

Diala Hawat

Ph.D. student, Lebanese, Uruguayan

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Research interests

Keywords Spatial point processes, hyperuniformity, Monte Carlo methods, simulation algorithms, computational statistics, gravitational allocations.

Education

2020–present **Doctorate**, *probability and statistics, MADIS-631 doctoral college*, CRIStAL- SigMA team, University of Lille, MAP5, University Paris Cité, (France).

Title: Stochastic processes for numerical integration.

Supervisors: Rémi Bardenet and Raphaël Lachièze-Rey.

2019–2020 **Master 2**, *mathematics, modeling, and machine learning*, University Paris Cité, (Paris, France).

2018–2019 **Master 1**, *pure mathematics*, Lebanese University Faculty of sciences 2, (Fanar, Lebanon).

Scholarships and Awards

September 2021 **Winner in the challenge Mathematics and Companies organized by AMIES for Ph.D. students for the subject proposed by the company Foyer**, *collaboration with Mariem Abaach and Mehdi Boussâa*, AMIES, (Paris, France).

Subject: How to automatically assess the quality of a dataset?

Company: Foyer  Interview




2019–2020 **Laureate of a Master 2 scholarship for excellent students at the University Paris Cité**, *FSMP*, (Paris, France).



May 2019 **Award for the brilliant students at the Lebanese University**, *AULIB*, (Beirut, Lebanon).

2018–2019 **Laureate of a Master 1 scholarship for excellent students at the Lebanese University**, *AAHF*, (Fanar, Lebanon).

Publications



Paper


Journal paper (Accepted) **D. Hawat**, G. Gautier, R. Bardenet, and R. Lachièze-Rey. On estimating the structure factor of a point process, with applications to hyperuniformity. (Accepted) *Statistics and Computing*, 2022.  arXiv  HAL  Code

Conference paper **D. Hawat**, G. Gautier, R. Bardenet, and R. Lachièze-Rey. Estimation de la fonction de structure d'un processus ponctuel pour l'étude d'hyperuniformité. *XXVIIIème Colloque Francophone de Traitement du Signal et des Images (GRETSI)*, 2022.  GRETSI  HAL












Software/GitHub

structure-factor **Main developer**, Python package for estimating the structure factor and studying the hyperuniformity of point processes, collaboration with Guillaume Gautier, 2021–2022.

 Code  Documentation  Companion paper

assess-data-quality **Co-developer**, Python plug-and-play algorithm for assessing data quality and finding bad data within a dataset. *Project developed during the challenge Mathematics and Companies organized by AMIES*, collaboration with Mariem Abaach and Mehdi Boussâa, 2021.  Code

Presentations and Posters

- Conference **German Probability and statistics days**, *University of Duisburg-Essen*, Essen, Germany, 07-10 March 2023, (planned and confirmed).
- Seminary **Hyperuniform structures, rigid point processes, and related topics**, *Laboratory Paul Painlevé*, Villeneuve-d'Ascq, France, 20-22 February 2023,  Presentation.
- Conference **Computational methods for unifying multiple statistical analyses (Fusion)**, *CIRM*, Marseille, France, 24 October 2022,  Presentation.
- Conference **Lille Days in Point Processes and Stochastic Geometry**, *IMT*, Villeneuve d'Ascq, France, 17-21 October 2022,  Poster.
- Conference **GRETSI**, Nancy, France, 06-09 September 2022,  Poster.
- Seminary **Statistics and probability Ph.D. day**, *Laboratory Paul Painlevé*, Villeneuve d'Ascq, France, 19 May 2022,  Presentation.
- Seminary **Probability seminary**, *MAP5*, Paris, France, 25 March 2022,  Presentation.
- Seminary **New trends in point process theory**, *KIT*, Karlsruhe, Germany, 28 February-02 March 2022,  Presentation.
- Seminary **Team meeting IEMN laboratory**, Villeneuve d'Ascq, France, 29 November 2021,  Presentation.
- Conference **Stochastic Geometry Days**, Dunkerque, France, 15-19 November 2021,  Poster.
- Conference **End-to-End Bayesian learning**, *CIRM*, Marseille, France, 25-29 October 2021,  Poster.
- Conference **From Ph.D. to Ph.D.: A Conference Mapping the Network of Lebanese Mathematics**, (invited) *LAU et UL*, (visio-conference) Beirut, Lebanon, 01 June 2021,  Presentation.

Computer skills

Programming: Python, MATLAB, R, Git, GitHub, Poetry. Documents: \LaTeX , Sphinx, Microsoft Office.

Teaching

- 2020-2021 **Probability (Proba5) -L3 Mathematics and computer sciences**, *University Paris Cité*, with Thierry CABANAL-DUVILLARD, Paris, France. 60h
- 2021 **TP R (sampling random variables) -L3 Mathematics and computer sciences**, *University Paris Cité*, with Thierry CABANAL-DUVILLARD, Paris, France. 12h
- 2021 **Mathematics and calculus (MC2) -L1 Mathematics and computer sciences**, *University Paris Cité*, with Marcela SZOPOS, Paris, France. 30h
- 2020 **Mathematical tools for microeconomics -L1 Economics and Management**, *University Paris Cité*, with Serge SEGOR, Paris, France. 18h

Scientific responsibilities and volunteering

- Since 2021 Member of the working group "Spatial Point Processes", Laboratory Paul Painlevé, Villeneuve-d'Ascq, France.
- 2022 Help with organizing and chairing a session at the conference "Computational methods for unifying multiple statistical analyses (Fusion)", CIRM, Marseille, France.
- 2020/2021 Member of the project BOUM (BOUge tes Mathématiques) organized by Thomas Leblé, MAP5, Paris, France.
- 2020/2021 Organizing working groups for the Ph.D. students in the MAP5 laboratory (with Mariem Abaach), Paris, France.