Clemente Ferrer

Ph.D. Student in Statistics

Research Interests

The interface between Statistics and AI, Extreme Value Theory and Bayesian Nonparametrics.

Education

2026–Present **Ph.D. in Statistics**, *Pontificia Universidad Católica de Chile*, Santiago, Chile

2024 **Master of Science in Mathematics**, *Universidad Técnica Federico Santa María*, Valparaíso, Chile

2019–2024 **Mathematical Engineering**, *Universidad Técnica Federico Santa María*, Valparaíso, Chile

Journal Articles

Accepted and Published

1. **Ferrer, C.**, Vallejos, R. (2025). *Is the effective sample size always less than n? A spatial regression approach*. **Statistics and Probability Letters** 218, 110309.
2. Vallejos, R., **Ferrer, C.**, Mateu, J. (2025). *A concordance coefficient for lattice data: An application to poverty indices in Chile*. **Spatial Statistics** 70, 100936.
3. De Carvalho, M., **Ferrer, C.**, Vallejos, R. (2026). *A Kolmogorov–Arnold Neural Model for Cascading Extremes*. To appear in **Extremes**.

Submitted

1. Vallejos, R., Osorio, F., **Ferrer, C.** *A new coefficient to measure agreement between two continuous variables*. Submitted to **Biometrical Journal** (Under Review).
2. Vallejos, R., **Ferrer, C.**, Vásquez, A., Díaz, R., Marín, T. *Modeling first-year engineering student performance during the pandemic*. Submitted to **The New England Journal of Statistics in Data Science** (Under Review).
3. Carrasco, C., Palme, M., Isalgue, A., **Ferrer, C.** *Adaptation and Calibration of the Eixample Model from Barcelona for Urban Climate in Valparaíso, Chile*. Submitted to **Conference IC2UHI 2026**.

Work in preparation

1. De Carvalho, M., **Ferrer, C.**, Vallejos, R., Ma, T., Sabanis, S. *Generative Cascades of Multivariate Extremes*.
2. Svetlosak, A., De Carvalho, M., He, F., Wu, W., Lee, J., **Ferrer, C.** *KLAN: Kolmogorov-Lorentz-Arnold Neural Networks*.

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Research Projects / Grants

2023–2024 **FONDECYT Project 123001**, *Research Assistant*, Chile
Agreement measures for spatio-temporal models with applications to image processing.

2023–2024 **Project OEA232**, *Research Assistant*, Universidad Técnica Federico Santa María, Chile
Quantification of Academic Performance at USM: Its Spatial Distribution and Evolution During the Pandemic.

Research Visits and Schools

Sep 2024 **Research Visit**, *School of Mathematics, University of Edinburgh*, UK
Hosted by Professor Miguel de Carvalho (September 9–15, 2024).

Nov 2025 **Applied Mathematics School (AMS)**, *CEMSE, KAUST*, Saudi Arabia
Fully sponsored one-week program (November 30–December 4, 2025).

Scholarships and Honors

2026–Present **ANID National Doctoral Scholarship**, *National Agency for Research and Development (ANID)*, Chile
Four-year fully funded fellowship awarded for doctoral studies based on academic excellence.

2025 **Marcos Orrego Puelma Award**, *Chilean Institute of Engineers*, Chile
Award to the best national engineering graduate of the 2024 cohort.

2024 **Master's Scholarship**, *Universidad Técnica Federico Santa María*, Chile
Scholarship awarded for outstanding academic performance, consisting of a monthly stipend and tuition fee exemption.

2019–2024 **Recognition on the Academic Excellence List**, *Universidad Técnica Federico Santa María*, Chile
Award for outstanding academic performance, granted for achieving a grade point average of 80 or higher on a scale of 0 to 100.

2019–2024 **Federico Santa María Scholarship**, *Universidad Técnica Federico Santa María*, Chile
Scholarship awarded for outstanding academic performance, consisting of a monthly monetary stipend.

2018 **Perfect Score in University Entrance Exam**, *Ministry of Education*, Chile
Distinction awarded for achieving the highest possible score in the Mathematics section of the Chilean University Selection Test (PSU).

