Charlie SIRE — Curriculum Vitae

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Post-doctoral researcher at Mines Paris - PSL

Education

- **Post-doctoral researcher** — **Fontainebleau**
  Geosciences and Geoengineering Department, Geostatistics team, Mines Paris - PSL — *Since 2024*
  Statistical modeling of spatio-temporal data distributed over surfaces

- **Post-doctoral researcher** — **Paris**
  INRIA Saclay Centre, Team ASCII - École Polytechnique, CMAP — *2023-2024*
  Bayesian calibration and uncertainty propagation in different transposition problems

- **Ph.D thesis in Applied Mathematics** — **Paris, Saint-Étienne**
  École des Mines Saint-Étienne - IRSN - BRGM — *2020-2023*
  Quantization methods for the visualization of the flooding risk, defended November 27, 2023

- **Engineering degree** — **Lyon**
  École Centrale Lyon — *2016-2020*
  Master of Mathematics and Risk Engineering

- **Master 1 in Computer Science** — **Wroclaw**
  Wrocław University of Science and Technology — *2018*

Publications

Preprints

- **Bayesian Calibration in a multi-output transposition context.** A joint work with Gilles Defaux, Cédric Durantin, Josselin Garnier, Baptiste Kerleguer et Guillaume Perrin. `https://hal.science/hal-04717715`
- **Augmented quantization: a general approach to mixture models.** A joint work with Didier Rullière, Rodolphe Le Riche, Jérémy Rohmer, Yann Richet, and Lucie Pheulpin. Submitted to Statistics and Computing. `https://hal.science/hal-04209768v1`
- **FunQuant: a R package to perform quantization in the context of rare events and time-consuming simulations.** A joint work with Yann Richet, Rodolphe Le Riche, Didier Rullière, Jérémy Rohmer, and Lucie Pheulpin. Submitted to Journal of Open Source Software. `https://hal.science/hal-04189822`

Accepted for publication

- **Quantizing rare random maps: application to flooding visualization.** A joint work with Rodolphe Le Riche, Didier Rullière, Jérémy Rohmer, Lucie Pheulpin and Yann Richet. Published in Journal of Computation and Graphical Statistics. `https://doi.org/10.1080/10618600.2023.2203764`
- **Improved metamodels for predicting high-dimensional outputs by accounting for the dependence structure of the latent variables: application to marine flooding.** A joint work with Jérémy Rohmer, Sophie Lecacheux, Deborah Idier and Rodrigo Pedreros. Published in Stochastic Environmental Research and Risk Assessment. `https://doi.org/10.1007/s00477-023-02426-z`

Talks in international conferences

- **SIAM UQ24** — **Trieste**
  Augmented quantization: a general approach to mixture models — *February 2024*

- **MASCOT-NUM 2023** — **Le Croisic**
  Augmented quantization: a general approach to mixture models — *April 2023*

- **ECCOMAS 2022** — **Oslo**
  Quantization Applied to the Visualization of Low Probability Flooding Events. — *June 2022*

- **SIAM UQ22** — **Atlanta**
  Quantization Applied to the Visualization of Low Probability Flooding Events — *April 2022*

- **SIAM UQ22** — **Atlanta**
  Robust inversion under uncertainty for flooding risk analysis — *April 2022*

- **UNCECOMP 2021** — **Streamed from Athens**
  Robust inversion under uncertainty for risk analysis with application to the failure of defences against flooding. — *June 2021*

Teaching

- **Lecturer in the Master IMAM** — **Paris**
  Université Paris-Saclay — *Every year*
  Design of experiments — *Since 2023*
  Development of a set of 9 hours of lectures + 3 hours of practical tutorials.

- **Lecturer in the Data Science Major and Master "Maths in Action"** — **Saint-Étienne**
  École des Mines Saint-Étienne — *Every year*
  Design of experiments : Development of a set of 3h of lectures + 3h of practical tutorials — Since 2020
  Markov chain Monte Carlo: Development of a set of 1.5h of lectures
  Kriging, Global optimization: $\sim$ 8h of practical tutorials

Internships

- **Internship in Applied Mathematics** — **Dardilly**
  The Manitowoc Company — *2019-2020*
  Implementation of Machine Learning strategies for crane failure prediction

- **Data scientist intern** — **Singapore**
  Circles.life — *2019*
  Machine learning approaches to enhance marketing strategies

Skills

- **Programming languages**
  Python: Everyday use with libraries NumPy, Pandas, PyMC, openturns, pylibkriging
  R: Everyday use, development of the package FunQuant

- **Expertise**
  Kriging, Importance Sampling, Clustering, Gaussian Processes, Bayesian Calibration, Global Optimization methods, Stepwise Uncertainty Reduction, Design of Experiments