Dylan Dronnier

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Experience

Cortaix Labs, Thales, *Applied ressearch scientist* – Palaiseau, France. Sept 2025 – present
Designing machine learning models for improving the analysis of Radio Frequency signal in the context of Electronic Warfare.

Thales Alenia Space, *Applied research scientist* – Cannes, France. Sept 2023 – Aug 2025
- Trained surrogate models for accelerating computationally intensive engineering processes and designed a full-stack web application for serving them.
- Explored innovative approaches for designing vision-based spacecraft guidance, navigation and control systems using reinforcement learning. I supervised two interns from École Polytechnique and a student from ISAE-SUPAERO on this project.
- Applied data fusion techniques for orbit tracking with multiple sources.

Neuchâtel University, *Postdoctoral Researcher* – Neuchâtel, Switzerland. Feb 2022 – July 2023
- Supervised a second-year student from ENS Paris-Saclay during his internship at the mathematical institute on discrete optimization of vaccination strategies.
- Participated in a workshop on reinforcement learning and collaborated with a researcher specialized in this topic.

Münster university, *Research Intern* – Münster, Germany. Jan 2017 – June 2017
- Studied the mathematical properties of the exclusion process.
- Implemented a Monte-Carlo algorithm with variance reduction in order to compute the so-called self-diffusion matrix.

ONERA, *Research Intern* – Châtillon, France. July 2016 – Dec 2016
Worked on discontinuous Galerkin methods with *a posteriori* error estimates to solve hyperbolic equations describing a multiphasic flows.

Education

École des Ponts – Champs-sur-Marne, France. Oct 2018 – Nov 2021
PhD in Applied Mathematics.
- Thesis: Epidemics Models in infinite-dimension and optimal vaccination strategies
- Advisor: Prof. Jean-François Delmas & Prof. Pierre-André Zitt

Sorbonne Université (ex. Université Paris VI) – Paris, France. Sept 2017 – Aug 2018
MSc in Probability theory and Statistics.
With honors.

École des Ponts – Champs-sur-Marne, France. Sept 2014 – Aug 2018
Engineer's degree in Applied Mathematics and Computer Science.
With honors.

Skills

Languages: English, French

Programming: Python, Rust

ML Frameworks: JAX AI Stack (Flax, Optax, Orbax, Grain, ...), Candle, Burn, Pytorch

Infrastructure: Docker, GitLab CI/CD

Research Areas: Neural architecture search, Reinforcement learning, Anomaly detection and localization

Publications

Vaccinating according to the maximal endemic equilibrium achieves herd immunity Mar 2025
Jean-François Delmas, *Dylan Dronnier*, Pierre-André Zitt
10.1137/23M1558112 (SIAM Journal on Applied Mathematics)

The effective reproduction number: Convexity, concavity and invariance Mar 2024
Jean-François Delmas, *Dylan Dronnier*, Pierre-André Zitt
10.4171/JEMS/1431 (Journal of the European Mathematical Society)

Optimal vaccination: various (counter) intuitive examples Feb 2023
Jean-François Delmas, *Dylan Dronnier*, Pierre-André Zitt
10.1007/s00285-022-01858-5 (Journal of Mathematical Biology)

An infinite-dimensional metapopulation SIS model Mar 2022
Jean-François Delmas, *Dylan Dronnier*, Pierre-André Zitt
10.1016/j.jde.2021.12.024 (Journal of Differential Equations)

Adjoint-based adaptive model and discretization for hyperbolic systems with relaxation Jan 2019
Dylan Dronnier, Florent Renac
10.1137/18M120676X (Multiscale Modeling & Simulation)

Selected Honors

- Takeda Poster Award for Mathematical Epidemiology (Society for Mathematical Biology 2021 Annual Meeting).
- PhD thesis prize "Territoires" awarded by *la communauté d'agglomération Paris-Vallée de la Marne*.
- Finalist of the competition *Ma thèse en 180 secondes* (French equivalent of Three Minutes Thesis).