Orlane Rossini

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Current position

I am currently a PhD fellow in biostatistics at CNRS and an temporary lecturer at Montpellier's Faculty of Science for the Mathematics department. I am actively seeking a postdoctoral position focusing on the development of new machine learning methods for the integration of multi-omics data, with the aim of advancing our understanding of complex biological mechanisms.

Education

PhD in Applied Mathematics with specialisation in Biostatistics   2022 - Expected December 2025
Institut Montpelliérain Alexander Grothendieck (IMAG)   *Montpellier, France*

- **Thesis subject:** Model-based reinforcement learning for the control of partially observable piecewise deterministic semi-Markov decision processes
- **Supervisors:** Benoîte de Saporta, Alice Cleynen and Régis Sabbadin

Master in Data Science & Statistical Modeling   2020 - 2022
University of South Brittany   *Vannes, France*

Bachelor of Science in Computer Science & Mathematics (international course)   2017 - 2019
University of Bordeaux   *Talence, France*

- **Erasmus experience:** Warsaw University of Technology (9 months in Poland)

Academic experience

University of Grenoble, INSERM, IAB   Jan 2022 – Sep 2022
Student Intern - Research engineer   *Grenoble, France*

- **Subject:** Accelerated epigenetic placental aging as a biomarker of pregnancy exposure to ambient air pollution
- **Supervisors:** Johanna Lepeule, Aurélie Nakaruma, Lucile Broséus and François Septier

Regional Health Observatory of French Guiana   Jan 2021 – May 2021
Mentored project - Intern (remotely)   *Cayenne, France*

- **Subject:** Analysis of patient flow in the emergency department and its associated factors in French Guiana between 2018 and 2020
- **Supervisors:** Joseph Rwagitinywa and Evans Gouno
- Extraction and exploitation of data from the French National Health Data System (SNDS).

Publications

Preprint

- *Bayes-Adaptive Impulse Control of Piecewise-Deterministic Markov Processes* in hal-05054392 by O. Rossini, M. Vinyals, A. Cleynen, B. de Saporta, R. Sabbadin, M. Vinyals   May 2025

In Proceedings of Conferences

- *Deep Reinforcement Learning for Controlled Piecewise Deterministic Markov Process in Cancer Treatment Follow-up* in Journée Santé et IA by A. Cleynen, B. de Saporta, O. Rossini, R. Sabbadin, M. Vinyals   July 2024
- *Deep reinforcement learning for controlled piecewise deterministic Markov process in cancer treatment follow-up* in Journées des Statistiques de France by A. Cleynen, B. de Saporta, O. Rossini, R. Sabbadin, M. Vinyals   May 2024
- *An example of medical treatment optimization under model uncertainty* in Journées des Statistiques de France by A. Cleynen, B. de Saporta, O. Rossini, R. Sabbadin.   July 2023

Talks

International conferences

- *Deep Reinforcement Learning for Impulse Control in PDMPs through BAPOMDP framework*, MaSeMo : Markov, Semi-Markov Models and Associated Fields, July 2025
- *An example of medical treatment optimization under model uncertainty*, 21st INFORMS Applied Probability Society Conference, June 2023
- *Maternal exposure to ambient air pollution and placental epigenetic aging: Developing a new clock and estimating associations*, Australian Mathematical Society, December 2022

National conferences

- *Predicting Yeast Translation Efficiency from RNA Modification and Degradation Features: A Machine Learning Approach*, Journées de Biostatistiques, November 2024
- *Deep reinforcement learning for piecewise deterministic Markov process control*, Rencontres Montpellier-Sherbrooke, June 2024
- *Stochastic dynamic control: an approach based on semi-Markov models*, 10èmes Rencontres des Jeunes Statisticien.ne.s, April 2024
- *Stochastic dynamic control: an approach based on semi-Markov models, application to the optimization of a medical treatment*, 8èmes rencontres de Statistique of University of South Brittany, November 2023
- *An example of medical treatment optimization under model uncertainty*, Processus markoviens, semi-markoviens et leurs applications, June 2023
- *Maternal exposure to ambient air pollution and placental epigenetic aging: Developing a new clock and estimating associations*, IMAG PhD student days, February 2023
- *Model-based reinforcement learning for the control of partially observable, piecewise deterministic semi-Markovian decision processes*, INRAE-MIAT PhD student days, January 2023

Supervision

Co-supervision (50% with A. Vernay, PHD fellow IMAG, Montpellier) of a 1st year observation internship Khalil Elhajoui

- **Subject:** Introduction to Supervised Learning and the Use of Perceptrons

Scientific mediation

- Workshop at the *Fête de la Science* "Mathematics with head and hands" (2022)
- Workshop at the *Girls, Math and Computer Science* event (2023)
- Workshop at the *Math en Jeans* conference (2024)

Teachings

Exercises - Scientific Reasoning   2023 - 2025

First-year Bachelor's degree in biology

- Set theory, Random Variables with classical distributions, Conditional Probabilities
- Exam marking

Exercises - Probability & Statistics   2024-2025

First-year Bachelor's degree in computer sciences

- Descriptive statistics, Enumeration and laws of probability, Inferential statistics
- Exam writing and marking

Exercises - Statistical learning & Statistics   2024

Second-year Master's degree in Statistics and Data Science

- Supervised learning, Support vector machines (SVM), Decision trees, Neural networks, Clustering
- Exam marking

Exercises - Linear Alebra   2023

First-year Bachelor's degree in mathematics

- Complex number, Linear system, Linear subspace, Matrices, Linear application
- Exam writing and marking

Administratives

- Elected member of the IMAG laboratory council (from 1st February 2024)
- Member of the sustainable development group at the IMAG laboratory (from January 2024 to January 2025)
- Member of the organising committee of the *Math en Jeans* conference (2024)