

Dylan Russon

Ph.D. candidate in Public Health, Inserm U1219 — Bordeaux Population Health

✉ dylan.russon@u-bordeaux.fr

🌐 dylanrusson.fr  dylan-russon

📄 orcid.org/0000-0002-1741-3560  Google Scholar



Research Profile

I model patient flow in emergency departments, so that a reorganisation can be tried before it is applied to patients. My doctoral work builds a discrete-event simulation of a high-volume department, calibrated on four years of individual trajectories, together with the deep learning needed to make those records usable in the first place. Trained as a physicist and a mathematician, I work on real health data and on the question that comes with optimising any flow: who is made to wait.

Education

- 2022–2026  **Ph.D. in Public Health** — Université de Bordeaux, Inserm U1219
Doctoral school *Sociétés, Politique, Santé Publique*; health informatics track
Thesis: *Towards human and digital emergency departments: building a patient flow and process modelling tool for the exploration and validation of innovative initiatives*
Supervisors: E. Lagarde (Inserm U1219) and B. Maury (Université Paris-Saclay)
Defence scheduled 10 November 2026
- 2018–2020  **M.Sc. in Mathematics — PDEs and Probability** — Université de Bordeaux
Stochastic modelling, functional analysis, spectral theory. Awarded with distinction
- 2016–2017  **M2 Theoretical Physics — ICFP** — École normale supérieure, PSL (Ulm)
International Centre for Fundamental Physics, theoretical physics track
- 2014–2017  **Magistère de Physique Fondamentale** — Université Paris-Saclay, Orsay
Three-year selective programme in fundamental physics, taught in English
- 2012–2014  **Classes préparatoires MPSI/MP** — Lycée Clemenceau, Nantes
Two-year intensive programme in mathematics and physics

Research Experience

- 2022–2026  **Doctoral researcher** — Inserm U1219 Bordeaux Population Health, AHead team
Stochastic modelling of patient flow in a high-volume emergency department: discrete-event simulation with finite capacity and blocking, a complementary compartmental description, state-conditional routing learned from data, and counterfactual evaluation of organisational interventions
Four years of individual patient trajectories (225,766 visits, 628,456 inter-area transitions), reconstructed from degraded operational records
- 2021–2022  **Research engineer** — Université de Bordeaux, Inserm U1219
Convolutional and instance-segmentation networks (ConvNeXtV2, ResNet, Mask R-CNN) for automated assessment of pedestrian crossing safety from paired aerial and street-level imagery; computing infrastructure and server administration
- 2020  **Master's research internship** — Institut de Mathématiques de Bordeaux
Fibre bundles and the geometry of visual perception (supervisor: E. Provenzi)
- 2019  **Master's research internship** — Institut de Mathématiques de Bordeaux
Differential operators and spectral analysis (supervisor: L. Michel)
- 2015–2017  **Research internships in physics** — Institut d'Astrophysique de Paris; University of Nottingham; Institut d'Astrophysique Spatiale, Orsay
Gravitational waves; black hole hydrodynamics; synthesis of organic residues

Publications

Peer-Reviewed Journal Articles

- 1 O. Dorémus, **D. Russon**, B. Contrand, A. Guerra-Adames, M. Avalos-Fernandez, C. Gil-Jardiné, and E. Lagarde, "Harnessing Moderate-Sized Language Models for Reliable Patient Data Deidentification in Emergency Department Records: Algorithm Development, Validation, and Implementation Study," *JMIR AI*, vol. 4, e57828, Apr. 2025, ISSN: 2817-1705.  DOI: 10.2196/57828
- 2 **D. Russon**, C. Gil-Jardiné, L. Marcel, L. Chanel, S. Faure, B. Maury, G. Chenais, and E. Lagarde, "Application of Transformer Neural Networks for Data Cleaning in Emergency Room Logs: A Case Study From the Bordeaux University Hospital," *IEEE Journal of Biomedical and Health Informatics*, vol. 29, no. 11, pp. 8484–8496, 2025.  DOI: 10.1109/JBHI.2025.3586325
- 3 **D. Russon**, A. Guennec, J. Naredo-Turrado, B. Xu, C. Boussuge, V. Battaglia, B. Hiron, and E. Lagarde, "Evaluating Pedestrian Crossing Safety: Implementing and Evaluating a Convolutional Neural Network Model Trained on Paired Aerial and Subjective Perspective Images," *Heliyon*, vol. 11, no. 4, e42428, 2025, ISSN: 2405-8440.  DOI: <https://doi.org/10.1016/j.heliyon.2025.e42428>

