Postdoctoral Research
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Jessica Pavani

My research interests focus on Bayesian inference (both parametric and nonparametric), with an emphasis on modeling and computational techniques for complex or correlated data, primarily in the contexts of infectious disease modeling and spatio-temporal disease mapping. Currently, I am working on the development of complex behavioral change in epidemic models, as well as strategies to model temporal correlation in spatial random partitions.

Education

2024 **Ph.D. in Statistics**, Pontificia Universidad Católica de Chile, Chile.
Title: *Flexible spatio-temporal strategies for modeling mosquito-borne diseases.*

2017 **M.Sc. in Biostatistics**, University of València, Spain.
Title: *Gaussian state-space models for estimating population counts with MCMC and INLA methods.*

2015 **B.Sc. in Statistics**, University of São Paulo, Brazil.
Title 1: *Application of mixed models with cross-over effects in experiments with animals.*
Title 2: *Determination of the laser-induced fluorescence spectrum descriptors for the classification of citrus Huanglongbing disease.*

Experience

Current Position

2025 - **Postdoctoral Research Fellow**, Department of Mathematics and Statistics, University of Calgary, Canada.
Development of complex behavioral change in epidemic models.

Previous Positions

2016-2016 **Intern**, Identia Institute, Spain.
Application of statistical techniques for different datasets in agronomic scenario from Bayesian and frequentist perspectives.

2014-2015 **Trainee**, Estatcamp Statistical Consulting, Brazil.
Performing data analysis and report elaboration in multiple contexts (basic statistics, statistical inference, statistical process control, process capability, design of experiments, and regression analysis).
Tutoring for training in company.

2013-2013 **Intern**, Brazilian Agricultural Research Corporation, Brazil.
Application of statistical techniques in laser spectroscopy for Greening classification in citrus.

Peer-Reviewed Journal Articles

Submitted to publication

[10] **Pavani, J.**; Loschi, R. H.; Quintana, F. A.: Modeling temporal dependence in a sequence of spatial random partitions driven by spanning trees: an application to mosquito-borne diseases. arXiv:2501.04601

Published

[9] **Pavani, J.**; Quintana, F. A.: A Bayesian multivariate model with temporal dependence on random partition of areal data. *Statistics in Medicine*, 44(3-4), e10325, 2025.

[8] **Pavani, J.**; Bastos, L.S.; Moraga, P.: Joint spatial modeling of the risks of co-circulating mosquito-borne diseases in Ceará, Brazil. *Spatial and Spatio-temporal Epidemiology*, 47, 100616, 2023.

[7] **Pavani, J.**; Moraga, P.: A Bayesian joint spatio-temporal model for multiple mosquito-borne diseases. *New Frontiers in Bayesian Statistics: BAYSM 2021, Springer Proceedings in Mathematics & Statistics*, 405, 69-77, 2022.

[6] **Pavani, J.**; Cerda, J.; Gutiérrez, L.; Varas, I.; Gutiérrez, I.; Jofré, L.; Ortiz, O.; Arriagada, G.: Factors associated to the duration of COVID-19 lockdowns in Chile. *Scientific Reports*, 12(9516), 1-7, 2022.

[5] Oliveira, C.M.; **Pavani, J.**; Liu, C.; Balcells-Camps, M.; Capasso, R.; Alvim, R.O.; Mourão-Junior, C.A.; Krieger, J.E.; Pereira, A.C.: Comparing different metabolic indexes to predict type 2 diabetes mellitus in a five years follow-up cohort: The Baependi Heart Study. *PLoS One*, 17(6):e026772, 2022.

[4] Oliveira, C.M.; Rosa, F.F.; Alvim, R.O.; Mourão-Junior, C.A.; Balcells-Camps, M.; Liu, C.; **Pavani, J.**; Capasso, R.; Dias, F.A.L.; Krieger, J.E.; Pereira, A.C.: Body mass index is superior to other body adiposity indexes in predicting incident hypertension in a highly admixed sample after 10-year follow-up: The Baependi Heart Study. *The Journal of Clinical Hypertension*, 24(6), 731-737, 2022.

[3] Oliveira, C.M.; **Pavani, J.**; Krieger, J.E.; Alvim, R.O.; Balcells-Camps, M.; Mourão-Junior, C.A.; Pereira, A.C.; Liu, C.: Triglyceride glucose index as a tool to motivate early lifestyle modification in young adults at diabetes risk: The Baependi Heart Study. *Preventive Medicine Reports*, 20, 1-4, 2020.

[2] **Pavani, J.**; Alvares, D.: Statistically validating patient self-reporting questionnaires in medicine, *SAGE Research Methods: Medicine & Health Cases*, 1-19, 2020.

