Pierre Bertrand

PhD in Statistics, Data Scientist at BNPP CIB

Professional Experience

Apr. 2023 – Today	**Product Owner at BNP Paribas CIB**, *Analytics Consulting*, Internal consulting team in Artificial Intelligence (AI) & Business Intelligence(BI) ESG API which provides ESG Data from 20 external providers to the whole BNPP: collect and prioritize users's requests from all over the group ● design technical solution to maintain and improve the API leveraging on several developers. GHG API which spreads the BNPP reference on Green House Gas Emissions for each company based on external providers and an internal Carbon Footprint Model (CFM): develop methods to validate the internal CFM and improve its robustness
Jan. 2018 – Apr. 2023	**Data Scientist at BNP Paribas CIB**, *Analytics Consulting* AI: Speech-to-text solution ● Search solution on multiple datasources used within all BNPP ● Translate solution used within all BNPP ● Clustering of employees / roles ● Sentiment analysis. BI: Matching between current workforce and future roles ● Monitoring of buildings occupation for IMEX France. Other: Fuzzy matching in Pyspark to complete an internal client database using Orbis ● Automatic generation of job offers used by all managers within BNPP.
Sept.2015 – Déc. 2017	**Data Scientist at Thales**, *AI Lab, Technical direction of Thales Communications and Security*, Research team Recurrent neural network developed in Scala/Spark to predict failures in an industrial system ● Siamese neural network to speed up fingerprint identification ● Convolutional neural network to identify voice in radio communications ● Patents on those solutions (see below) ● Thales point of contact for European project TENSOR.
2017 – Today	**Data Science Professor at l'Institut des Actuaires** Introduction to Machine Learning ● Introduction to Deep Learning ● Introduction and application of Transformer ● Machine Learning practical exercises: Textmining - Sentiment analysis - Image generation and classification.

Education

PhD 2017–2021 in parallel of the full-time employment

Monge's Conditions, Optimal Transport and Mathematical Relational Analysis : properties, applications and extension of the indeterminacy coupling. Under supervision of Michel Broniatowski and Jean-François Marcotorchino, in department LPSM of Sorbonne Universités. *Study of a poorly known coupling function called indeterminacy. Main results: application to the so-called spy problem & to task partitioning - extension in continuous case and analysis of the attached copula - discovery of a property of couple matching minimization - interpretation through a new decomposition ● One paper accepted, one conference, two other papers currently in review (see below).*

ENS Cachan & Mines de Paris 2011–2015

2011–2015	**École normale supérieure de Cachan**, *Normalien* Normalien is a temporary civil servant status obtained after a higly competitive examination. Students are paid to study a specific field, here mathematics. They are trained by and for research.
2014–2015	**Université d'Orsay**, *Ms in Probablity and Statistics*, *Highest distinction*
2013–2014	**Mines de Paris**, *'Diplôme d'ingénieur': MENG in civil engineering*, *Highest distinction* L'École des Mines is one of the best engineering French school.

12 rue Pouchet – 75017 Paris

☐ *06.70.93.35.84*

✉ *pierre.bertrand@ens-paris-saclay.fr or pierre.bertrand.2011@mines-paris.org*

2011–2013	**École normale supérieure de Cachan**, *Ms of Mathematics*, *Highest distinction*
2011–2013	**École normale supérieure de Cachan**, *Ms of Computer Science*, *Highest distinction*
2009–2011	**Lycée Thiers**, *CPGE MPSI/MP**

An intensive curriculum in mathematics, physics, computing for competitive entry into French engineering schools. Admitted to École normale supérieure de Cachan as a normalien, on competitive examination, rank: 108/5000+.

Internships

2014 **Banque de France**, *7 months*, Credit risk service
Stress test solution • Optimization of allocation on several currencies bonds • Comparison of Bloomberg gouvernmment indices with internal ones.

2013 **CSAIL (MIT computer science laboratory)**, *3 months*
Balls-into-bins problem: control of existing algorithms run - invention of algorithms with priority - one conference and one paper (see below).

2012 **CMLA (ENS Cachan mathematical laboratory)**, *6 mois*
Convergence of finite volume schema: proof of convergence in case of a triangle discretisation - exhibition of a counter-example convergence in dimension 3 - generalization of a published result in Springer, 2011.

Publications

Ongoing Bertrand P., Broniatowski M., and Stummer W.: Bare simulation to compress neural nettworks

Submitted (Submitted in February 2022, Journal of Machine Learning Research) Bertrand P., Broniatowski M., and Marcotorchino J.F.: A constructive method to minimize couple matchings, *preprint hal-03086553* (2022) • (Submitted in May 2021, journal JMVA) Bertrand P., Broniatowski M., and Marcotorchino J.F. : Continuous indetermination and average likelihood minimization, preprint hal-03215096 (2021)

Published
- Bertrand P., Broniatowski M. and Marcotorchino J.F.: Independence versus Indetermination: basis of two canonical clustering criteria, *Advances in Data Analysis and Classification* (2022)
- Bertrand P., Broniatowski M. and Marcotorchino J.F.: Minimization with respect to divergences and applications, *Geometric Science of Information* (2021)
- Delavallade T., Bertrand P. and Thouvenot V. : Extracting future crime indicators from Social Media, *Factors Driving Future Crime, Springer* (2016)
- Bertrand P. and Mabiala Y. : Deep Recurrent Neural Network for Sequence Learning in Spark, *Spark Summit East* (2016)
- Bertrand P. and Lenzen C. : The 1-2-3-Toolkit for Building Your Own Balls-into-Bins Algorithm, *Algorithm Engineering & Experiments (ALENEX)* p.44-54 (2015)
- Bertrand P. and Lenzen C. : Brief Announcement: The 1-2-3 Toolkit for Building your own Balls-into-Bins Algorithm, *28th Symposium on Distributed Computing (DISC)* (2014)

Patents Speed up of fingerprints indentification using deep learning • Sytem of industrial factory monitoring ; attached processes for failure identification.

Others

Licenses Car, Motorbike, Boat