

# Felipe Osorio

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📄 <https://faosorios.github.io/>

## Research Interests

Applied statistics, Generalized Linear Models, Inference functions, Likelihood-based inference, Longitudinal data analysis. Statistical diagnostics.

## Education

- 2006 **D. Sc. in Statistics**, *Universidade de São Paulo*, Brazil.  
Thesis topic: *Diagnóstico de Influência em Modelos Elípticos com Efeitos Mistos*.  
Advisor: Professor Gilberto A. Paula.
- 2001 **Engineer in Statistics**, *Universidad de Valparaíso*, Chile.  
Topic: *Detección de Puntos de Cambio en Modelos de Regresión Lineal t-independiente*.  
Advisor: Professor Manuel Galea.

## Book

- 90 citations Vallejós, R., **Osorio, F.**, Bevilacqua, M. (2020). *Spatial Relationships Between Two Georeferenced Variables: With Applications in R*. Springer, Cham. doi: [10.1007/978-3-030-56681-4](https://doi.org/10.1007/978-3-030-56681-4)

## Publications

- Ogueda, A., **Osorio, F.** (2025). Influence diagnostics for ridge regression using the Kullback-Leibler divergence. *Statistical Papers* **66**, 85. Q2
- 2 citations Acosta, J., Vallejos, R., Ellison, A. M., **Osorio, F.**, de Castro, M. (2024). Comparing two spatial variables with the probability of agreement. *Biometrics* **80** (1), ujae009. Q1
- 4 citations **Osorio, F.**, Gárate, Á., Russo, C.M. (2024). The gradient test statistic for outlier detection in generalized estimating equations. *Statistics & Probability Letters* **209**, 110087. Q3
- 2 citations **Osorio, F.**, Galea, M., Henríquez, C., Arellano-Valle, R. (2023). Addressing non-normality in multivariate analysis using the t-distribution. *ASTA Advances in Statistical Analysis* **107**, 785-813. Q2
- 16 citations **Osorio, F.**, Vallejos, R., Barraza, W., Ojeda, S.M., Landi, M.A. (2022). Statistical estimation of the structural similarity index for image quality assessment. *Signal, Image and Video Processing* **16**, 1035-1042. Q2
- 3 citations Vidal, G., Yuz, J., Vallejos, R., **Osorio, F.** (2022). Point-process modeling and divergence measures applied to the characterization of passenger flow patterns of a metro system. *IEEE Access* **10**, 26529-26540. Q1
- 6 citations Acosta, J., Alegría, A., **Osorio, F.**, Vallejos, R. (2021). Assessing the effective sample size for large spatial datasets: A block likelihood approach. *Computational Statistics & Data Analysis* **162**, 107282. Q1
- Cruðu, F., **Osorio, F.** (2020). Bilinear form test statistics for extremum estimation. *Economics Letters* **187**, 108885. Q2
- 13 citations Leal, C., Galea, M., **Osorio, F.** (2019). Assessment of local influence for the analysis of agreement. *Biometrical Journal* **61** (4), 955-972. Q1

- Acevedo, C.A., Tomic, G., Santander, R. Creixell, W., **Osorio, F.**, Sánchez, E. (2016). A Chemometrics approach to analysis volatile molecules released by post-mortem bovine fast-twitch muscles. *CyTA - Journal of Food* **14** (3), 399-404. Q2
- 9 citations Acosta, J., **Osorio, F.**, Vallejos, R. (2016). Effective sample size for line transect sampling models with an application to marine macroalgae. *Journal of Agricultural, Biological, and Environmental Statistics* **21** (3), 407-425. Q2
- 11 citations **Osorio, F.** (2016). Influence diagnostics for robust P-splines using scale mixture of normal distributions. *Annals of the Institute of Statistical Mathematics* **68** (3), 589-619. Q2
- 11 citations Vallejos, R., **Osorio, F.**, Mancilla, D. (2015). The codispersion map: a graphical tool to visualize the association between two spatial variables. *Statistica Neerlandica* **69** (3), 298-314. Q2
- 43 citations Vallejos, R., **Osorio, F.** (2014). Effective sample size of spatial process models. *Spatial Statistics* **9**, 66-92. Q2
- 78 citations Meza, C., **Osorio, F.**, De la Cruz, R. (2012). Estimation in nonlinear mixed-effects models using heavy-tailed distributions. *Statistics and Computing* **22** (1), 121-139. Q1
- 24 citations **Osorio, F.**, Paula, G.A., Galea, M. (2009). On estimation and influence diagnostics for the Grubbs' model under heavy-tailed distributions. *Computational Statistics & Data Analysis* **53** (4), 1249-1263. Q1
- Cademartori, D., Navia, R., Galea, M., **Osorio, F.** (2008). Prediction of the economic activity from the short and long-term interest rate differential: New evidences in Chile and the United States of America cases. *Applied Economics Letters* **15** (9), 707-712. Q3
- 79 citations **Osorio, F.**, Paula, G.A., Galea, M. (2007). Assessment of local influence in elliptical linear models with longitudinal structure. *Computational Statistics & Data Analysis* **51** (9), 4354-4368. Q1
- 24 citations **Osorio, F.**, Galea, M. (2006). Detection of a change-point in Student-*t* linear regression models. *Statistical Papers* **47** (1), 31-38. Q2

