

Luis Damiano

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PhD. Candidate in Statistics
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Education

Iowa State University, Department of Statistics 2018-Present

Ph.D. Candidate in Statistics. Adviser: [Jarad Niemi](#)

Iowa State University, Department of Statistics 2018-2020

Master of Science in Statistics. Adviser: [Jarad Niemi](#)

Creative Component: *"The RITAS algorithm: a constructive yield monitor data processing algorithm."*
[10.48550/arXiv.2209.11313](https://arxiv.org/abs/10.48550/arXiv.2209.11313)

Universidad Nacional de Rosario, Department of Statistics 2014-2017

[Master of Science in Applied Statistics](#). GPA 9.2/10 (~ 3.9/4).

Thesis: *"Evaluating Forecast Accuracy of GARCH Volatility Models Applied to Daily Stock Prices in Argentina."*
([Thesis](#); [Slides](#))

Pontificia Universidad Católica Argentina, Department of Administration 2006-2010

Bachelor of Business Administration, *summa cum laude*. GPA 8.9/10 (~ 3.9/4).

Additional Master-level Coursework

Universidad Nacional de Rosario, Department of Administration 2011-2014

[Master of Science in Finance](#). GPA 8.5/10 (~ 3.7/4). Completed coursework requirements.

Research Interests

Bayesian statistics, computational statistics, Gaussian processes, design and analysis of computer experiments, surrogates, uncertainty quantification.

Publications

Published

- Nowatzke, M., **Damiano, L.**, Miguez, F. E., McNunn, G. S., Niemi, J., Schulte, L. A., Heaton, E. A., & VanLoocke, A. (2022). *"Augmenting agroecosystem models with remote sensing data and machine learning increases overall estimates of nitrate-nitrogen leaching"*. Environmental Research Letters. [10.1088/1748-9326/ac998b](https://doi.org/10.1088/1748-9326/ac998b)
- Ward E., Anderson S., **Damiano L.**, Hunsicker M., Litzow M. (2019) *"Modeling regimes with extremes: the bayesdfa package for identifying and forecasting common trends and anomalies in multivariate time-series data."* The R Journal. [10.32614/RJ-2019-007](https://doi.org/10.32614/RJ-2019-007)
- **Damiano L.**, Peterson B., Weylandt M. (2018) *"A Tutorial on Hidden Markov Models using Stan."* Zenodo. Published in the proceedings of [StanCon 2018](#) and invited to present. [10.5281/zenodo.1284341](https://doi.org/10.5281/zenodo.1284341)

In Preparation

- **Damiano L.**, Johnson M., Teixeira J., Morris M.D., Niemi J. “Automatic Dynamic Relevance Determination for Gaussian process regression with high-dimensional functional inputs”. Submitted for publication. [10.48550/arXiv.2209.00044](https://arxiv.org/abs/10.48550/arXiv.2209.00044)
- **Damiano L.**, Niemi J. “The RITAS algorithm: a constructive yield monitor data processing algorithm.” Key concepts: novel data-processing algorithm for irregular, misaligned, and overlapping spatial samples; explicit modeling of error measurements for uncertainty quantification. [10.48550/arXiv.2209.11313](https://arxiv.org/abs/10.48550/arXiv.2209.11313)
- Dutter C., **Damiano L.**, Niemi J., Miller B., Schulte L.A., Liebman M., Helmers M., Cruse R., McDaniel M. “Contour prairie strips affect adjacent soil but have only slight effects on crops”. To be submitted to Field Crops Research.

Software

- Ward E., Anderson S., **Damiano L.**, Hunsicker M., Litzow M. bayesdfa: Bayesian Dynamic Factor Analysis (DFA) with Stan. An R package. ([CRAN](#))
- **Damiano L.**, Niemi J. yieldMaps: Yield Monitor Data Processing via the RITAS Algorithm. An R package. ([GitHub repository](#))
- **Damiano L.**, Peterson B., Weylandt M. BayesHMM: Full Bayesian Inference for Hidden Markov Models. An R package. ([GitHub repository](#))

Presentations

Talks

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|---|----------------|
| NASA JPL Uncertainty Quantification for Remote Sensing Inverse Problems , Virtual | October 2022 |
| • “Automatic Dynamic Relevance Determination for Gaussian process regression with functional inputs”. | |
| Pacific Northwest National Laboratory - ISU workshop , Virtual | August 2022 |
| • “Automatic Dynamic Relevance Determination for Gaussian process regression with functional inputs”. | |
| Los Alamos National Laboratory , Virtual | August 2022 |
| • “Non-stationary log-Gaussian Cox process for source separation in the context of the Interstellar Boundary Explorer mission”. | |
| SIAM Conference on Uncertainty Quantification , Virtual | April 2022 |
| • “Automatic Dynamic Relevance Determination for Gaussian process regressions with functional inputs”. (Slides) | |
| NASA JPL Uncertainty Quantification for Remote Sensing Inverse Problems , Virtual | October 2021 |
| • “Automatic Dynamic Relevance Determination of atmospheric states over vertical pressure grids for the MLS forward model emulation”. | |
| Los Alamos National Laboratory , Virtual | September 2020 |
| • “Emulation of Agricultural Production Systems sIMulator (APSIM).” Joint invited seminar with Jarad Niemi . (Slides) | |
| R/Finance 2019 , Chicago, IL | May 2019 |
| • “Bayesian Inference and Volatility Modeling Using Stan.” Optional tutorial with Michael Weylandt. | |
| • “Augmenting Trading Systems with Hidden Markov Models using BayesHMM.” Full talk. | |
| R/Finance 2018 , Chicago, IL | June 2018 |
| • “Bayesian Inference and Volatility Modeling Using Stan.” Optional tutorial with Michael Weylandt. (Slides) | |