[1] Oliveira, C.M.; **Pavani, J.**; Krieger, J.E.; Alvim, R.O.; Mourão-Junior, C.A.; Pereira, A.C.: Body adiposity index accessing the type 2 diabetes mellitus development risk: The Baependi Heart Study. *Diabetology & Metabolic Syndrome*, 11(76), 76-80, 2019.

Conference and Workshop

[11] **Pavani, J.**; Loschi, R. H.; Quintana, F. A.: Linking spanning trees and spatial random partitions: a study of mosquito-borne disease patterns. In: BAyesian Young Statisticians Meeting (Virtual), April 7 - 11, 2025.

[10] **Pavani, J.**; Quintana, F. A.: Spatio-temporal modelling for multiple mosquito-borne diseases: a flexible Bayesian clustering approach. In: 16th International Conference of the ERCIM WG on Computational and Methodological Statistics, Berlin, Germany, December 16 - 18, 2023.

[9] **Pavani, J.**; Quintana, F. A.: Spatio-temporal modeling: a flexible Bayesian approach. In: XIX Spanish Biometric Conference & VIII Ibero-American Biometric Meeting, Vigo, Spain, June 27 - 30, 2023.

[8] **Pavani, J.**; Quintana, F. A.: A flexible Bayesian approach for spatio-temporal epidemiology. In: 13th International Conference on Bayesian Nonparametrics, Puerto Varas, Chile, October 24 - 28, 2022.

[7] **Pavani, J.**; Moraga, P.: Modeling multiple mosquito-borne diseases: a spatio-temporal approach. In: Workshop de Estadística: Contribuciones de Posgrado (Virtual), December 15 - 17, 2021.

[6] **Pavani, J.**; Bastos, L; Moraga, P.: Spatial modelling for mosquito-borne diseases: a joint approach. In: Meeting of the Royal Statistical Society of Belgium, Liège, Belgium, October 21 - 22, 2021.

[5] **Pavani, J.**; Bastos, L; Moraga, P.: A joint spatial modeling for mosquito-borne diseases in Brazil. In: Congreso Latinoamericano de Sociedades de Estadística (Virtual), October 18 - 21, 2021.

[4] **Pavani, J.**; Moraga, P.: A Bayesian joint spatio-temporal model for multiple mosquito-borne diseases. In: BAyesian Young Statisticians Meeting (Virtual), September 1 - 3, 2021.

[3] **Pavani, J.**; Armero, C.; Conesa, D.: Different Bayesian computational methods for Gaussian state-space models. In: Meeting of the Chilean Society of Statistics, Puerto Varas, Chile, October 21 - 25, 2019.

[2] **Pavani, J.** and Alvares, D.: Bayesian classifier as support for an intelligent tutoring system. In: València International Bayesian Analysis Summer School, Burjassot, Spain, July 16 - 20, 2018.

[1] **Pavani, J.**; Armero, C.; Conesa, D.: Dealing with MCMC and INLA approaches in Gaussian state-space models for dynamic populations. In: València International Bayesian Analysis Summer School, Burjassot, Spain, July 17 - 21, 2017.

Invited Talks

Jan. 2025 *Exploring temporal dynamics in spatial random partitions driven by spanning trees: an application to mosquito-borne diseases.* In: Workshop in Bayesian Methods for Health Research - Federal University of Minas Gerais, Belo Horizonte, Brazil.

Jun. 2017 *Exploring Bayesian approaches to Gaussian state-space models for dynamic populations.* In: Seminari PREDOC - University of València, Burjassot, Spain.

Nov. 2013 *Determinação de descritores do espectro de fluorescência induzida por laser para classificação da doença Huanglongbing de citros.* In: II Statistics Workshop - Institute of Mathematics and Computer Science - University of São Paulo, São Carlos, Brazil.

Grants and External Funding

[6] Travel grant - 14th International Conference on Bayesian Nonparametrics, Los Angeles, United States, June 23 - 27, 2025.

[5] Travel grant - XIX Spanish Biometric Conference & VIII Ibero-American Biometric Meeting, Vigo, Spain, June 27 - 30, 2023.

[4] Ph.D. internship awarded by the Vicerrectoría de Investigación of Pontificia Universidad Católica de Chile.

Held at the Federal University of Minas Gerais, Brazil, under supervision of Rosangela Loschi, Apr/2022 - Sep/2022.

[3] Ph.D. internship awarded by the King Abdullah University of Science and Technology.

Held at the King Abdullah University of Science and Technology, Saudi Arabia (Virtual), under supervision of Paula Moraga, May/2021 - Jul/2021.

[2] FONDECYT COVID0248 - "Estudio epidemiológico observacional para evaluar el efecto de medidas de control gubernamentales sobre la dinámica espacio-temporal de COVID19 en Chile", 2020 - 2021.

[1] Ph.D. scholarship awarded by the Vicerrectoría de Investigación of Pontificia Universidad Católica de Chile, 2019 - 2022.