

# Javier González Delgado

MATHEMATICIAN - STATISTICIAN

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*"It is true that a mathematician who is not somewhat of a poet, will never be a perfect mathematician"*

## Professional background

### McGill University

POSTDOCTORAL RESEARCHER

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

Montréal (Canada)

Dec. 2023 - Present

## Academic background

### University of Toulouse III - Paul Sabatier

PHD IN APPLIED MATHEMATICS

- Manuscript: Statistical methods for the structural analysis of highly flexible proteins. [HAL]
- 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.

Toulouse (France)

Oct. 2020 - Oct. 2023

### University of Grenoble-Alpes

MASTER IN STATISTICS AND DATA SCIENCE

- Grade Point Average: 16.4/20.

Grenoble (France)

Sep. 2019 - Aug. 2020

### University of Oviedo

BACHELOR IN MATHEMATICS

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

Oviedo (Spain)

Sep. 2014 - Jul. 2019

BACHELOR IN PHYSICS

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

## Publications and communications

### PREPRINTS AND SUBMITTED MANUSCRIPTS

- 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, 2024 bioRxiv 2022.11.29.518303. [bioRxiv]
- González-Delgado J, Cortés J, Neuvial P: Post-clustering Inference under Dependency, 2023 arXiv:2310.11822. [arXiv]

### JOURNAL PAPERS

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

## COMMUNICATIONS

### School lectures

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, France. November 2022.

### Conferences and seminars

POST-CLUSTERING INFERENCE UNDER DEPENDENCY

- Journées of the SMAI-MAS group (Modélisation Aléatoire et Statistique). Poitiers, August 2024.
- International Seminar on Selective Inference. Online, February 2024.
- IRMAR (Institut de Recherche Mathématique de Rennes) statistics seminar. Rennes, France. October 2023.

STATISTICAL METHODS FOR THE INVESTIGATION OF HIGHLY-FLEXIBLE PROTEINS

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

GOODNESS-OF-FIT TESTS ON THE FLAT TORUS BASED ON WASSERSTEIN DISTANCE AND THEIR RELEVANCE TO STRUCTURAL BIOLOGY

- Journée toulousaine "Statistique pour la Biologie", INRAE center Occitanie-Toulouse. November 2022.
- 14th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2021), King's College London, December 2021.
- IRMAR PhD Probability and Statistics seminar, Rennes, France, November 2021.
- GdR ISIS meeting on Optimal Transport and Statistical Learning, Institut Henri Poincaré, November 2021.
- 52th Journées de Statistiques of the French Society of Statistics (SFdS), Côte d'Azur University, Nice, France, June 2021.

### Scientific dissemination

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

## Pre-doctoral research experience

### International Agency for Research on Cancer (World Health Organization)

Lyon (France)

MASTER INTERNSHIP 'NET SURVIVAL AND COHORT DATA'

Mar. 2020 - Aug. 2020

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

## Advising

MASTER (M1) INTERNSHIP (4MA INSA TOULOUSE)

- Flavie Kolb. *Construction et analyse statistique d'une base de données exhaustive de fragments à trois résidus extraits de structures protéiques*. June 2022 - September 2022. With Christophe Zanon (LAAS) and Juan Cortés (LAAS).

## Teaching

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### Toulouse III - Paul Sabatier University

*Toulouse (France)*

#### BACHELOR IN MATHEMATICS

- Set theory I. Tutorials (TD). 28h, 2022 - 2023.
- Linear Algebra I. Lectures (Cours): 28h, Lectures and tutorials (Cours-TD): 64h. 2020 - 2023.
- Mathematics I. Tutorials (TD). 60h, 2020 - 2022.

#### BACHELOR IN STATISTICS AND DECISION INFORMATICS

- Statistical Inference. Practical works (TP). 25h, 2021 - 2023.

## Other activities

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### Review activities

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

### Local scientific animation

- Co-organizer of the IMT PhD seminar. September 2021 - June 2023. With Viviana Grasselli and Corentin Kilque.
- Co-organizer of the IMT PhD Statistics and Optimization seminar. September 2021 - June 2023. With Dominique Bontemps.
- Co-manager of *Les maths à Toulouse* Twitter account (IMT, EUR MINT and Labex CIMI). September 2021 - June 2023. With Viviana Grasselli and Isabelle Guichard.

## Honors & Awards

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

## Programming skills

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**Programming languages** Python, R.  
**Platforms** Windows, Ubuntu.  
**Tools**  $\text{\LaTeX}$ , Office Suite.

## Language skills

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