

Aurélien Garivier



Born 1979.09.24 in Annecy (74), France
married, 3 enfants

ADMINISTRATIVE SITUATION

Full Professor of Mathematics and Computer Science
École Normale Supérieure de Lyon
Unité de Mathématiques Pures et Appliquées (UMPA) UMR CNRS 5669
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CAREER PROGRESSION

- 1999-2003 : **Elève normalien** at ENS Cachan
magistère (double cursus) mathematics / computer science, agrégation de mathématiques
- 2003-2006 : **PhD** (Allocataire-Moniteur) at Université Paris Sud Orsay, defended 2006.11.23
- 2006-2007 : **Junior research and teaching position** (ATER) à l'ENS Cachan
- 2007-2012 : **Junior Researcher at CNRS at LTCI** (Telecom ParisTech)
Habilitation à diriger des recherches 2011/11/28
- 2012-2018 : **Full Professor** at Université Paul Sabatier, Institut de Mathématiques de Toulouse
- 2018- : Full Professor at **ENS Lyon**, UMPA and LIP

Laureate of PES/PEDR (2010: CNRS, 2013, 2017: UPS)

RESEARCH TOPICS

Statistical Learning, Reinforcement Learning: dynamic resource allocation, sequential decision theory, bandit problems, MDPs

Model Selection: Minimum Description Length (MDL), oracle inequalities, BIC criterion

Markov Model: particule filters for hidden Markov Models, Variable Length Markov Chains (VLMC), estimation, perfect simulation

Information Theory: source coding, universal coding, non-parametrics, pattern coding

Main grants:

past: ANR SPADRO (120k€, PI, 2013-2017), ANR ALICIA (1M€, partner leader with 87k€, 2013-2017)

present: IDEX Impulsion (PI, 70k€, **2019-2021**), Fonds Recherche Attractivité (PI, 90k€, **2019-2022**).

MAIN ADMINISTRATIVE RESPONSIBILITIES

- 2016-2018 **Director of the Maths (teaching) Department at Université Paul Sabatier**
- 2014-2016 Member of the **Labex CIMI Executive Committee**
- 2013- Member of the executive committee of the Scientific Committee of IMT, member of the group in charge of local promotion
- 2009- member of various recruitment and evaluation committees

MAIN SCIENTIFIC RESPONSIBILITIES

- 2019: **PC co-chair of ALT'2019** in Chicago
- 2019: **President of the Scientific Committee** of the Journées de Statistiques of SFDS
- 2016-2018: **Founder and Head of the Project-team AOC (Apprentissage, Optimisation, Complexité)** a research group of circa 20 researchers in labex CIMI
- 2013-2017: **PI and responsible of the ANR projet Spadro** (Statistique semi-Paramétrique pour l'Allocation Dynamique de Ressources et l'Optimisation, aap blanc)
- 2013-2017: **Local responsible for IMT of the ANR Project Alicia** (aap CONTINT)
- 2014- : Deputy Director of the **CNRS GDR MaDICS**
- 2014: Main organizer of the **Journées MAS** in Toulouse (227 participants)
- 2012-: Member of the executive committee of the **SMAI group MAS**
- 2013-2016: Co-organizer of various **Thematic Semesters and Workshops** at UPS (150-200 participants), dedicated to big data, machine learning, geometry and statistics, etc.
- 2012 : co-organizer of a **challenge** at ICML workshop « Exploration and Exploitation 3 »
- 2009-2012 : Participant in the management of the French-Brazilian collaboration program **COFECUB**
- **Reviewer** for many journals and conferences : IEEE-Transaction on Information Theory, Annals of Statistics, Bernoulli, Journal of Machine Learning Research (JMLR), Stochastic Processes and their Applications, IEEE-Transaction on Signal Processing, IEEE Transactions on Automatic Control, AStA Advances in Statistical Analysis, Communications in Statistics - Theory and Methods, Automatica, NeurIPS, COLT, ALT, ICML Eusipco...
- **Associate Editor** for the journal Stochastics, **PC member** of many ML conferences (latest : **area chair for Neurips'2019**)

PEDAGOGICAL RESPONSIBILITIES

- 2012-2016: Responsible for the **Cursus de Master en Ingénierie Statistique et Informatique Décisionnelle** (bachelor + master of data science) at UPS
- 2009-2012: Mathematics Coordinator **jury of admission at Ecole Normale Supérieure de la rue d'Ulm voie BL**, written and orale examinations
- 2007-2019: In charge of a large number of courses in engineering schools and universities, mostly in Machine Learning and Statistics (but also probability, general mathematics, etc.)

SUPERVISION

- 2007-2010: **Sarah Filippi**, PhD with Orange Labs on Optimistic Strategies in Reinforcement Learning, with Olivier Cappé et Eric Moulines. Sarah is now Lecturer in the Faculty of Medicine and School of Public Health at Imperial College (UK).
- 2010-2014: **Emilie Kaufmann**, PhD on the analysis of Bayesian and frequentist strategies for sequential resource allocation, with Olivier Cappé and Rémi Munos. Emilie is now Researcher at CNRS (Lille).