### Submitted papers

Gárate, Á., **Osorio, F.**, Crudu, F. An invariant modification of the bilinear form test.

Jaques, A., Schwarzenberg, C., **Osorio, F.**, Kohnenkamp, E., Veliz, M., Aracena, A. Best practices in kinetic parameter estimation via regression in ore leaching processes.

Vallejos, R., **Osorio, F.**, Ferrer, C. A new coefficient to measure agreement between continuous variables. [arXiv:1611.05289](https://arxiv.org/abs/1611.05289)

Vallejos, R., **Osorio, F.**, Vidal, S., Britos, G. Optimized imaging prefiltering for enhanced image segmentation. [arXiv:2508.03653](https://arxiv.org/abs/2508.03653)

### Works in preparation

Avello, P., Tapia, A., **Osorio, F.**, Galea, M. Local influence in ordinary differential equation models.

Bazurto, Z., **Osorio, F.**, Galarza, C., Galea, M. Assessing influence in generalized linear models based on maximum  $L_q$ -likelihood estimation.

**Osorio, F.**, Galea, M., Giménez, P. A robust approach for generalized linear models based on maximum  $L_q$ -likelihood procedure. [arXiv:2408.04176](https://arxiv.org/abs/2408.04176)

**Osorio, F.**, Galea, M., Palacios, F. Agreement assessment between two measurement systems using robust P-splines.

**Osorio, F.**, Tapia, A. An EM-based approach for influence diagnostics in LAD regression.

**Osorio, F.**, Tapia, A., Liu, S. Assessment of local influence in LAD regression.

Tapia, A., Giampaoli, V., **Osorio, F.**, Morales, B., Mendez-Bustos, P. Novel approaches for validating ordinal regression models and their applications to the study of suicidal behavior.

[arXiv preprint](#)

23 citations Vallejós, R., **Osorio, F.**, Cuevas, F. (2016). SpatialPack: Computing the association between two spatial processes. [arXiv:1611.05289](#)

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## Conference Proceedings

**Osorio, F.** (2011). Smoothing parameter selection and outliers accommodation for smoothing splines. In: *Proceedings of the 58th World Statistics Congress of the International Statistical Institute*, Dublin, Ireland. Session CPS008, 6037-6042.

De la Cruz, R., Eyheramendy, S., Meza, C., **Osorio, F.** (2010). Exact estimation procedures in a spatial mixed-effects probit model with binary outcomes. In: *Joint Statistical Meetings Proceedings*, Statistical Computing Section. Alexandria, VA: American Statistical Association. 3629-3637.

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## Software

3 citations **Osorio, F.**, Ogueda, A. (2025). *fastmatrix: Fast computation of some matrices useful in statistics*. R package version 0.6-4. Total downloads: **136K**  
doi: [10.32614/CRAN.package.fastmatrix](https://doi.org/10.32614/CRAN.package.fastmatrix)

25 citations **Osorio, F.** (2019). *heavy: Robust estimation using heavy-tailed distributions*. R package version 0.38.196. Total downloads: **58K**  
URL: [CRAN.R-project.org/package=heavy](https://CRAN.R-project.org/package=heavy)

