Paul Dufossé – Curriculum Vitae

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Alternative versions of my resume are available on LinkedIn and my website, and publications are listed on
Google Scholar (almost complete) or my website (including oral communications).

Who I am

After a M.Sc. degree in machine learning (ML) and a Ph.D. degree in randomized optimization techniques applied to Radar antenna signal processing, I transitioned to the healthcare industry, and I am now working on immuno-oncology studies, applying biostatistics and ML techniques to clinical and genomic data. Technical topics I am currently working on include: multivariate statistics, feature selection, deep learning for survival analysis and generative models for data augmentation.

What I'm looking for

I want to apply my skills in a great team working on a cutting-edge technology in the healthcare industry, ideally in immuno-oncology. I am looking for a position of data scientist / biostatistician or machine learning researcher, starting in January or February 2024, and (selectively) open to relocation.

Education

2018-2022   Ph.D. in Applied mathematics & computer science - Institut Polytechnique de Paris, France

French industrial research contract (CIFRE)
Thesis title: *Algorithms for non-linear constrained continuous optimization:*
a comparison between gradient-based methods and evolution strategies,
and applications to radar antenna design.

2012-2017   M.Sc. in Mathematics, Learning and Human Sciences - Paris-Dauphine University, France

Applied mathematics, specialization in statistics and machine learning

2011-2012   Preparatory school (Math-Physics) - Collège Stanislas, Paris, France

One year of training to prepare for the competitive entrance exams to the French
Grandes Écoles, but I rather went to University.

Work experience

Dec 2022 -   COMPO Inria & Inserm team, Faculté de Pharmacie, Marseille, France
Present   *Post-doctoral researcher*

I am currently doing predictive modeling on clinical data from the French PIONeeR study against lung cancer. We want to identify patients who will benefit from immunotherapy, and to understand the mechanisms of resistance to immunotherapy in patients with advanced (metastatic) lung cancer. To achieve this, we are using several techniques, from (bio)statistics and survival analysis to supervised and unsupervised machine learning and deep learning.
The study is ongoing. **I managed two research interns – who produced research papers – and one engineer within the project.** Preliminary results were already communicated to major conferences in the field of immuno-oncology, and journal articles are currently under review.

May 2022 -	COMPO Inria & Inserm team, Faculté de Pharmacie, Marseille, France
Dec 2022	*Research engineer*

I served as software engineer for the team, improving code quality and raising standards, implementing CI/CD pipelines, tests, and a private website to easily share results among partners.

Oct 2018 -	Inria & Thales DMS, Paris area, France
Dec 2022	*Research engineer & Ph.D. candidate*

The goal of my PhD was to develop fast and robust optimization algorithms to solve antenna design problems in Radar systems. I worked on several problems related to pulse compression (time filtering) and beamforming (spatial filtering) of radar antennas and signal. **I managed one research intern during my PhD, who delivered applicable results for the company.**

Apr 2017 -	MFG Labs, Paris, France
Aug 2018	*Data scientist*

I made my end-of-studies internship where I applied classification and clustering techniques for display and video web advertising. Then worked as a full-time data scientist in the company. Projects include computational advertising in real time, global optimization for a car renting business model and multi-labels predictive scoring for customer relationship management (CRM).

Engineering Skills

I am fluent writing code in both Python 3 and R, and **I strive to apply production-level software development standards**. Below is a list of software / libraries I have had experience with.

Scripting languages	Python 3, R
Low-level languages	only a bit of C
Scientific programming	scipy, numpy
Statistics	scipy.stats, statsmodels
Data science	pandas, R tidyverse, SQL
Machine learning	scikit-learn, glmnet
Deep learning	PyTorch, Synthetic Data Vault
Optimization	scipy.optimize, cma, pdfo
Survival analysis	lifelines, scikit-survival, pycox
Data visualization	matplotlib, seaborn, plotly, ggplot
and dashboarding	Shiny, Tableau
Containerization	Docker
Processing pipelines	GitLab CI, AirFlow
Continuous Integration	GitLab CI & GitLab Pages
Version control	bash, git, git-lfs
Project Management	GitLab Agile Project Management, Jira, Confluence

Research work

My line of research is to combine inferential statistics, (all kinds of) optimization techniques, and machine learning to solve common applications from the biomedical field. Prior to this, I pursued my Ph.D. in applied mathematics and computer science, working on optimization techniques for radar antenna design. I focused on evolution strategies, a class of randomized, derivative-free optimization algorithms, and studied their application to problems with constraints.

I am particularly interested in benchmarking existing algorithms on difficult situations matching real-world problems, where an exhaustive theory is often unavailable. I find it very important to understand the limitations of each algorithm, and to be able to choose the right one for the right problem. Because this is a similar concern in industry, this is my motivation to transition to a private company.

Interests

- **Outdoor : Climbing, Hiking, Running, Cycling, Surfing**
- **Playing Touch Rugby**
- **Cooking**
- **Music**
- **Home Design**

Referees

Name	Cyrille Enderli	**Name**	Sébastien Benzekry
Company	Thales Defense Mission Systems	**Company**	Inria Sophia-Antipolis
Position	Research engineer & IA lab manager	**Position**	COMPO team leader
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Name	Nikolaus Hansen
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