Javier González-Delgado

Mathematician - Statistician

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Professional background

École Nationale de la Statistique et de l'Analyse de l'Information (ENSAI) — *Rennes (France)*

Assistant professor in Statistics — *Jan. 2025 - Present*

McGill University — *Montréal (Canada)*

Visiting professor — *May '25 - Oct. '25, Jul. '26 - Sep. '26*

Postdoctoral Researcher — *Dec. 2023 - Dec. 2024*

Research conducted in the Simon Gravel group at the Department of Human Genetics.

International Agency for Research on Cancer (IARC-WHO) — *Lyon (France)*

Master Internship — *Mar. 2020 - Aug. 2020*

Supervised by Vivian Viallon (IARC-WHO), Hadrien Charvat (IARC-WHO) and Grégoire Rey (INSERM). [thesis]

Academic background

University of Toulouse III - Paul Sabatier — *Toulouse (France)*

PhD in Applied Mathematics — *Oct. 2020 - Oct. 2023*

- Manuscript: Statistical methods for the structural analysis of highly flexible proteins. [thesis]
- Supervised by Pierre Neuvial at the Toulouse Institute of Mathematics (IMT) and by Juan Cortés at the Laboratory for Analysis and Architecture of Systems (LAAS-CNRS).
- Funded by the LabEx CIMI.

University of Grenoble-Alpes — *Grenoble (France)*

Master in Statistics and Data Science — *Sep. 2019 - Aug. 2020*

- Grade Point Average: 16.4/20.

University of Oviedo — *Oviedo (Spain)*

Bachelor in Mathematics — *Sep. 2014 - Jul. 2019*

- Grade Point Average: 8.39/10.
- Bachelor's Thesis in Geometry and Topology of Manifolds. [thesis]

Bachelor in Physics

- Grade Point Average: 8.576/10.
- Bachelor's Thesis in C^* Algebras and their applications to Quantum Mechanics. [thesis]
- Erasmus+ program at University of Grenoble-Alpes (Sep. 2016 - Jun. 2017).

Publications and communications

Preprints and submitted manuscripts

· González-Delgado J, Serdiuk A, Krim-Yee V and Gravel, S: *Time-continuous Markov chains to describe genetic transmission and their application to model local ancestry via phase-type distributions*, 2026.

· González-Delgado J, Cortés J, Barducci A, Paloni, M: *Evidence for the Progressive Improvement of All-Atom Force Fields in Reproducing Local Conformational Preferences of Flexible Peptides*, 2025, bioRxiv:12.22.695171. [bioRxiv]

Journal papers

[JASA] González-Delgado J, Deronzier M, Cortés J, Neuvial P: *Post-clustering Inference under Dependence*, J. Amer. Statist. Assoc., 1–13, 2026. [url]

[PNAS] González-Delgado J, Mier P, Bernadó P, Neuvial P, Cortés J: *The dependence of the amino acid backbone conformation on the translated synonymous codon is not statistically significant*, Proc. Natl. Acad. Sci. U.S.A., 122(24): e2503264122, 2025. [url]

[Bioinfo] González-Delgado J, Bernadó P, Neuvial P, Cortés J: *Weighted families of contact maps to characterize conformational ensembles of (highly-)flexible proteins*, Bioinformatics, 40(11): btae627, 2024. [url]

[EJS] González-Delgado J, González-Sanz A, Cortés J, Neuvial P: *Two-sample goodness-of-fit tests on the flat torus based on Wasserstein distance and their relevance to structural biology*, Electron. J. Statist., 17(1): 1547–1586, 2023. [url]

[JMB] González-Delgado J, Sagar A, Zanon C, Lindorff-Larsen K, Bernadó P, Neuvial P, Cortés J: *WASCO: A Wasserstein-based statistical tool to compare conformational ensembles of intrinsically disordered proteins*, Journal of Molecular Biology, 435(14): 168053, 2023. [url]

[JSB] González-Delgado J, Bernadó P, Cortés J, Neuvial P: *Statistical proofs of the interdependence between nearest neighbor effects on polypeptide backbone conformations*. Journal of Structural Biology, 214(4): 107907, 2022. [url]

Scientific dissemination (in French)

[MATAPLI] González-Delgado J: *Statistique pour démêler le désordre des protéines*. MATAPLI, 138, 49-63, 2025. [url]

Communications

Invited talks and lectures

Inference after human genetic clustering

- MASCOT-NUM: Statistics and uncertainty quantification for environmental and health applications, Rennes, 2026.

Post-clustering inference under dependence

- Journées of the SMAI-MAS group (Modélisation Aléatoire et Statistique). Poitiers, Aug. 2024.

WASCO: A Wasserstein-based statistical tool to compare conformational ensembles of intrinsically disordered proteins

- Lecture and practical session in Algorithms in Structural Bioinformatics (AlgoSB) winter school: “Intrinsic Disorder in Proteins”. Institute of Scientific Studies of Cargèse, Corsica, Nov. 2022.

Selected conferences and seminars

Inference after human genetic clustering

- SMPGD (Statistical Methods for Post Genomic Data) 2026. Grenoble, Jan. 2026.

Post-clustering inference under dependence

- 13th International Conference on Multiple Comparison Procedures. Temple University. Philadelphia, Aug. 2025.
- International Seminar on Selective Inference. Online, Feb. 2024.
- IRMAR (Institut de Recherche Mathématique de Rennes) statistics seminar. Rennes, Oct. 2023.

