Xavier Loizeau | Higher research scientist

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Professional experiences

NPL (National Physical Laboratory) **Teddington, England**
Higher Research Scientist 21^{st} of January 2019 – present
Contributing to scientific projects by developing mathematical models, and statistical estimators, identifying appropriate statistical methods, implementing software solutions, and deriving mathematically founded, data-driven conclusions. Contributing to software quality procedures by developing repository templates and scripts. Mentoring PhD students. Organising a problem-sharing regular meeting for the Data Science department where members can present scientific challenges they are facing and get support in an informal manner. Contributing to the writing of grant proposals and developing new projects by supporting other departments. Contributing to company-wide policies as a member of the LGBTQ+ committee. Providing to recruitment as a member of the recruitment assessor pool.

Ruprecht-Karls-Universität, Institute of applied mathematics, **Heidelberg, Germany**
Philosophiæ doctor (PhD) student in Mathematic 2015–2018
Hierarchical Bayes and frequentist aggregation in inverse problems: proved oracle and minimax optimal contraction rates for posterior distribution from hierarchical sieve priors, and oracle and minimax optimal convergence rate for aggregated projection estimators in the context of statistical linear inverse problems where the operator is unknown;

ONERA (National Agency of Study and Research in Aerospace) **Palaiseau, France**
Internship 2015
Building a multi-fidelity surrogate model for Infra-Red emission by space-rocket engines.

CREST (Research Center for Economics and Statistics) **Rennes, France**
Internship 2014
Studied, implemented and compared two methods for illumination bias removal on electronic microscope images.

Current topics of research.....

Applications: Satellite imaging, satellite altimetry, histo-pathology, medical imaging, sensor design, mass spectrometry imaging.
Mathematics: statistical ill-posed inverse problems, Bayesian and frequentist methods for non parametric models, minimax theory, point processes, functional analysis, probability theory, approximation algorithms, survival analysis, Hidden Markov Models, Kalman and particle filters, stochastic processes;
Data science: image processing, uncertainty quantification in sparse model estimation (LASSO, conformal estimation, perturbation methods), Optimal Transport based methods (morphometry, distribution free testing), functional data analysis, MCMC methods, network analysis, surrogate models, design of experiments.

Education

ENSAI - National School for Statistics and Information Analysis — **Rennes, France**
MSc in Advanced Statistical Engineering; 2012–2015

University of Rennes 1, department of mathematics — **Rennes, France**
MSc in Mathematical Statistics; 2015

University of Rennes 1, department of mathematics — **Rennes, France**
BSc in Mathematics; 2012

Lycée Clemenceau — **Nantes, France**
Post secondary classes préparatoires Specialisation in Mathematic and Physics 2010–2012
undergraduate-level courses required in preparation for competitive entrance exams into top graduate and engineering schools (France's grandes écoles).

Subjects in study program

MATHEMATICS: probability theory, complex analysis, topology, functional analysis, measure theory, numerical analysis, group theory, arithmetic, linear algebra;
STOCHASTIC: survival analysis, Le Cam theory, test theory, generalized additive models, non linear regression, time series;
DATA SCIENCE: neural networks, SVM, random forests, classification/regression trees, CART, BAGGING, MSMS algorithms, image processing (filtering, Markov fields, MAP classification, MAP reconstruction), kNN, surrogate models, design of experiments, quality control of industrial processes.

Online lectures (certificates available on request)

Unreal engine and C++ (currently following), Initiation à la théorie des distributions (Coursera, École Polytechnique), Approximation Algorithms Part I (Coursera, École Normale Supérieure), Introduction to Complex Analysis (Coursera, Wesleyan University)

Programing languages

Python (wrote several packages for analysis of data - MSI, satellite imaging, altimetry data, high resolution microscopy, ...), **R** (many projects during studies, intensive use during internships for simulations and real data applications, data simulations during my PhD, and since joining NPL), **C++** (using for video game development with Unreal Engine), **Matlab** (used in research context, during studies for image treatment projects).

Languages

French (native), English (fluent), German (basic), Spanish (basic).

Interests

Music (Guitar, singing, composition), **dancing** (pole and ballet, performing), **sport** (sport climbing, bouldering, cycling), **reading** (fictions, popular science, philosophy, sociology, technological surveillance), **traveling**.