Alex Pierron

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Saint-Cloud, France

• https://alex-pierron.github.io/

in Alex Pierron

alex-pierron

Experience _

IP Paris ☑, SAMOVAR Laboratory ☑: Al researcher, PhD student

• PhD topic: Cybersecurity impact of AI Optimization in B5G networks.

Oct. 2024 to Sept. 2027 3 years

Palaiseau, France

Saint-Cloud, France Apr 2024 to Sept. 2024

Gif-Sur-Yvette, France Mar. 2023 to Jul. 2023

5 months

6 months

- **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 ☑: Al Researcher in Reinforcement Learning, Intern

- Internship topic: Al 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 <a>☑: Al Researcher in Computer Vision, Intern

- 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

• **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.

Orsay, France October 2020 to Jan. 2021 3 months



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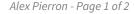
PROGRAMME DE RECHERCHE











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 multiprocessing 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.



• 1^{rst} 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.*