- 2013-2016: **Jonathan Louédéc**, PhD on the adaptive modelling of visual exploration systems for information flows, with Josiane Mothe and Max Chevallier. Jonathan is now researcher at Cdiscount (Bordeaux).
- 2013-2016: **Wenjuan Wang**, PhD on optimization for statistical learning with uncertain data, with Nicolas Couellan et Kerstin Bystricky. Wenjuan is now Postdoc at King's College London (UK) .
- 2014-2017: **Tatiana Labopin-Richard**, PhD on statistical and machine learning methods for the validation of stochastic computer experiment with applications to renewable energy, with Fabrice Gamboa and Bertrand Iooss. Tatiana is now a teacher in Classes Préparatoires.
- 2015-2018 : **Pierre Ménard**, PhD on the notion of optimality in the stochastic multi-armed bandit problems, with Gilles Stoltz. Pierre is now PostDoc at INRIA Lille.
- 2016-: **Léonard Torossian**, PhD with INRA on metamodels and robust optimization with application to the design of ideotypes under climate uncertainty, with Robert Faivre and Victor Picheny.
- 2016-: **Mastane Achab**, Phd on extreme-based risk measures and bandit problems, with Stéphan Cléménçon and Anne Sabourin.
- 2017: **Pascal Dkengne Sielenou**, 1 year postdoc for Project ALICIA, in collaboration with AlephD. Pascal is now Postdoc at Université de Grenoble.
- 2019-: **Tomas Kocak**, Postdoc on sequential decision theory with graphs.
- 2019-: **Juliette Achdou**, PhD at 1000Merci on bandit strategies for targeted online marketing, with Olivier Cappé.

I also supervised 15 Master internships, mostly on stochastic and statistical modelling.

SELECTION OF 5 JOURNAL PUBLICATIONS (representative of my thematic evolution)

- Explore First, Exploit Next: The True Shape of Regret in Bandit Problems
Aurélien Garivier, Pierre Ménard, Gilles Stoltz
Mathematics of Operations Research vol 44(2), May 2019, pp.377-399
- Kullback-Leibler Upper Confidence Bounds for Optimal Sequential Allocation
Olivier Cappé, Aurélien Garivier, Odalric-Ambrym Maillard, Rémi Munos, Gilles Stoltz
Annals of Statistics vol.41(3), Jun. 2013, pp.1516-1541
- Optimal discovery with probabilistic expert advice: finite time analysis and macroscopic optimality
S. Bubeck, D. Ernst, A. Garivier
Journal of Machine Learning Research vol.14, Feb. 2013, pp.601-623
- Sequential Monte Carlo smoothing for general state space Hidden Markov Models
Randal Douc, Aurélien Garivier, Eric Moulines, Jimmy Olsson
Annals of Applied Probability vol.21(6), Dec. 2011, pp.2109-2145
- Context Tree Selection: A Unifying View
Aurélien Garivier, Florencia Leonardi
Stochastic Processes and their Applications vol.121(11), Nov. 2011, pp.2488-2506
- Coding on countably infinite alphabets
S. Boucheron, A. Garivier, E. Gassiat
IEEE-Transactions on Information Theory vol. 55(1), Jan. 2009, pp.358-373

SELECTION OF 5 CONFERENCE PUBLICATIONS

- Sequential Test for the Lowest Mean: From Thompson to Murphy Sampling
Emilie Kaufmann, Wouter M. Koolen, Aurélien Garivier
Neural Information Processing Systems n°32, Dec. 2018
- Optimization of a SSP's Header Bidding Strategy using Thompson Sampling
Grégoire Jauvion, Nicolas Grislain, Pascal Dkengne Sielenou, Aurélien Garivier, Sébastien Gerchinovitz
Special Interest Group on Knowledge Discovery and Data Mining 2018
- On Explore-Then-Commit Strategies

Aurélien Garivier, Emilie Kaufmann, Tor Lattimore

Neural Information Processing Systems n°30, Dec. 2016

- Optimal Best Arm Identification with Fixed Confidence
Aurélien Garivier, Emilie Kaufmann
Conference On Learning Theory n°29, Jun. 2016, pp.998-1 027
- The KL-UCB Algorithm for Bounded Stochastic Bandits and Beyond
Aurélien Garivier, Olivier Cappé
Conference On Learning Theory n°24, Jul. 2011, pp.359-376

SELECTION OF 5 INVITED CONFERENCES

- *July 2017: **FoCM2017** (Barcelona, Spain), *The Complexity of Best-Arm Identification**
- *Workshop on Stochastic Computation*
- *March 2015: **Information Theory, Learning and Big Data Workshop at Simons Institute** (Berkeley, USA), *On the Complexity of Best Arm Identification in Multi-Armed Bandit Models**
- *Octobre 2014: **Multi-armed bandits meeting in Imperial College** (Londres, Angleterre)
*Best arm identification and Optimal exploration**
- *Septembre 2013: **IEEE Information Theory Workshop** (Séville, Espagne), *Informational Confidence Bounds for Self-Normalized Averages and Applications**

I also mention here two courses for researchers:

- *March 2019: **Journées Calcul et Apprentissage du GDR Calcul**, 3h course on Machine Learning.*
- *Septembre 2014: **École d'été pluridisciplinaire de Théorie des Jeux** (Aussois), 4h course on Machine Learning and Games*

*My complete list of publications, presentations, notes and more are available on my webpage:
<http://perso.ens-lyon.fr/aurelien.garivier>*