

Ronan Fruit

PHD STUDENT IN REINFORCEMENT LEARNING

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Education

CentraleSupélec

M.Sc. IN APPLIED MATHEMATICS (EMPHASIS IN MACHINE LEARNING)

Paris, France

Sept. 2014 - Oct. 2015

- 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)
- GPA: 4.12/4.33

CentraleSupélec

B.Sc. IN ENGINEERING (EMPHASIS IN MATHEMATICS)

Paris, France

Sept. 2012 - Aug. 2014

- GPA: 4.08/4.33

SUMMER SCHOOLS

Data Science Summer School (DS3 2017)

ÉCOLE POLYTECHNIQUE PARIS TECH

Paris, France

Aug. 2017

- **Topic:** Foundations of Machine Learning (ds3-datascience-polytechnique.fr)

Machine Learning Summer School (MLSS 2017)

MAX PLANCK INSTITUTE FOR INTELLIGENT SYSTEMS

Tübingen, Germany

Jun. 2017

- **Topic:** Foundations of Machine Learning (mlss.tuebingen.mpg.de)

Research Experience

Inria Lille - Nord Europe

PHD STUDENT IN REINFORCEMENT LEARNING

Lille, France

Dec. 2015 - Present

- Inria is a French Research Institute for Computer Science and Applied Mathematics
- **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 interests lie in designing and analysing *On-line* Reinforcement Learning algorithms with *provably* good performance (measured in terms of *sample complexity* or *regret*). In the first half of my PhD, I focused on the theoretical understanding of some hierarchical RL methods (named "options"). More recently I have been investigating *theoretical open questions* in the On-line RL literature including: *tightness* of existing regret bound in RL (in particular the role of the *diameter* of an MDP) and learning in *non-communicating* MDPs (i.e., when the diameter is infinite).

Cranfield University

RESEARCH INTERN

Cranfield, United Kingdom

Feb. 2014 - Jun. 2014

- **Research Topic:** Design of new real-time Inference & Pattern Recognition Algorithms for Command and Control Systems
- **Advisor:** Hyo-sang SHIN
- Full-time 5-month Research Study.
- **Work carried out:** combination of Bayesian Filtering and Inference Techniques to improve the tracking of air threats and the analysis of their behavior.
- **Key words:** Truncated & Square-Root Unscented Kalman Filters, Interacting Multiple Models, Statistical Hypothesis Tests (Wald, Chow).

Work Experience

Facebook Artificial Intelligence Research (FAIR)

RESEARCH INTERN

Montreal, Canada

Jan. 2019 - Apr. 2019

- **Research Topic:** Off-Policy Policy Gradient methods for (more) sample efficient Reinforcement Learning
- **Advisor:** Joelle PINEAU
- **Key words:** Deep Reinforcement Learning, Policy Gradient, Off-Policy Actor Critic.

Airbus Group

APPRENTICE R&D ENGINEER

Paris, France

Jan. 2013 - Oct. 2015

- Worked in several R&D teams in parallel of my studies (1-2 days/week, full time during all academic holidays and for my Master Thesis -8 months-)
- **Mission:** Design of real-time Prediction & Decision Aid Algorithms for Command and Control Systems
- **Key words:** Guidance, Navigation & Control, Multi-agent systems, Game Theory, Linear Complementarity Programming, Entropy maximization.

Honors & Awards

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

Paris, Lille

Publications

UNDER REVIEW

Exploration Bonus for Regret Minimization in Undiscounted Discrete and Continuous Markov Decision Processes

Jian Qian, *Ronan Fruit*, Matteo Pirotta, Alessandro Lazaric

PDF

2018

Near Optimal Exploration-Exploitation in Non-Communicating Markov Decision Processes

Ronan Fruit, Matteo Pirotta, Alessandro Lazaric

NeurIPS 2018

PDF

Efficient Bias-Span-Constrained Exploration-Exploitation in Reinforcement Learning

Ronan Fruit, Matteo Pirotta, Alessandro Lazaric, Ronald Ortner

ICML 2018

PDF

2017

Regret Minimization in MDPs with Options without Prior Knowledge

Ronan Fruit, Matteo Pirotta, Alessandro Lazaric, Emma Brunskill

NIPS 2017

PDF

Exploration-Exploitation in MDPs with Options

Ronan Fruit, Alessandro Lazaric

AISTATS 2017

PDF

Visits and Talks

ALT 2019

- [Tutorial](#) on the exploration-exploitation dilemma in Reinforcement Learning.

Chicago, USA

March 2019

NeurIPS 2018

- Poster & Spotlight presentation (Top 16% of accepted papers)

Montreal, Canada

Dec. 2018

ICML 2018

- Poster & Long presentation (top 50% of accepted papers)

Stockholm, Sweden

Jul. 2018

NIPS 2017

- Poster & Spotlight presentation (top 17% of accepted papers)

Long Beach, USA

Jun. 2017

Visit at **Stanford Artificial Intelligence Lab**

- Oral presentation ([slides](#))

Stanford, USA

Jun. 2017

European Workshop on Reinforcement Learning (**EWRL**, 13th edition)

- Poster & Oral presentation ([slides](#))

Barcelona, Spain

Dec. 2016

Visit at the **Computer Science Department of Carnegie Mellon University**

Pittsburgh, USA

Oct. 2016

Program Committees

Dec. 2019 **Reviewer**, NeurIPS 2019

Vancouver, Canada

Jun. 2019 **Reviewer**, ICML 2019

Long Beach, USA

Oct. 2018 **Organizer & Chair**, European Workshop on Reinforcement Learning (**EWRL**, 14th edition)

Lille, France

Jul. 2018 **Reviewer**, Workshop on Prediction and Generative Modeling in Reinforcement Learning

Stockholm, Sweden

Jul. 2018 **External reviewer**, ICML 2018

Stockholm, Sweden

Dec. 2018 **Reviewer**, Workshop on Learning with Limited Labeled Data: Weak Supervision and Beyond

Long Beach, USA

Dec. 2018 **External reviewer**, NIPS 2017

Long-Beach, USA

Skills

Operating Systems Intermediate: Linux, Windows.

Programming Languages Intermediate: PYTHON, JAVA, MATLAB. Basic: C, C++.

Languages

French Mother tongue

English High proficiency

Italian Good command