Emilie Kaufmann

CNRS Junior Researcher, CRIStAL

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Professional Experience

oct. 2015 -	**CNRS Junior Researcher (CRCN)**. Centre de Recherches en Informatique, Signal et Automatique de Lille (CRIStAL), Scool team.
2014 -2015	**Post-doctoral researcher at Inria (Paris)**. Project-team DYOGENE, under the spervision of Marc Lelarge.
2011 -2014	**PhD candidate and teaching assistant**. Telecom ParisTech & Université Pierre et Marie Curie.

Education

2011-2015	**PhD in Statistics**, *Telecom ParisTech*. *Analysis of Bayesian and frequentist strategies for sequential resource allocation*, under the supervisions of Olivier Cappé (LTCI, Telecom ParisTech), Aurélien Garivier (Université Paul Sabatier, Toulouse) and Rémi Munos (Inria Lille). **Prix de thèse Jacques Neveu 2014**.
2010-2011	**M.Sc. in Statistical Learning (MVA master)**, *ENS de Cachan*. Obtained with highest honnors.
2009-2010	**Agrégation de Mathématiques**, *ENS de Cachan*. Competitive exam to be a maths teacher. Ranked 30/263.
2009	**Admission in third year at ENS de Cachan**, *Mathematics departement*.
2007-2009	**Bachelor, Master 1 in fundamental mathematics**, *Université de Strasbourg*.

Selected publications

- M. Aziz, E. Kaufmann, M. Riviere, *On Multi-Armed Bandit Designs for Dose-Finding Trials*. Journal of Machine Learning Research, 22(14):138.
- E. Kaufmann, P. Ménard, O. Darwhiche Domingues, A. Jonsson, E. Leurent and M. Valko, *Adaptive Reward-Free Exploration*. International Conference on Algorithmic Learning Theory (ALT), 2021.
- D. Baudry, E. Kaufmann, O. Maillard, *Sub-sampling for Efficient Non-Parametric Bandit Exploration*. Advances in Neural Information Processing Systems (NeurIPS), 2020.
- X. Shang, R. de Heide, E. Kaufmann, P. Ménard and M. Valko. *Fixed Confidence Guarantees for Bayesian Best Arm Identification*. International Conference on Artificial Intelligence and Statistics (AISTATS), 2020.
- C. Réda, E. Kaufmann, A. Delahaye-Duriez. *Machine learning applications in drug development*. Computational and Structural Biotechnology Journal 18: 241-252, 2020.
- E. Kaufmann, W. Koolen and A. Garivier, *Sequential Test for the Lowest Mean: From Thompson to Murphy Sampling*. Advances in Neural Information Processing Systems (NeurIPS), 2018.
- L. Besson and E. Kaufmann. *Multi-Player Bandits Revisited*. International Conference on Algorithmic Learning Theory (ALT), 2018.
- E. Kaufmann and W. Koolen. *Monte-Carlo Tree Search by Best Arm Identification*. Advances in Neural Processing Systems (NIPS), 2017.
- E. Kaufmann and A. Garivier, *Learning the distribution with largest mean: two bandit frameworks*. ESAIM: Proceedings and Surveys, Vol 60:114-131, 2017.
- E. Kaufmann, *On Bayesian Index Policies for Sequential Resource Allocation*. Annals of Statistics, Vol 46(2): 842-865, 2017.
- A. Garivier and E. Kaufmann, *Optimal Best-Arm Identification with Fixed Confidence*. Proceedings of the 29th Conference on Learning Theory (COLT), 2016.

Selected Invited Talks

- Workshop on Reinforcement Learning Theory @ ICML 2021 (virtual).
  On pure exploration in (episodic) Markov Decision Processes.
- Workshop Mathematics of Online Decision Making, Simmons Institute, USA. November 2020 (virtual).
  On the complexity of learning good policies with and without rewards.
- MAPLE workshop (Markets, Algorithms, Prediction and Learning), Milan, September 2019.
  Practical algorithms for multi-player bandits.
- Plenary Conference, GRETSI, Lille, August 2019.
  Statistical tools for sequential decision making.
- AAAI workshop on Reinforcement Learning for Games, Honolulu, January 2019.
  Beyond classical bandit tools for Monte-Carlo Tree Search.
- Paris Symposium on Game Theory, Institut Henry Poincaré, June 2018.
- Workshop on Modern Challenges for Learning Theory, Université de Montréal, April 2018.
  Bandit (for) Games.
- Workshop on Optimization and Decision-Making Under Uncertainty, Simons Institute, Berkeley, September 2016. *Revisiting the Exploration-Exploitation tradeoff in Bandit Models.*
- Meeting of the French Mathematical Society, Tours, France, June 2016.
  Bayesian and frequentist strategies in a bandit model.
- Workshop on Computational and Statistical Trade-offs in Learning , IHES, March 2016.
  Optimal Best Arm Identification with Fixed Confidence

Supervision

Post-doc
- Rianne De Heide (2021-). BOLD project + Rubicon grant.
- Pierre Ménard (2019-2021), with Michal Valko (DeepMind). DELTA project.