Teaching Experience

Lecturer (*Universidad Técnica Federico Santa María*)

2026 Multivariable Calculus
Differential Equations

2025 Regression Analysis
Vector Calculus and PDEs
Multivariable Calculus
Probability Theory
Linear Algebra

Lecturer (*Universidad Andrés Bello*)

2025 Simulation Systems

Teaching Assistant (*Universidad Técnica Federico Santa María*)

2020–2024 Real Analysis
Statistical Inference
Introduction to Mathematical Engineering
Vector Calculus and PDEs
Multivariable Calculus and ODEs
Linear Algebra and Integral Calculus
Trigonometry and Differential Calculus
General Physics III

Industry Experience

2026–Present **Founder and CTO**, *Intelligence Systems and Consultancy, Holten*, Chile

2024 **Quant Internship**, *Investment Strategy, AFP Capital*, Chile

2023 **Data Science Internship**, *Universidad Técnica Federico Santa María*, Valparaíso, Chile

Talks as Speaker

1. **Ferrer, C.**, Vallejos, R. *A Spatial Concordance Coefficient for Areal Data*. II Congreso Geoestadística y Estadística Espacio-Temporal: Teoría y Aplicaciones, Concepción, Chile, December 11–15, 2023.
2. **Ferrer, C.**, Vallejos, R., Mateu, J. *A Spatial Concordance Coefficient for Areal Data*. XLVII Jornadas Nacionales de Estadística, Valdivia, Chile, November 16–18, 2024.
3. **Ferrer, C.**, Vallejos, R. *Is the effective sample size always less than the sample size? A spatial regression approach*. III Congreso Geoestadística y Estadística Espacio-Temporal: Teoría y Aplicaciones, Valparaíso, Chile, November 27–29, 2024.
4. **Ferrer, C.**, De Carvalho, M., Vallejos, R. *Exploring Transformer-Based Models for Cascading Extremes*. I Workshop on Generative AI Modelling for Extreme Events, Edinburgh, UK, June 13–14, 2025.

Talks as Coauthor

1. Vallejos, R. (Presenting), Osorio, F., **Ferrer, C.** *A coefficient to measure agreement between two continuous variables based on a L1 norm*. CMStatistics 2023, Berlin, Germany, December 16–18, 2023.
2. Vallejos, R. (Presenting), **Ferrer, C.** *A concordance coefficient for areal data analysis*. METMA XI: 11th International Conference on Spatio-Temporal Modelling, Lancaster, UK, July 23–25, 2024.
3. Vallejos, R. (Presenting), Osorio, F., **Ferrer, C.** *A novel coefficient for assessing agreement between two continuous variables*. 25° SINAPE: Simpósio Nacional de Probabilidade e Estatística 2024, Fortaleza, Brazil, August 4–9, 2024.

4. De Carvalho, M. (Presenting), **Ferrer, C.**, Vallejos, R. *A Kolmogorov–Arnold Neural Model for Cascading Extremes*. 2024 IMS International Conference on Statistics and Data Science (ICSDS), Nice, France, December 16–19, 2024.
5. De Carvalho, M. (Presenting), **Ferrer, C.**, Vallejos, R. *Neural Statistical Modeling of Cascading Extremes*. 39th International Workshop on Statistical Modelling, Limerick, Ireland, July 13–18, 2025.
6. Svetlosak, A. (Presenting), De Carvalho, M., He, F., Wu, W., Lee, J., **Ferrer, C.** *KLAN: Kolmogorov–Lorentz–Arnold Neural Networks*. CFE-CMStatistics 2025, London, UK, December 13–15, 2025.

Languages

Spanish	Native
English	Fluent (IELTS Academic C1, 2025)

Computer Skills

Programming	Python, R, C, TypeScript.
Data & Math	pandas, NumPy, Matplotlib, MATLAB, Mathematica.
Machine Learning	PyTorch, TensorFlow, Keras, scikit-learn.
Deep Learning	Transformers, CNNs, RNNs/LSTMs.
LLM & AI	LangChain, Anthropic API (Claude), pgvector.
Backend & Architecture	FastAPI, SQLAlchemy (Async), Redis, Celery.
Frontend	Next.js, Tailwind CSS.
Databases	PostgreSQL, SQL.
DevOps & Tools	Docker Compose, VPS Deployment, Git, VSCode.

Selected Technical Projects

1. **Agentic Hedge Fund Platform: A2A Orchestration Engine** *(Founder & Lead Architect)*
   - Designed and deployed an 8-stage asynchronous quantitative trading pipeline (Python, FastAPI, Celery) that orchestrates LLM agents (Anthropic Claude) for end-to-end market analysis.
   - Built a parallel Agent-to-Agent (A2A) evaluation system where specialized agents (Fundamental, Technical, and Risk) ingest macroeconomic data, classify market regimes, and calculate position sizing based on customizable risk thresholds.
   - Implemented a robust automated task-queue architecture (Redis) for real-time intraday scanning, portfolio monitoring, and FX alerting, fully integrated with a Next.js/TypeScript frontend and a PostgreSQL database utilizing pgvector.