022–2025 **Consultant**, *National Accreditation Commission of Chile*

2022–2024 **Director of CIMFAV center**, *Facultad de Ingeniería*, Universidad de Valparaíso

2021–2021 **Acting Director of CIMFAV center**, *Facultad de Ingeniería*, Universidad de Valparaíso

2017–2021 **Outreach Coordinator of CIMFAV center**, *Facultad de Ingeniería*, Universidad de Valparaíso

RESEARCH INTEREST

Probability, Statistics : Statistical inference in stochastic processes, aggregation of stochastic processes, strong dependence, weak dependence, non-parametric estimation

Applications : Probability wildfire risk models. Effects of non-adherence in pharmacodynamic models.

PUBLICATIONS

2025 **L. Fermín, R. Rubilar, S. Torres**, *Fractional Poisson process for modeling extreme values in financial data using the ABC methodology in parameter estimation*, Special Issue : Computational Data Analysis and Numerical Methods WCDANM 2024, Journal of Applied Statistics, https ://doi.org/10.1080/02664763.2025.2501173

2023 **Héctor Araya, Natalia Bahamonde, Lisandro Fermín, Tania Roa and Soledad Torres**, *On the consistency of the least squares estimator in models sampled at random times driven by long memory noise : the renewal case*, Statistica Sinica, Vol. 33, 1-26
DOI : 10.5705/ss.202020.0457

2023 **Héctor Araya, Natalia Bahamonde, Lisandro Fermín, Tania Roa and Soledad Torres**, *On the consistency of the least squares estimator in models sampled at random times driven by long memory noise : the jittered case*, Statistica Sinica, Vol. 33, 331-351
DOI : 10.5705/ss.202020.0323

2022 **Lisandro Fermín, José Marcano, Luis-Angel Rodríguez**, *A proof of consistency of the MLE for nonlinear Markov-switching AR processes*, Statistics & Probability Letters, Vol. 183, 109347
DOI : 10.1016/j.spl.2021.109347.

2020 **Lisandro Fermín, Jacques Lévy-Véhel**, *Variability and singularity arising from a Piecewise-Deterministic Markov Process applied to model poor patient compliance in the multi-IV case*, Journal of Applied Statistics, Vol. 47, 2525-2545
DOI : 10.1080/02664763.2019.1711030

2017 **L. Fermín, R. Ríos and L.A. Rodríguez**, *A Robbins-Monro algorithm for non- parametric estimation of NAR process with Markov-Switching : consistency*, Journal of Time Series Analysis, Vol. 38 (6, 809-837)
DOI : 10.1111/jtsa.12237.

2017 **L. Fermín and J. Lévy-Véhel**, *Variability and Singularity Arising From Poor Compliance in a Pharmacokinetic Model II : The Multi-Oral Case*, Journal of Mathematical Biology, Vol. 74, 809–841
doi :10.1007/s00285-016-1041-1

2016 **L. Fermín, R. Ríos and L. Rodríguez**, *Modelos de Markov Ocultos.*, XXIX Escuela Venezolana de Matemáticas, EMALCA–VENEZUELA, pp 1-123. Ediciones IVIC, 2016, ISBN 978-980-261-169-0

2006 **D. Dacunha-Castelle and L. Fermín**, *Aggregation of doubly stochastic interactive Gaussian processes and Toeplitz forms of U-statistics*, Dependence in Probability and Statistics. Lecture Notes in Statistics, 187, Eds. Bertail P., Doukhan P. et Soulier P., 287-302

2006 **D. Dacunha-Castelle and L. Fermín**, *Disagregation of long memory processes on C^∞ class*, Electronic Communications in Probability, 11, 35-44

2002 **L. Fermín and W. Urbina**, *Electrocardiograms classification by means of a multifractal formalism based in the wavelet transform modulus maxima*, Proceeding IV PanAmerican Workshop, Applied and Computational Mathematics

PRÉPUBLICATIONS

2024 **K. Bertin, L. Fermín, and M. Padrino**, *Adaptive estimation in regression models for weakly dependent data and explanatory variable with known density*, Submitted

2024 **K. Bertin, L. Fermín, and M. Padrino**, *Adaptive estimation in regression models for weakly dependent data and explanatory variable with unknown density*, Submitted,

