RonanFruit

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languages

French: mother tongue
English: high proficiency
Italian: basic command

programming

Python, Scikit-learn, Matplotlib, Tensorflow, PyTorch
Scala, Spark, Hadoop
Linux, Bash, LXD, Docker
Git
LaTeX

Research Experience

Jan–Apr. 2019 **Facebook AI Research** Montreal, Canada

Research Intern
Topic: Off-policy Policy Gradient Algorithms for (more) sample efficient Reinforcment Learning.
Before defending my PhD, I joined Facebook AI Research in Montreal for a 4-month research internship with Joelle PINEAU. I worked on off-policy methods for policy gradient algorithms like Actor-Critic. My goal was to improve the sample complexity of such algorithms using importance sampling. The algorithms were implemented in PyTorch.

2015–2018 **INRIA LILLE - NORD EUROPE, SEQUEL team** Lille, France

PhD Student
Research Topic: Statistical analysis of the exploration–exploitation dilemma in Reinforcement Learning under various forms of prior knowledge
Advisors: Alessandro LAZARIC, Daniil RYABKO
My research was focused on designing Reinforcement Learning algorithms with provable good performance. Reinforcement Learning is an area of Machine Learning concerned with sequential decision making in an unknown environment. I was particularly interested in the exploration-exploitation trade-off in on-line Reinforcement Learning (from a theoretical perspective). During my PhD I have published 5+ research papers in top Machine Learning conferences like NeurIPS and ICML. I have also co-organized a workshop on Reinforcement Learning (EWRL 2016) and I gave a tutorial at a conference (ALT 2019).

Feb.-Jun. 2014 **Cranfield University** Cranfield, United Kingdom

Research Intern
Research Topic: Combination of Bayesian Filtering and Inference Techniques to improve the tracking of air threats and the analysis of their behavior
Advisor: Hyo-sang SHIN
Full-time 5-month Research Study. Tools studied: Truncated & Square-Root Unscented Kalman Filters, Interacting Multiple Models, Statistical Hypothesis Tests.

Work Experience

2019–Now **Vekia** Lille, France

Data Scientist
Vekia is a start-up applying AI algorithms to overcome various challenges arising in Supply Chain. My role at Vekia is to design, implement and evaluate such algorithms. I am mostly (but not exclusively) working on time series forecasting problems as well as inventory problems. I use Apache Spark for data manipulation at scale, and Pyhon librairies like Scikit-Learn, XGBoost or Tensorflow to implement and train Machine Learning algorithms. I am always trying to challenge existing approaches and investigate creative and innovative solutions to long-standing problems e.g., forecast-free replenishment, active learning to address cold start issues.

2013–2015 **MBDA (Airbus Group)** Paris, France

Apprentice R&D Engineer
Mission: Design of real-time Prediction & Decision Aid Algorithms for Command and Control Systems
I worked in several R&D teams in parallel of my studies (1-2 days per week, full time during all academic holidays and for my Master Thesis -8 months-). My mission was to design and implement new algorithms able to accurately predict the future behaviour of air threats in order to improve the performances of ground-based air defense systems. To address this problem, I used game-theoretic and Bayesian inference techniques. The work carried out has been patented in France.
Topics studied: Guidance, Navigation & Control, Game Theory, 2-Player Extensive-Form Bayesian Games, Nash-Equilibria Refinements (Sequential, Quasi-perfect, Proper), Linear Complementarity Programming, Entropy maximization.

Education

Aug. 2017 — **Data Science Summer School (DS3 2017)** — École Polytechnique Paris Tech

Jun. 2017 — **Machine Learning Summer School (MLSS 2017)** — Max Planck Institute for Intelligent Systems

2014–2015 — **M.Sc.** in Applied Mathematics [GPA: 4.12] — CentraleSupélec
(Emphasis in Machine Learning)
CentraleSupélec is one of France's leading engineering schools (ranked 2nd)
Thesis: "Design of real-time Prediction & Decision Aid Algorithms for Command and Control Systems" | Advisors: David VIGOUROUX (Airbus Group), Assoc. Prof. Iasonas KOKKINOS (CentraleSupélec)

2012–2014 — **B.Sc.** in Engineering [GPA: 4.08] — CentraleSupélec
(Emphasis in Mathematics)

Publications & patents (sample)

2018 — **Near Optimal Exploration-Exploitation in Non-Communicating MDPs** — NeurIPS 2018
Ronan Fruit, Matteo Pirotta, Alessandro Lazaric
Spotlight Presentation (top 16% of accepted papers)

2018 — **Efficient Bias-Span-Constrained Exploration-Exploitation in RL** — ICML 2018
Ronan Fruit, Matteo Pirotta, Alessandro Lazaric, Ronald Ortner
Spotlight Presentation (top 50% of accepted papers)

2017 — **Regret Minimization in MDPs with Options without Prior Knowledge** — NIPS 2017
Ronan Fruit, Matteo Pirotta, Alessandro Lazaric, Emma Brunskill
Spotlight Presentation (top 17% of accepted papers)

2017 — **Procédé et dispositif de prédiction de solutions d'attaque et de défense optimales dans un scénario de conflit militaire [Patent FR 1700216]** — INIP
Ronan Fruit, David Vigouroux, Stéphane Le Ménec, Charlotte Touchard, Alexandre Kotenkoff, Mathias Formoso

Awards

2015 — **Best Student Award** — CentraleSupélec
Best academic results among all engineering students who graduated from CentraleSupélec in 2015 and spent three years at the school

Interests

Driven by an ever-alert curiosity, and fed by regular scientific readings (Physics, Mathematics, Logic, Epistemology and of course AI are my favourite topics) as well as self-training (I follow MOOCs on plateforms such as Coursera, edX and OpenClassroom), I like to leverage new findings and discoveries to spark new projects. On my free time for instance, I help my wife (who teaches French literature in high schools and at the university) build innovative educational content. I am the administrator of the following websites:

- elen.krounix.org: a literature blog and platform where Master students can create and publish digital content (essays, podcasts, videos, ...).
- mooc.krounix.org: a MOOC platform for high school students powered by OpenedX (the open source software that powers edX).
- classe.krounix.org: a virtual classroom platform born during the Covid crisis and powered by BigBlueButton (an open source software used by several universities).

During my PhD, and later on while working on the above projects, I developed a real passion for Open Source softwares. In the future I would like to contribute to the development of Open Source projects.