



# Clemente FERRER

*M.Sc. in Mathematics*

## Research Interests

Extreme Value Theory, Spatial Statistics, Bayesian Analysis and the interface between Statistics and AI.

## Education

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

### 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.

### Submitted

1. De Carvalho, M., **Ferrer, C.**, Vallejos, R. *A Kolmogorov–Arnold Neural Model for Cascading Extremes*. Manuscript submitted to *Extremes* (Under Review).
2. Vallejos, R., Osorio, F., **Ferrer, C.** *A new coefficient to measure agreement between two continuous variables*. Manuscript submitted to *Statistics in Medicine* (Under Review).
3. Vallejos, R., **Ferrer, C.**, Vásquez, A., Díaz, R., Marín, T. *Modeling first-year engineering student performance during the pandemic*. Manuscript submitted to *The New England Journal of Statistics in Data Science*.

### Work in preparation

1. De Carvalho, M., **Ferrer, C.**, Vallejos, R. *Transformer-Based Models for Cascading Extremes*.
2. Svetlosak A., De Carvalho, M., He F., Wu W., Lee J., **Ferrer, C.**. *KLAN: Kolmogorov-Lorentz-Arnold Neural Networks*.

## Research Projects / Grants

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

2023-2024 **Project OEA232 – Research Assistant.** Quantification of Academic Performance at USM: Its Spatial Distribution and Evolution During the Pandemic.

## Research Visits

1. School of Mathematics, University of Edinburgh, UK. Research visit to Professor Miguel de Carvalho, September 9–15, 2024.

## Scholarships and Honors

- 2025 **Marcos Orrego Puelma Award, Chilean Institute of Engineers**  
Award to the best national engineering graduate of the 2024 cohort.
- 2024 **Master's Scholarship, Universidad Técnica Federico Santa María**  
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**  
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**  
Scholarship awarded for outstanding academic performance, consisting of a monthly monetary stipend.
- 2018 **Perfect Score in University Entrance Exam, Chilean Minister of Education**  
Distinction awarded for achieving the highest possible score in the Mathematics section of the Chilean University Selection Test (PSU).

## Teaching Experience

### Lecturer (*Universidad Andrés Bello*)

- 2025 Simulation Systems.

### Lecturer (*Universidad Técnica Federico Santa María*)

- 2025 Regression Analysis.  
Vector Calculus and PDEs.  
Multivariable Calculus and ODEs.  
Probability Theory.

### 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.

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## Industry Experience

- 2024 Quant Internship at Investment Strategy, AFP Capital.  
2023 Data Science Internship at Universidad Técnica Federico Santa María.

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## 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.

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## 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 04-09, 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 (ICSIDS), 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.

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## Languages

- Spanish Native  
English Advanced (IELTS Academic C1, 2025).

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## Computer skills

- Software MATLAB, Mathematica, VSCode, Anaconda.  
OS Windows, Mac OS.  
Programming  $\text{\LaTeX}$ , Python, R, C.