Conference Proceedings and Posters

- 1 M. Avalos, N. Elorga-Castagnet, **D. Russon**, F. Larrue, and C. Gil-Jardiné, "Serious Games to Address Cognitive Bias and Patient Flow in Emergency Departments," in *The 5th ENLIGHT Teaching & Learning Conference 2025 - Playfulness for the Future of Higher Education*, Conference poster, Uppsala, Sweden, Oct. 2025.  URL: <https://inria.hal.science/hal-05337115>
- 2 L. Rodriguez-Idiazabal, M. Avalos, **D. Russon**, I. Barrio, and J. M. Quintana-López, "Balancing Predictive Performance and Explainability for COVID-19 Data," in *ISI 2025 - 65th ISI World Statistics Congress*, 2025.  URL: <https://inria.hal.science/hal-05385401>
- 3 M. Avalos, D. Cohen, **D. Russon**, M. Davids, O. Doremus, G. Chenais, E. Tellier, C. Gil-Jardiné, and E. Lagarde, "Detecting Human Bias in Emergency Triage Using LLMs: Literature Review, Preliminary Study, and Experimental Plan," in *The International FLAIRS Conference Proceedings*, vol. 37, May 2024.  DOI: 10.32473/flairs.37.1.135586
- 4 A. Guerra-Adames, M. Avalos, D. Cohen, **D. Russon**, M. Davids, O. Doremus, G. Chenais, E. Tellier, C. Gil-Jardiné, and E. Lagarde, "Réflexions pour la conception d'un protocole expérimental de détection des biais dans le triage d'urgence hospitalière à l'aide de modèles de langage," in *EvalLLM2024 - Atelier sur l'évaluation des modèles génératifs (LLM) et challenge d'extraction d'information few-shot*, AMIAD, Toulouse, France, Jul. 2024.  URL: <https://hal.science/hal-04678043>
- 5 **D. Russon**, M. Avalos, A. Guerra-Adames, C. Gil-Jardiné, and E. Lagarde, "AI-Driven Emergency Patient Flow Optimization is Both an Unmissable Opportunity and a Risk of Systematizing Health Disparities," D. Talbert and S. A. Chun, Eds., Poster, The Florida Artificial Intelligence Research Society, vol. 37, LibraryPress@UF, May 2024, p. 4.  DOI: 10.32473/flairs.37

Preprints

- 1 S. Eklöf, E. Lagarde, E. Tellier, **D. Russon**, C. Pradeau, L. Laflamme, and C. Gil-Jardiné, *Health Effects of Wildfires Reported in Emergency Medical Communication Centres: An Ecological Study in Gironde District, France, during the Summer of 2022*, Preprints.org, Preprint, Nov. 2023.  DOI: 10.20944/preprints202311.0133.v1

Invited and Contributed Talks

- 2026  **Modelling patient flow in emergency departments**
Congrès aquitain de médecine d'urgence (CAMU), Bordeaux
- 2025  **Simulating an emergency department to explore its reorganisations**
Public health doctoral network, EHESP
- 2023  **Reconstructing patient pathways from degraded activity data**
Young Researchers' Day, Bordeaux Population Health

Software

- EDSim  **Patient flow simulator for emergency departments**
Modular discrete-event engine separating the simulation core from the configuration of a given department: finite capacities, shift-dependent resources, state-conditional routing, blocking, and a replay mode for counterfactual experiments. Python, SimPy, XGBoost, Optuna
- ResearchOS  **Reproducibility-first research workspace** — tramea.org
Runs captured with full provenance (command, parameters, seed, code version, environment), a lab notebook sealed into a hash chain, and end-to-end encrypted, self-hostable synchronisation. Developed under the French national student-entrepreneur status (Pépité); private beta on Linux, Windows and Android

Teaching and Supervision

- 2024  **Supervision** — Master's project, *Modélisation statistique et stochastique*, Université de Bordeaux
- 2019–2020  **Tutor in mathematics and physics** — Centre pédagogique de Talence
Secondary and undergraduate level

Skills

- Programming  Python, C, C++, R, MATLAB, Mathematica, Bash, $\LaTeX$, Dart/Flutter
- Scientific computing  NumPy, SciPy, pandas, PyTorch, scikit-learn, XGBoost, SimPy, Optuna, Git, Linux
- Modelling  Discrete-event simulation, queueing theory, compartmental models, ordinary and partial differential equations, stochastic processes, time series, optimal transport
- Machine learning  Transformer architectures, fine-tuning of language models, convolutional networks, instance segmentation, gradient boosting, work on degraded and missing data
- Languages  French (native), English (fluent, TOEIC 955), Spanish (basic), Japanese (beginner)

Academic Involvement

- 2024  **Co-organiser** — webinar *L'IA dans le champ du soin : apports et limites*
-  **Contributor** — video contribution for IRCAI (UNESCO)