PhD supervision
- Marc Jourdan (2021-), *Pure Exploration in a Small Samples Regime*, with Rémy Degenne (Inria Scool). Thèse IA Université de Lille.
- Clémence Reda (2019-), *Machine Learning for Drug Repurposing*, with Andrée Delahaye-Duriez (INSERM, Paris). Financement spécifique normalien.
- Dorian Baudry (2019-), *Efficient Exploration in Structured Bandits and Reinforcement Learning*, with Odalric-Ambrym Maillard (Inria Lille). CNRS funding.
- Omar Darwiches-Domingues (2018-), *Reinforcement Learning in Non-Stationary Environements*, with Michal Valko (DeepMind). DELTA project.
- Xuedong Shang (2017-2021), *Adaptive Methods for Optimization in a Stochastic Environement*, with Michal Valko (DeepMind). Financement spécifique normalien.
- Lilian Besson (2016-2019), *Bandits Tools for Modelling IoT Communications*, with Christophe Moy (CentraleSupélec Rennes). Financement spécifique normalien.

Visiting PhD students
- Rianne de Heide (April-July 2019), CWI, Amsterdam.
- Han Shao (October-November 2018), Chinese University of Hong-Kong.
- Maryam Aziz (May-August 2016), Northestearn University (Boston).

Master thesis
- Paul Daoudi (December-June 2020), Univ. Lille & Ecole Centrale de Lille.
- Clémence Reda (April-August 2019), with Andrée Delahaye-Duriez (INSERM). ENS Cachan.
- Cindy Trinh (December-June 2019), Univ. Lille & Ecole Centrale de Lille.
- Xuedong Shang (February-June 2017), with Michal Valko (Inria Lille). ENS Rennes.

Teaching Activities

2020-	**Sequential Decision Making**, *Master 2 Data Science, Université de Lille*, 24h.
2019-	**Reinforcement Learning class**, *Ecole Centrale de Lille (3rd year)*, 20h.
2017-2020	**Data Mining class, Master 1 Maths/Finances**, *Université de Lille*, 36h.

2017,2018	**Machine Learning class, Master 2 Maths/Finances**, *Université de Lille*, 18h.
2017-2019	**Jury de mathématiques du concours d'entrée à l'ENS en section B/L**. preparing the subject, grading, oral examinations.
2015-2017	**Practical session of Reinforcement Learning**, *ENS de Cachan*, 8h.

Responsabilities

Collaborative projects
- ANR BOLD, PI: Vianney Perchet, with ENS Paris-Saclay, Université Paris-Nanterre, Inria Paris, Université de Toulouse. 2019-2022.
- CNRS/INSERM project Repos (*around drug repurposing*), PI: Andrée Delahaye-Duriez (INSERM). April-December 2019.
- Inria/CWI associated team 6PAC (PI: Benjamin Guedj and Peter Grünwald). 2018-2021
- Chist Era DELTA (*Dynamically Evolving Long-Term Autonomy*), PI: Anders Jonsson, with Université de Liège, University Pompeu Fabra and University of Leoben. 2018-2021.
- Project PEPS BIO (*Bandits pour l'Internet des Objets*), with Lilian Besson and Christophe Moy. March-December 2017.
- ANR BADASS (*BAnDits Against non-Stationarity and Structure*), ANR JCJC of Odalric-Ambrym Maillard. 2016-2020.

Organization of events
- Reinforcement Learning Summer School in Lille, 2019. `https://rlss.inria.fr/`. Main organizer with Philippe Preux.
- Organization of the DatinG thematic group meeting at CRIStAL in March 2017.
- Organization of the SequeL seminar from 2016 to 2018.

Reviewing activity
- Reviews for journals: JMLR, Automatica, Operation Research, IEEE Transactions on Information Theory, ACM, Theoretical Computer Science.
- Programm commitee member for COLT 2016, 2017, ALT 2019, 2020, NeurIPS 2020, JFPDA 2018, Women in Machine Learning (WiML) 2018, ALT 2021, ALT 2022.
- Reviewer for AISTATS, NeurIPS, ICML, COLT, ALT...