Alex Pierron

+33 625 15 12 60 | alex.pierron@protonmail.com | Saint-Cloud, France
https://alex-pierron.github.io/ | Alex Pierron | alex-pierron

Experience

IP Paris, SAMOVAR Laboratory: AI researcher, PhD student
Palaiseau, France
Oct. 2024 to Sept. 2027
3 years

- **PhD topic**: Cybersecurity impact of AI Optimization in B5G networks.
- **Keywords**: Artificial Intelligence, Single & Multi-Agent Reinforcement Learning, B5G networks, Cybersecurity
- **Main tasks**: The primary goal of this PhD is to investigate how Artificial Intelligence techniques, particularly Reinforcement Learning, can be exploited to develop new attack methods targeting 5G and 6G network components. The research aims to demonstrate the feasibility of direct attacks on AI models and propose innovative methods to mitigate the identified risks.
- **Working conditions**: Comprehensive scientific approach in an research environment. This PhD is part of the PEPR Future Networks, the French national research plan to conduct research on B5G and 6G networks.

Dassault Aviation: AI Researcher in Reinforcement Learning, Intern
Saint-Cloud, France
Apr 2024 to Sept. 2024
6 months

- **Internship topic**: AI for collaborative air combat: Multi-Agent Reinforcement Learning (MARL).
- **Keywords**: Applied and Fundamental Mathematics, Deep Learning, Multi-Agent Reinforcement Learning, Python, PyTorch, Industrial Research.
- **Main tasks**: Bibliographical study of the subject (RL + MARL) and resources available in open source. Complementary mathematical research to deepen certain aspects. Development of realistic environments (Python,C++) and tactical proposals given by AI for different scenarios.
- **Working conditions**: Comprehensive scientific approach in an industrial research environment.

CNRS, Signals and Systems Laboratory: AI Researcher in Computer Vision, Intern
Gif-Sur-Yvette, France
Mar. 2023 to Jul. 2023
5 months

- **Internship topic**: How to classify small databases using the knowledge of larger ones by Few shot learning.
- **Keywords**: Mathematics (Statistics, Probability, Optimization), Artificial Intelligence, Deep Learning, Few Shot Learning, Image Processing, Research.
- **Main tasks**: Bibliography on few shot learning methods.Implementation of the selected approaches in Python with pytorch.Tests and validation with texture databases. Comparison with other methods. Interpretation and analysis of the results and proposals for future relevant areas of research.
- **Working conditions**: Comprehensive scientific approach in a research environment.

CNRS, IJCLab: Research Assistant, Intern
Orsay, France
October 2020 to Jan. 2021
3 months

- **Description**: part-time internship at the ThomX particle accelerator demonstrator. understanding of the methodology and constraints of the project. Camera calibration via image recognition and processing to allow optimal operating of the measurement instruments.

Core Competencies

- Statistics, Optimization, Probability.
- Machine Learning, Deep Learning, Computer Vision, Online Learning & Reinforcement Learning.
- Understanding, modeling and solving mathematical problems.
- Understand, use and clearly explain mathematical theory and results from scientific articles.
- Use and develop numerical tools to illustrate the concepts with pratical applications.
- Collaborate in a research environment.
- Rigor, scientific curiosity, agility of mind, interdisciplinarity.

Practical skills & Technologies

Languages:

- **English: fluent** *Cambridge English Certificate : L&R General English - C1+, ID: KZW58-VFJCS*
- **French: mother tongue**

Informatic Capacities:

- development and data analysis with **Python: Numpy, Scikit-Learn, Pytorch & Cuda, Jax.**
- development and data analysis with **R** and notions about **C++**.
- Utilization of **Git** for organizing collaborative work, **Slurm** for running programs on supercomputers, and **multi-processing** to optimize computation performance during parallel computing.
- **LaTeX** for redaction of scientific papers and technical documentation.

Software: Windows and Linux, Visual Studio, R Studio, Anaconda, Docker, Github, Zotero

Education

MS **Paris-Saclay University**, Mathematics and Artificial Intelligence (Master website): Sept. 2022 to Sept. 2024

- **Organization:** Master directed by the **University Mathematics Department** and shared with **CentraleSupélec.** 2nd year courses shared with the MVA master's program at **ENS Paris-Saclay** and the StatML master's program at Ecole Polytechnique.
- **2nd year coursework:** *Advanced Supervised Methods, Advanced Unsupervised Methods, Object Recognition and Computer Vision, Statistics in Large Dimensions, Theoretical Foundations of Deep Learning, Theory and Applications in Reinforcement Learning, Guidelines in Statistical Learning, Graphical Models: Discrete Inference and Learning, Online Learning: link with Optimization and Games.*
- **1rst year coursework:** *Statistics & Decision Theory, Optimization, Advanced Probabilities, Distributed Systems and Calculation, Data Analysis, Machine Learning Methods, Statistical Learning, Sequential Learning*

BS **Paris-Saclay University**, Double Bachelor in Mathematics and fundamental Physics: Sept. 2019 to Aug. 2022

- **Organization: Selective and intensive double bachelor's degree in mathematics and physics** directed by the university Mathematics and Physics Departments. Final year of physics shared with **ENS Paris-Saclay** and the fundamental physics "magistère" program at **Paris-Saclay University**.
- Last year physics coursework: *Electromagnetism, Analytical Mechanics, Quantum Mechanics, Fluid Mechanics, Linear and Non-Linear Optics, Statistical Physics, Numerical Methods*
- last year mathematics coursework: *Probability, Integration, Differential Calculus, Partial Differential Equations, Ordinary Differential Equations, Algebra, Signal Processing, Numerical Methods.*