

Emmanuel Rachelson

Senior Researcher – Reinforcement Learning, Machine Learning, Optimization



Summary

Experienced research scientist and academic leader with 15+ years of experience in Reinforcement Learning, Machine Learning, and Optimization for sequential decision-making problems. Proven track record in leading research initiatives, developing graduate curricula, and advancing both theoretical and applied AI.

Research interests

Reinforcement Learning
Sequential Decision Making
Machine Learning
Deep Learning
Optimization
Operations Research
Real-world applications

Leadership & Teaching

Research group direction
Mentoring
Curriculum design
Graduate instruction

Languages

French (native)
 English (fluent)
 Spanish (basic)
 Japanese (beginner)
 Python, C/C++

Links



Hobbies

Judo, mountain sports, paragliding, guitar

EXPERIENCE (SELECTED SERVICE AND ACHIEVEMENTS)

- 2011–2026 **Professor of Machine Learning & Optimization**
 ISAE-SUPAERO, Toulouse, France
Research in Reinforcement Learning and Sequential Decision Making
ANITI research chair on Frugal Reinforcement Learning
Founder & team leader of the Supaero Reinforcement Learning Initiative
Supervised 17 PhD students
Funding and research project management
European Workshop on RL program chair (2023, 2024) and general chair (2024)
Masters program curriculum design and team leadership
Lecturer in Reinforcement Learning within the MVA Master program
Elected ISAE-SUPAERO board member
Representative at the Toulouse Mathematics & Computer Science Doctoral School
- 2009 & 2011 **Researcher in Machine Learning & Optimization**
 EDF R&D, Clamart, France
Applied ML and optimization for operational energy challenges
- 2010 **Postdoctoral Researcher**
 UNIVERSITÉ DE LIÈGE, Liège, Belgium
Offline reinforcement learning, EDA Optimization
- 2009 **Postdoctoral Researcher**
 TECHNICAL UNIVERSITY OF CRETE, Chania, Greece
Reinforcement learning for control of nonlinear systems
- 2005–2008 **PhD candidate**
 ONERA, Toulouse, France
Planning under uncertainty in time-dependent environments

EDUCATION

- 2020 **Habilitation à diriger des recherches (habilitation to supervise research)**
 Université Toulouse 1 Capitole
Reinforcement learning and optimization, a few contributions
- 2009 **Ph.D. in Embedded systems (Artificial Intelligence & Computer Science)**
 ISAE-SUPAERO
Temporal Markov decision problems — formalization and resolution
- 2005 **Grande Ecole engineering degree & MS in Control Systems**
 ISAE-SUPAERO & Université Toulouse 3 Paul Sabatier

PUBLICATIONS (SELECTED)

- Google scholar: <https://scholar.google.fr/citations?user=KtG9BSgAAAAJ>
- On the locality of action domination in sequential decision making.* Rachelson, E., & Lagoudakis, M. G. (ISAIM 2010).
- Non-stationary Markov decision processes, a worst-case approach using model-based reinforcement learning.* Lecarpentier, E., & Rachelson, E. (NeurIPS 2019).
- Lipschitz lifelong reinforcement learning.* Lecarpentier, E., Abel, D., Asadi, K., Jinnai, Y., Rachelson, E., & Littman, M. L. (AAAI 2021).
- Randomized rounding algorithms for large scale unsplittable flow problems.* Lamothe, F., Rachelson, E., Hait, A., Baudoin, C., & Dupé, J. B. (Journal of Heuristics, 2021).
- Look where you look! Saliency-guided q-networks for generalization in visual reinforcement learning.* Bertoin, D., Zouitine, A., Zouitine, M., & Rachelson, E. (NeurIPS 2022).
- When, where, and how to add new neurons to ANNs.* Maile, K., Rachelson, E., Luga, H., & Wilson, D. G. (AutoML 2022).
- Large batch experience replay.* Lahire, T., Geist, M., & Rachelson, E. (ICML 2022).
- Time-constrained robust MDPs.* Zouitine, A., Bertoin, D., Clavier, P., Geist, M., & Rachelson, E. (NeurIPS 2024).
- Exploration by learning diverse skills through successor state representations.* Le Tolguenec, P. A., Besse, Y., Teichteil-Koenigsbuch, F., Wilson, D., & Rachelson, E. (NeurIPS 2024).
- A Markov decision process for variable selection in Branch & Bound.* Strang, P., Ales, Z., Bissuel, C., Juan, O., Kedad-Sidhoum, S., & Rachelson, E. (NeurIPS 2025).
- Learning to Repair Infeasible Problems with Deep Reinforcement Learning on Graphs.* Zouitine, M., Berjaoui, A., Lagnoux, A., Pellegrini, C., & Rachelson, E. (LION 2025).