1 citation **Osorio, F.** (2025). *india: Influence diagnostics in statistical models*. R package version 0.1-1. Total downloads: **6973**  
doi: [10.32614/CRAN.package.india](https://doi.org/10.32614/CRAN.package.india)

7 citations **Osorio, F.**, Wołodźko, T. (2025). *L1pack: Routines for L1 estimation*. R package version 0.60. Total downloads: **105K**  
doi: [10.32614/CRAN.package.L1pack](https://doi.org/10.32614/CRAN.package.L1pack)

7 citations **Osorio, F.** (2024). *MVT: Estimation and testing for the multivariate t-distribution*. R package version 0.3-81. Total downloads: **40K**  
doi: [10.32614/CRAN.package.MVT](https://doi.org/10.32614/CRAN.package.MVT)

99 citations **Osorio, F.**, Vallejos, R. (2024). *SpatialPack: Tools for assessment of the association between two spatial processes*. R package version 0.4-1. Total downloads: **133K**  
doi: [10.32614/CRAN.package.SpatialPack](https://doi.org/10.32614/CRAN.package.SpatialPack)

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## Grants

- 2024,2025 Principal Investigator UTFSM grant PI\_LIR\_24\_02  
*Métodos robustos para cuantificar la concordancia entre dos instrumentos de medición.*
- 2024,2025 Co-investigator STIC AmSud grant BIO-CIVIP 23-STIC-02  
*BIOlogical Control of Insect Vectors and Insect Pests.*
- 2020,2021 Co-investigator UTFSM grant PI-LIR-2020-20  
*Estimation of the image similarity index using a regression model with errors in the response variable.*

- 2020,2021 Co-investigator MATH-AmSud grant 20-MATH-03  
*Concordance and covariance functions for environmental modelling.*
- 2018,2019 Co-investigator project Oliver Espiniza DGD-USM  
*Incorporación de Medios Audiovisuales en el Proceso de Enseñanza y Aprendizaje del curso de Probabilidad y Estadística en la UTFSM.*
- 2018,2019 Principal Investigator UTFSM grant PI-LI-19-11  
*An adaptive approach for robust estimation in GLM.*
- 2017 Co-investigator DI project Investigación Innovadora Interdisciplinaria (PUCV)  
*Inteligencia artificial para el monitoreo de la estabilidad de depósitos de relaves.*  
with Dr. Gabriel Villavicencio (PUCV) and collaborators.
- 2014,2015 Principal Investigator UTFSM grant 12.14.14.  
*Influencia local y análisis de residuos para funciones de inferencia cuadráticas.*
- 2014-2017 Principal Investigator FONDECYT grant 1140580  
*Influence diagnostics and residual analysis in inference functions with applications to longitudinal data.*
- 2011-2014 Associate Researcher CONICYT grant 791100007.  
*Fortalecimiento del Área Estadística en el Departamento de Matemática de la USM.*  
Coordinator: Dr. Ronny Vallejos (USM).
- 2009-2011 Co-Investigator PROSUL grant 490429/2008-4, CNPq-Brazil  
*Desenvolvimento de métodos de diagnóstico e teoria assintótica em modelos de regressão.*  
with Dr. Francisco Cysneiros (UFPE) and collaborators.
- 2007-2010 Principal Investigator FONDECYT grant 11075071  
*Robust estimation and influence diagnostics in mixed-effect models.*
- 2006-2008 Co-Investigator CNPq-Brazil 471296/2006-6  
*Diagnóstico de influência em modelos de regressão de contornos elípticos.*  
with Dr. Gilberto A. Paula (USP) and collaborators.

## Students

### Doctoral

- 2025 Ángelo Gárate, Doctor in Statistics at PUC (co-advisor Dr. M. Galea).
- 2024 Claudio Henríquez, Doctor in Statistics at PUC (co-advisor Dr. M. Galea).
- 2017 Jonathan Acosta, Doctor in Mathematics at UTFSM (co-advisor Dr. R. Vallejos).

### Master

- 2025 Francine Palacios, Master in Mathematics at UTFSM.
- 2021 Alonso Ogueda, Master in Mathematics at UTFSM.
- 2021 Carlos Schwarzenberg, Master in Mathematics at UTFSM.
- 2017 Paula Guerrero, Master in Statistics at PUCV.
- 2016 Jessenia Cortés, Master in Statistics at PUCV.
- 2013 Francisco Cuevas, Master in Mathematics at UTFSM (co-advisor Dr. R. Vallejos).
- 2012 Francisco Contreras, Master in Statistics at UV (co-advisor Dr. C. Meza).
- 2012 Rubén Miranda, Master in Statistics at UV.
- 2011 Patricio Maturana, Master in Statistics at UV.

