

Javier González Delgado

MATHEMATICIAN - STATISTICIAN

740 Dr Penfield Ave, Room 7209 Montréal, Québec, Canada, H3A 0G1

✉ javier.gonzalezdelgado@mcgill.ca 🌐 gonzalez-delgado.github.io 📱 gonzalez-delgado 📺 javiergonde

"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.

University of Grenoble-Alpes

ERASMUS+ MOBILITY PROGRAMME

- Courses in Licence 3 Physique and Master 1 Physique.

Grenoble (France)

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, Bernadó P, Neuvial P, Cortés J: *WARIO: Weighted families of contact maps to characterize conformational ensembles of (highly-)flexible proteins*, 2024. [preprint]
- González-Delgado J, Cortés J, Neuvial P: *Post-clustering Inference under Dependency*, 2023 arXiv:2310.11822. [arXiv]

JOURNAL PAPERS

[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

- International Seminar on Selective Inference. Online, Feb 2024.
- IRMAR (Institut de Recherche Mathématique de Rennes) statistics seminar. Rennes, France. Oct 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.

Schools and workshops

Algorithms in Structural Bioinformatics (AlgoSB) winter school.

INTRINSIC DISORDER IN PROTEINS

I.S.S. of Cargèse (France)

November 2022

Algorithms in Structural Bioinformatics (AlgoSB) winter school.

MACHINE LEARNING METHODS TO ANALYZE AND PREDICT PROTEIN STRUCTURE, DYNAMICS AND FUNCTION

CIRM, Marseille (France)

November 2021

Further research experience

International Agency for Research on Cancer (World Health Organization)

MASTER BIOSTATISTICS INTERNSHIP ‘NET SURVIVAL AND COHORT DATA’

Lyon (France)

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

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.

BACHELOR IN HIGHER EDUCATION AND RESEARCH ON MATHEMATICS

- Topology. Teaching assistant for tutorials (Colles). 2h, 2020 - 2021.

Other activities

Review activities

- **For journals in Statistics:** 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

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)

Programming skills

Programming languages Python, R.

Platforms Windows, Ubuntu.

Tools \LaTeX , Office Suite.

Language skills

Spanish Mother tongue

English C1 level certificate (CEFR)

French C1 level certificate (CEFR)