CharlieSIRE | 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

Published articles

- Sire, C., Garnier, J., Kerleguer, B., Durantin, C., Defaux, G., & Perrin, G. (2025). **Bayesian Calibration for Prediction in a multi-output transposition context**. *International Journal for Uncertainty Quantification, 15(6)*. https://doi.org/10.1615/Int.J.UncertaintyQuantification.2025056586

- Sire, C., Le Riche, R., Rullière, D., Rohmer, J., Pheulpin, L., & Richet, Y. (2023). **Quantizing Rare Random Maps: Application to Flooding Visualization.** *Journal of Computational and Graphical Statistics, 32(4), 1556–1571.* https://doi.org/10.1080/10618600.2023.2203764

- Rohmer, J., Sire, C., Lecacheux, S., Idier, D., & Pedreros, R. (2023). **Improved metamodels for predicting high-dimensional outputs by accounting for the dependence structure of the latent variables: application to marine flooding.** *Stochastic Environmental Research and Risk Assessment, 37(8), 2919-2941.* https://doi.org/10.1007/s00477-023-02426-z

Preprints

- Sire, C., Pereira, M., & Romary, T. (2025). **Spline Interpolation on Compact Riemannian Manifolds.** https://hal.science/hal-05313523

- Sire, C., Rullière, D., Riche, R. L., Rohmer, J., Richet, Y., & Pheulpin, L. (2025). **Augmented Quantization: Mixture Models for Risk-Oriented Sensitivity Analysis.** https://hal.science/hal-04209768

- Sire, C., Richet, Y., Riche, R. L., Rullière, D., Rohmer, J., & Pheulpin, L. (2023). **FunQuant: AR package to perform quantization in the context of rare events and time-consuming simulations.** https://hal.science/hal-04189822

Talks in international conferences

- **GEOSTATISTICS DAYS 2025** — **Fontainebleau**
  Spline Interpolation on Riemaniann Manifolds — *September 2025*

- **DTE & AICOMAS 2025** — **Paris**
  Bayesian Calibration for Prediction in a Multi-Output Transposition Context — *February 2025*

- **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 Geostatistics module** — **Paris**
  Polytech Sorbonne University — *2025-2026*
  Geostatistics
  Development of a set of 10h of lectures

- **Teaching Assistant for the Probability course** — **Paris**
  Mines Paris - PSL — *Since 2024*
  Probability
  10 hours of practical tutorials.

- **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 — *2020-2024*
  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, Design of Experiments, Spatio-temporal model, SPDE