

# Francisco Richter Mendoza

Researcher · Mathematical Engineer

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## PROFILE

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Researcher in statistics and applied mathematics, working on causal inference and invariance, statistical network science, and biostatistics. I develop probabilistic and causal models — and the computational methods to fit them — for complex systems in the natural and data sciences.

## EDUCATION

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2015 – 2021 **PhD, Applied Mathematics** University of Groningen, The Netherlands

Thesis: *Inferring the drivers of species diversification, using statistical network science.*

2013 **Mathematical Engineer** Univ. Técnica Federico Santa María, Chile

Thesis: *Mathematical modelling applied to photometric correction in astronomical observations.*

## EXPERIENCE

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Feb 2026 – **Scientific Staff (part-time)** USI Università della Svizzera italiana, Lugano

Statistical network science, biostatistics and complex systems; modelling of species diversification and phylogenetic inference.

2023 – 2026 **Lecturer** USI Università della Svizzera italiana, Lugano

Probability & Statistics, Numerical Computing, Stochastic Methods, Ordinary Differential Equations, Data Science and Social Network Analysis (Bachelor INF; Master IA/CS).

2021 – 2023 **Postdoctoral Researcher** USI Università della Svizzera italiana, Lugano

A general phylogenetic inference framework for species diversification; graphical models of microbiome interactions across related environments.

2020 **Visiting Researcher** USI Università della Svizzera italiana, Lugano

COST STSM grant (Action CA15109): statistical network science, in a Groningen–USI collaboration.

2012 – 2015 **Senior Research Associate & Data Scientist** Evalueserve, Viña del Mar, Chile

Data science and operational risk modelling for financial clients.

2009 – 2015 **Lecturer & Research Assistant** Univ. Técnica Federico Santa María, Chile

Lectured *Matemáticas I* (2015); artificial-intelligence methods for ALMA observational scheduling (2009–2012).

2012 – 2013 **Research Assistant** ESO European Southern Observatory, Santiago, Chile

Mathematical methods for photometric correction on the Very Large Telescope (VLT).

## PUBLICATIONS

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- 2025 Neural causal regularization: extending causal invariance to deep models  
F. Richter, K. Rigana, E. Wit  
*Statistics for Innovation I*, 97–102. Springer Nature, 2025
- 2024 Random graphical model of microbiome interactions in related environments  
V. Vinciotti, E. C. Wit, F. Richter  
*Journal of Agricultural, Biological and Environmental Statistics*, 2024
- 2021 Detecting phylodiversity-dependent diversification with a general phylogenetic inference framework  
F. Richter, T. Janzen, H. Hildenbrandt, E. C. Wit, R. S. Etienne  
*bioRxiv*, 2021
- 2020 Introducing a general class of species diversification models for phylogenetic trees  
F. Richter, B. Haegeman, R. S. Etienne, E. C. Wit  
*Statistica Neerlandica* 74, 261–274. Wiley, 2020
- 2021 Microbiome and environment explain the absence of correlations between consumers and their diet in Bornean microsnails  
K. P. Hendriks, ..., F. J. Richter Mendoza, M. Schilthuizen, R. S. Etienne  
*Ecology* 102.2, e03237, 2021
- 2024 Stereo 3D cloud motion from tandem satellites  
Y. Zhou, S. Abrahams, F. Mendoza, M. Donà, R. Verbiest  
*Mathematics in Industry Reports*, 2024

## PROFESSIONAL ACTIVITIES

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- 2023 – **Associate Editor** *Statistica Neerlandica*, Wiley

## SELECTED TALKS

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- 2025 **Italian Statistical Society (SIS)** Genova, Italy  
*Invited talk*: Neural Causal Regularization — Extending Causal Invariance to Deep Models.
- 2023 **Complex Networks (CompleNet)** Aveiro, Portugal  
Detecting complex diversity-dependent diversification with a novel phylogenetic inference framework.
- 2018 **Mathematics for Planet Earth** Utrecht, The Netherlands  
*Invited talk*: a statistical approach to species diversification dynamics.

## OUTREACH

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- 2025 – **TecDays** Secondary schools, Ticino  
Organised and delivered hands-on data-science workshops for high-school students across several schools.
- 2025 – **Lavori di Maturità** USI, Lugano  
Mentored high-school students through year-long thesis projects with the Faculty of Informatics.
- 2025 – **Giornate Autogestite** Ticino, Switzerland  
Ran workshops on data science and academic life at several high schools.