2024 **L. Fermín, R. Ríos and L.A. Rodríguez**, *A Robbins-Monro algorithm for non- parametric estimation of NAR process with Markov-Switching : asymptotic normality.*, Submitted

2024 **L. Fermín, R. Rubilar, S. Torres**, *Modeling records process with Piecewise Deterministic Markov Models*, Submitted,

2023 **H. Araya, L. Fermín, S. Gomez, T. Roa, S. Torres**, *Estimation of a Geographically and Temporally Weighted Regression model with fractional colored noise : consistency*, Submitted,

FUNDED RESEARCH PROJECTS

2024-2025 **Projet Labex**, *Spatial weighted regression and model selection with weakly dependent observation*, SWRMSWD, Chercheur Associé.

2024-2026 **MATHAMSUD-ANID**, *Statistical modeling, nonparametric inference and model selection for complex data*, MATH-AmSud AMSUD230032, Associate Researcher.

2023-2024 **MATHAMSUD-ANID**, *Topological, combinatorial, and probabilistic aspects in dynamical systems*, Mathamsud 22-MATH-10, Associate Researcher.

2023-2027 **ANID**, *Functional stochastic differential equations driven by fractional Brownian motion : numerical approximation and statistical models*, ANID 1230807, Associate Researcher.

2022-2022 **LICHEN Challenge - UV**, *Dynamic Fire Risk Platform Xtingue 2.0*, Univeridad de Valparaíso, Director, Principal Researcher

2020-2022 **MATHAMSUD-CONICYT**, *Statistical inFerence and sensitivity ANalysis for models described by sTochASTIC differential equations (FANTASTIC).*, 20-MATH-05., Associate Researcher

2018-2019 **MATHAMSUD-CONICYT**, *SaSMoTiDep-Statistical and Stochastic modeling for time-dependent data.*, 18-MATH-07, Associate Researcher

2018-2019 **PCI-CONICYT** , *Statistical and Stochastic modeling for longitudinal data and application in biometrics using semi parametric approaches.*, REDES170123, Associate Researcher

2016-2017 **MATHAMSUD-CONICYT**, *Statistical inference for dependent stochastic processes and application in renewable energy.*, 16-MATH-03 SIDRE, Associate Researcher

2011-2023 **InnovaChile CORFO**, *Attraction of International Centres to Chile : CIRIC (Centre INRIA Chile) (Fase 1 y 2)*, Associate Researcher

2012-2014 **Proyecto DIUV - UV**, *Stochastic modelling of non-adherence to medication regimens*, Universidad de Valparaíso, Director, Principal Researcher

2012-2013 **FIC Regional Project**, *Generation of strategies for water sustainability in Petorca Province under climate change scenarios.* , FIC, Associate Researcher

2012-2015 **Innova Chile CORFO Project - Chilquinta**, *Georeferenced risk forecasting system for electricity distribution associated with extreme weather events.*, CORFO - Chilquinta, Associate Researcher

2012-2015 **Anillo Project**, *Stochastic Analysis and Applications Network (Open Systems, Energy and Information Dynamics)*, CONICyT, Coinvestigador

2009-2012 **ANIFRAC**, *Uncertainties in processes with fractal characteristics*, DIGITEO DIM- Paris, France, Associate Researcher

2002-2004 **INTEVEP**, *Lithology classification by means of a multifractal formalism*, INTEVEP-PDVSA

TEACHING EXPERIENCE

2024–2025 **Université Paris nanterre, FRANCE**, *Linear Algebra*, Statistics I, Statistics II

2011–2024 **Universidad de Valparaíso, CHILE**, *Doctorate in Statistics : Probability, Gaussian Markov random fields, Statistical inference in stochastic processes and applications, Research seminar on statistical inference for stochastic processes*, Doctorate in Mathematics : Stochastic analysis I, Statistical inference in stochastic processes, Limit theorems for long memory processes, stochastic analysis II, Research seminar in statistical inference for stochastic processes, Postgraduate course : Probability risk models and extreme value analysis, (Diploma in risk associated with extreme atmospheric and oceanographic events

Undergraduate courses : Simulation, Probability and Statistics, Calculus, Analysis, Stochastic Processes I, (Computer Engineering, Statistical Engineering, Oceanic Engineering, Commercial Engineering, Mathematics Engineering)