- “Hierarchical Hidden Markov Models in High-Frequency Stock Markets.” Full talk. ([Slides](#))

Inter-American Statistical Conference 2017, Rosario, Argentina

October 2017

- “Daily Stock Price Forecasts in Argentina Using Hidden Markov Models.” ([Slides](#))

R/Finance 2017, Chicago, IL

May 2017

- “A Quick Introduction to Hidden Markov Models Applied to Stock Volatility.” ([Slides](#); [Notebook](#))

Posters

Conference on Applied Statistics in Agriculture and Natural Resources, Virtual

May 2021

- “Automatic Dynamic Relevance Determination of soil properties over different soil layers for yield prediction using APSIM.” ([Poster](#))

University of Arkansas 44th Annual Spring Lecture Series, Fayetteville, AR

April 2019

- “BayesHMM: Full Bayesian Inference for Hidden Markov Models.” ([Poster](#))

Research Experience

Los Alamos National Laboratory

Summer 2022

Graduate Research Assistant with Brian Weaver and David Osthus for the Interstellar Boundary Explorer LDRD. Work on spatial modeling of energetic neutral atoms sourced at the boundaries of the heliosphere via non-stationary log-Gaussian Cox processes for (i) signal estimation, and (ii) source separation between globally distributed flux and [the enhanced emission ribbon](#).

Iowa State University

2018-2022

Research Assistant for the Consortium for Cultivating Human and Naturally Regenerative Enterprises (C-CHANGE) and Foundation for Food and Agriculture Research (FFAR). Work on (i) Bayesian hierarchical spatio-temporal models, and (ii) statistical emulation of computer experiments.

Universidad Nacional de Rosario

2016-2017

Graduate thesis for the M.Sc. in Applied Statistics program.

- Title: “Evaluating Forecast Accuracy of GARCH Volatility Models Applied to Daily Stock Prices in Argentina.” ([Thesis](#); [Slides](#))
- Advisor: [María Teresa Blaconá](#).

GSoC Student for R Project for Statistical Computing

Summer 2018

- Title: “Full Bayesian Inference for Hidden Markov Models.”
- Mentors: [Brian Peterson](#) and [Michael Weylandt](#).
- [GitHub repository](#)

GSoC Student for R Project for Statistical Computing

Summer 2017

- Title: “Bayesian Hierarchical Hidden Markov Models applied to financial time series.”
- Mentors: [Brian Peterson](#) and [Michael Weylandt](#).
- [GitHub repository](#)
- [Overview](#)

Honors and Awards

- **Vince Sposito Statistical Computing Award**, Department of Statistics, ISU 2022
- **Jebe Fellowship**, Department of Statistics, ISU, 2018-2019
- **Student Travel Funding**, University of Arkansas 44th Annual Spring Lecture Series, 2019

- **Student Travel Award**, R/Finance Conference, 2019
- **Student Travel Award**, R/Finance Conference, 2018
- **Student Travel Award**, R/Finance Conference, 2017

Teaching Experience

Co-Instructor

Universidad Nacional de Rosario, Department of Statistics Spring 2018

Time Series Analysis (graduate level): Stationary ARMA Processes, Models of Non-stationary Time Series, Seasonality, Maximum Likelihood Estimation, Diagnostics and Model Selection, Forecasting, Intervention and Detection of Outliers. Introduction to State-Space Models. Instructor: M.T. Blaconá.

Teaching Assistant

Iowa State University, Department of Statistics Fall 2022

STAT 266 Introduction to Business Statistics I (undergraduate level): instructor.

Iowa State University, Department of Statistics 2018-2019

STAT 544 Bayesian Statistics (graduate level).

STAT 101 Principles of Statistics (undergraduate level): instructor of laboratory sessions.

Pontificia Universidad Católica Argentina, Department of Administration Fall 2010

Finance II (undergrad): Valuation & Capital Budgeting, Return & Risk, Capital Structure & Dividend Policy.

Professional Experience

FIRST Capital Markets, Head of Asset Management, Buenos Aires, Argentina 2015-2018

Development of quantitative strategies and deployment of GARCH for foreign exchange volatility, PCA of the yield curve, cross-sectional and time-series analysis on currency futures, Monte Carlo simulation to model delta-neutral commodity trading strategies, and hierarchical linear models for cohort analysis of credit portfolios.

FIRST Corporate Finance, Lead Structurer for ABS, Rosario, Argentina 2010-2015

Deloitte & Touche Corporate Finance Advisors prior to the spin-off in 2013. Primary responsibilities included structuring Asset-Backed Securities (ABS) as well as producing all the technical documents for the initial public offering. Quantitative aspects of the daily work included the statistical analysis of the historical performance of assets, handling databases with 100 million records, and forecasting cash flows.

Service

- Reviewer for [METRON Journal](#), [PeerJ Computer Science](#).
- Founder and leader of the Gaussian Process reading group at Iowa State University.