Statistical methods for the investigation of highly-flexible proteins

- Centre de Biologie Structurale (CBS) seminar. Montpellier, May 2023.

WASCO: A Wasserstein-based statistical tool to compare conformational ensembles of intrinsically disordered proteins

- GGMM (French Graphical and Molecular Modelling Group) 2023 - Young Modellers Conference, Toulouse, May 2023.

Goodness-of-fit tests on the flat torus based on Wasserstein distance and their relevance to structural biology

- GdR ISIS meeting on Optimal Transport and Statistical Learning. Institut Henri Poincaré, Paris, Nov. 2021.
- 52nd Journées de Statistiques of the French Society of Statistics (SFdS), Côte d’Azur University, Nice, Jun. 2021.

Scientific dissemination

- How to estimate cancer survival (an overview). Dissemination for non-statisticians. IMT PhD seminar. Toulouse, Mar. 2022.

Software

- **tracts** (Python package). Modeling genomic ancestry patterns, with sex-biased migration and X-chromosome admixture. [url]
- **PCIdep** (R package). Post-clustering inference under arbitrary dependence between features and observations. [url]
- **manifoldtest** (R package). Testing independence between manifold-valued data using distance covariance. [url]
- **torustest** (R package). Two-sample goodness-of-fit testing on the two-dimensional torus using optimal transport. [url]
- **WARIO** (Jupyter notebook). Characterizing intrinsically disordered protein ensembles as weighted families of contact maps. [url]
- **WASCO** (Jupyter notebook). Wasserstein-based comparison of ensembles of intrinsically disordered proteins. [url]

Funded projects

- *Statistics to unravel randomness in Biology*. Allocation d'Installation Scientifique by Rennes Métropole (2025-2027).

Advising

PhD students

- Wandrille Buchy (at ENSAI, Oct. 2026 -). *A Statistical Framework for Describing Sequence and Structural Features of Intrinsically Disordered Proteins*. Co-supervised with Sébastien Da Veiga and Juan Cortés.

Master students

- Thu Trang Le (at LAAS, Jun. 2026 - Aug. 2026). M1 internship. Co-supervised with Juan Cortés.
- Jasmin Neveu (at McGill University, May 2026 - Aug. 2026). M1 internship. Co-supervised with Simon Gravel.
- Wandrille Buchy (at ENSAI, Jan. 2026 - Jul. 2026). M2 internship. Co-supervised with Juan Cortés.
- Flavie Kolb (at LAAS, Jun. 2022 - Sep. 2022). M1 internship. Co-supervised with Christophe Zanon and Juan Cortés.

Undergraduate students

- Tina Ding (at McGill University, Sep. 2025 - Dec. 2025). Co-supervised with Simon Gravel.
- Supervision of ENSAI students in research initiation projects (7 students, 2025 -).

Teaching

ENSAI

Rennes (France)

- Omics data analysis. Lectures (Cours): 18h/year, Practical works (TP): 18h/year (2025 - 2027).
- Unsupervised classification. Lectures (Cours): 11h/year (2025 - 2027).

Toulouse III - Paul Sabatier University

Toulouse (France)

Bachelor in Mathematics

- Set theory I. Tutorials (TD): 14h/year (2022 - 2023).
- Linear Algebra I. Lectures (Cours): 28h (2023), Lectures and tutorials (Cours-TD): 32h/year (2020 - 2022).
- Foundations of Mathematics. Tutorials (TD): 30h/year (2020 - 2022).
- Statistical Inference. Practical works (TP): 13h/year (2021 - 2023).

Other activities

Review activities

- **For journals in Mathematics/Statistics**: Bernoulli (2026), Journal of the American Statistical Association (2024), Journal of Multivariate Analysis (2026, 2024), Biostatistics (2024), Electronic Journal of Statistics (2022).
- **For journals in Biology**: Nucleic Acids Research (2026), Protein Science (2023).

Conference organization

- *11th Channel Network Conference (CNC2027)*. Rennes, May 2027 (organizing committee).
- *Statistics, exposome and environmental health*. Rennes, Jun. 2026 (organizing committee) [url].

Local scientific animation

- Participation in the data art exhibition *Ce qui change. Ce qui résiste !* in collaboration with artist Stéphane Maguet. ENSAI (2026). [url]
- Participation in the ENSAI open house (*Journées Portes Ouvertes*) (2026).
- Training of *classes préparatoires* teachers (Stages Liesse) at ENSAI (2026).
- Co-organizer of the IMT PhD seminar (2021 - 2023). With Viviana Grasselli and Corentin Kilque.
- Co-organizer of the IMT PhD Statistics and Optimization seminar (2021 - 2023). With Dominique Bontemps.
- Co-manager of *Les maths à Toulouse* Twitter account (IMT, EUR MINT and Labex CIMI). (2021 - 2023). With Viviana Grasselli and Isabelle Guichard.

Awards

2023	**PhD thesis award**, Prix de thèse Jacques Neveu from the Société de Mathématiques Appliquées et Industrielles (SMAI) - MAS group.	*France*
2014	**Awarded**, Secondary school distinction award. 9.94/10.	*Avilés (Spain)*
2014	**Awarded**, Merit-based grant after University entrance examination. 13.464/14.	*Asturias (Spain)*

Language skills

Spanish	Mother tongue
English	C1 level certificate (CEFR)
French	C1 level certificate (CEFR)