2017–2018 **Universidad Adolfo Ibañez, Viña del Mar - CHILE**, *Undergraduate courses : Statistics I EST103 (V-SEM- 2017/2, V-SEM 2018/2, V-SEM- 2019), Statistics II EST202 (V-SEM-2018/1, EST202 V-SEM- 2019/1*, (Commercial Engineering)

2014–2015 **Universidad Adolfo Ibañez, Viña del Mar - CHILE**, *Undergraduate courses : Probability EST101 (V-SEM 2014/1, V-SEM 2015/2), Statistics I EST103 (V-SEM- 2015-V, V-SEM-2015-1)*, (Ingeniería)

2013–2014 **Universidad Técnica Federico Santa María, CHILE**, *Undergraduate courses : Times Series I, Times Series II, TProbability Theory and stochastic processes* , (Engineering Mathematics)

2013–2013 **Pontificia Universidad Catolica de Valparaíso , CHILE**, *Postgraduate courses : Probability*, (Magister in Stadistics)

2010–2011 **Ecole Centrale Paris, FRANCIA**, *Postgraduate courses : Stochastic processes, Probability*, (Master in Engineering :)

2010–2011 **Universidad Paris Ouest X, FRANCIA**, *Undergraduate courses : Probability and statistics (TD)*, (Bachelor of Economics :)

2008–2009 **Universidad Paris V Descartes, France**, *Undergraduate courses : Statistics, Probability, Algorithms, Numeric Analysis (TD-TP)*, (Bachelor of Mathematics and Informatics)

2007–2008 **Universidad Paris Sud XI, France**, *Undergraduate courses Probability and Statictis (TD-TP)*, (Bachelor in Biology :)

1999–2007 **Universidad Central de Venezuela, Caracas - Venezuela**, *Bachelor of Mathematics : Times Series, Calculus, Partial Differential Equations, Algebra, Theory of Measure*

THESIS ADVISOR

PhD in Statistics — *Drawdown record processing and risk management of financial assets using piecewise deterministic Markov processes and heavy-tailed processes approach*. Student : Rolando Rubilar. Universidad de Valparaíso. Co-advised with Soledad Torres, 2023

PhD in Statistics — *Adaptive Estimation Methods in Regression Models* . Student : Miguel Padrino, Universidad de Valparaíso. Co-advised with Karine Bertin. (In preparation).

PhD in Statistics — *Parameter estimation in a regression model associated with stochastic partial differential equations driven by a fractional-coloured noise*. Student : Silfrido Gomez. Universidad de Valparaíso. Co-advised with Soledad Torres, 2023.

IN PREPARATION

PhD in Applied Mathematics / PhD in Statistics — *Model selection for spatial regression with cross-validation adapted to dependent data*. Student : Valentina Bastidas, Joint supervision between the University of Valparaíso and Paris Nanterre University. Co-supervised with Cécile Hardouin and Ana K. Fermín-Rodriguez, since 2024.

PhD in Statistics — *Statistical models derived from Stochastic Differential Equations of the Volterra type*. Student : Christian Araya, University of Valparaíso. Co-supervised with Soledad Torres, since 2024.

PhD in Mathematics — *Stochastic Functional Differential Equations Derived from Fractional Brownian Motion*. Student : Alexander Abreu, University of Valparaíso. Co-supervised with Soledad Torres, since 2023.

SUPERVISION OF BACHELOR'S AND MASTER'S DISSERTATIONS

Mathematical Engineer — *Automatic classification of coronographic images for detecting faults in electrical equipment*. Student : Sergio Pincheira. University of Valparaíso. Co-supervised with Hector Oliveros, 2024.

Mathematical Engineer — *Geometric downscaling model for wind fields*. Student : Francisco Benavidez. Federico Santa María Technical University. Co-supervised with Juan Peypouquet, 2017.

Master's in Mathematics — *Stochastic modeling of Wind time series*. Student : Veronica Molinet. Simón Bolívar University. Co-supervised with José R. León and Jhonatan Arteaga, 2014.

Meteorologist — *Types of hydrological regimes and flow modeling in the headwaters of the Petorca river basin*. Student : Gonzalo Guajardo Ferrada. University of Valparaíso. Co-supervised with Ana María Córdoba, 2012.