- 2011 Marcelo Torres, Master in Statistics at UV (co-advisor Dr. M. Galea).
- 2009 Patricio Videla, Master in Statistics at PUCV.

### Undergraduate

- 09/24-today Francisco Nilsson, Mathematical Engineer at UTFSM (co-advisor Dr. R. Vallejos).
- 2024 Rodrigo Pizarro, Mathematical Engineer at UTFSM (co-advisor Dr. A. Veloz).
- 2024 Fabián Rubilar, Mathematical Engineer at UTFSM.
- 2021 Pablo Huenchulao, Mathematical Engineer at UTFSM.
- 2021 Gabriel Vidal, Mathematical Engineer at UTFSM (co-advisor Dr. J. Yuz and Dr. R. Vallejos).
- 2018 Eileen Labalobich, Bachelor of Science in Statistics at PUCV.
- 2018 Alonso Ogueda, Mathematical Engineer at UTFSM.
- 2017 Diego Estay, Bachelor of Science in Statistics at PUCV.
- 2017 Fernando Salazar, Bachelor of Science in Statistics at PUCV.
- 2016 Carlos Schwarzenberg, Mathematical Engineer at UTFSM.
- 2015 Jessica García, Bachelor of Science in Statistics at PUCV.
- 2015 Agustín Uribe, Mathematical Engineer at UTFSM.
- 2014 Claudio Henríquez, Mathematical Engineer at UTFSM.
- 2013 Jonathan Acosta, Mathematical Engineer at UTFSM (co-advisor Dr. R. Vallejos).
- 2012 Denisse Suarez, Engineer in Statistics at UV.
- 2012 Rodrigo Toledo, Engineer in Statistics at UV.
- 2012 Natalia Vargas, Engineer in Statistics at UV.
- 2009 Orlando Cataldo, Engineer in Statistics at UV.
- 2009 Joel Herrera, Engineer in Statistics at UV.

### Service

- 01/19-03/25 Associate Editor for the Chilean Journal of Statistics.
- 06/21-12/24 Member of the University Committee for Court of Honor, UTFSM.
- 04/16-12/18 Managing Editor for the Chilean Journal of Statistics.

### Reviewed articles for:

Automatica ◊ BMC Medical Research Methodology ◊ Brazilian Journal of Probability and Statistics ◊ Chilean Journal of Statistics ◊ Colombian Journal of Statistics ◊ Communications in Statistics: Theory and Methods ◊ Computational Statistics & Data Analysis ◊ Data Science in Science ◊ Environmental and Ecological Statistics ◊ Expert Systems With Applications ◊ Hacettepe Journal of Mathematics and Statistics ◊ Journal of Agricultural, Biological and Environmental Statistics ◊ Journal of Applied Statistics ◊ Journal of Multivariate Analysis ◊ Journal of Statistical Computation and Simulation ◊ MathSciNet: Mathematical Reviews ◊ Methodology: European Journal of Research Methods for the Behavioral and Social Sciences ◊ Natural Resource Modeling ◊ Pakistan Journal of Statistics ◊ Research in Statistics ◊ Sankhyā, Series A ◊ Spatial Statistics ◊ Statistical Methodology ◊ Statistical Papers ◊ Stochastic Environmental Research and Risk Assessment ◊ Structural Equation Modeling: A Multidisciplinary Journal ◊ TEST ◊ The Journal of Open Source Software

Reviewed book for:

- SpringerBriefs in Statistics - ABE

Funding:

- Chilean National Institute of Science and Technology (CONICYT)
- Research and Development Directorate, Universidad Austral de Chile.

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## Academic databases

- ORCID: [orcid.org/0000-0002-4675-5201](https://orcid.org/0000-0002-4675-5201)
- ResearcherID: [S-4213-2019](https://pubs.academia.edu/S-4213-2019)
- Google Scholar, ID: [IU5Z39UAAA](https://scholar.google.com/citations?user=IU5Z39UAAA)J

Viña del Mar, December 13, 2025