Salah Chikhi

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Publications & Preprints

Adaptive Scheduling Pipeline for Multi-Instance Asynchronous Reinforcement Learning.
Salah Chikhi*, Luis Henrique Zuin Ruiz*, Entong Li, Zeng Li. **NeurIPS Main Track 2026 (accepted).** OpenReview

Taylor Representations for Model-Free RL in Networked MDPs.
Salah Chikhi, Abdelhaq Chaoui, Asuman Ozdaglar, Saurabh Amin. Submitted to **ICLR 2027**. arXiv:2610.05456

Last-Iterate Performance of Gradient Descent and Relaxed Proximal Point via s-Composability.
Salah Chikhi. *Preprint, 2026.* arXiv:2609.13765

An Analytical Framework for the Levine Hats Problem: New Strategies, Bounds and Generalizations.
Clément Bouquet*, **Salah Chikhi***, Timothé Charles, Yanghao Zhou, Eric Wang. *Preprint, 2025.* arXiv:2508.01737

Education

University of Oxford | *MSc in Mathematical Sciences (OMMS)* Oxford, UK | 2026–2027

- Relevant Coursework: Theories of Deep Learning, Continuous Optimization, Random Matrix Theory, Advanced Topics in Statistical Machine Learning, Perturbation Theory, Stochastic Analysis and PDEs, Numerical Linear Algebra, Algorithmic Foundations of Learning

École polytechnique | *Ingénieur Polytechnicien (MSc)* Palaiseau, France | 2023–2027

- GPA: 4.08/4.0 — Master's in Applied Mathematics.
- Relevant Coursework: Optimization for AI, Deep Learning, Optimization & Control, Statistics and Learning, Advanced Probability, Stochastic Calculus, Advanced Statistical Learning, Complex Analysis and Differential Calculus.

Lycée du Parc | *Classes Préparatoires MPSI–MP* (BSc equivalent)* Lyon, France | 2021–2023

- GPA: 4.0/4.0 — Intensive two-year program in mathematics, physics, and computer science; selected for the *MP** (Advanced Maths & Physics) track.

Research Experience

Massachusetts Institute of Technology | *Visiting Student Researcher* Cambridge, MA | March 2026 – September 2026

- Conducted research with **Prof. Asuman Ozdaglar** and **Prof. Saurabh Amin** on reinforcement learning for high-dimensional networked MDPs and optimization under partial information.
- **Scalable Model-Free RL:** Developed scalable Taylor representations for Q-functions in high-dimensional networked MDPs, exploiting local interactions to reduce representation size from $\Theta(N^n)$ to $O(\Delta^{\kappa n})$ per agent.
- Built a **model-free, scalable actor–critic algorithm** with convergence guarantees, matching or outperforming state-of-the-art spectral baselines across challenging large-scale benchmarks (LQR, switched LQR, Kuramoto oscillator).
- **Partially Observed Linear Optimization:** Studied how to solve linear programs when the objective is only partially observed, minimizing the amount of data required while guaranteeing worst-case regret at most ε.
- Derived optimal observation strategies and computable regret certificates for broad classes of problems, including exact characterizations and $O(\varepsilon^{-1/3})$ data requirements for smooth Matérn-modeled objectives.

Huawei Technologies | *AI Research Intern* Shenzhen, Ox Horn Campus | June–September 2025

- **Large-Scale RL Post-Training:** Designed and implemented **ASP**, an asynchronous RL pipeline for LLM post-training that scales rollout across multiple inference instances while keeping training speed stable.
- Developed a queue-aware scheduler combining output-length prediction and optimization problems solved by dynamic programming and Metropolis-Hastings to reduce wasted generation and stabilize the training queue; scheduling alone improved throughput by **23.4%**, while the full system achieved up to **3.22**× higher end-to-end throughput and **76%** lower iteration time.
- Deployed ASP in an internal telecom LLM training workflow, reducing RL post-training time from **>3 months to 2 months**; associated work was **accepted at NeurIPS 2026 Main Track**.
- Concurrently contributed to a second research team, developing methods to preserve LLM reasoning capabilities during supervised fine-tuning on low-reasoning datasets.

Competitions & Awards

Research Internship Prize, Department of Applied Mathematics – 2026: Prize given at École polytechnique to the 5 best research works, for research conducted at MIT

International Mathematics Competition for University Students (IMC) – 2024: Bronze Medal

French IPhO Selection Test – 2021: Honorable Mention

École polytechnique Mathematics Olympiad Selection Test: Ranked 2nd/80

Huawei Tech Arena - Discrete Optimization Competition 2026: Ranked 3/408 teams as a solo participant, winning 2000 euros.

Teaching

Algerian Team, International Olympiads in AI | *National Coach* 2025–present

- Teaching advanced AI and machine learning courses to national team candidates and selected students, covering both theoretical foundations and competition-oriented problem solving.
- Designing and preparing national selection tests, contributing to problem setting, and grading candidates' submissions to select Algeria's representatives for international AI olympiads.
- Team earned **2 Gold & 2 Silver medals** at AOAI, including **1st and 2nd individual places**, a **Bronze medal** at CEOAI, and a **Silver medal** at IOAI.

École polytechnique | *Teaching Assistant* Palaiseau, France | September 2024 – January 2025

- Led tutoring and review sessions for 2nd-year Bachelor students in topology of normed vector spaces and differential/integral calculus in several variables.

Lycée Saint-Exupéry | *Mathematics Teacher* Mantes-la-Jolie, France | September 2023 – April 2024

- Taught mathematics and STEM subjects to 100+ high-school students; separately prepared three undergraduate-level preparatory classes for France's competitive *grandes écoles* (top universities) entrance examinations.
- Coached 6 high-achieving high-school students for the *Concours Général de Mathématiques*, France's national mathematics competition for top secondary-school students.
- Designed problems and served on the jury of a regional mathematics competition involving three institutions, from problem setting through grading and final evaluation.

Skills & Interests

Languages: French (C2), English (C2 — TOEFL 116/120)
Programming: Python, Java, PyTorch, scikit-learn, Ray, vLLM, pandas, LaTeX
Interests: Basketball, Volleyball, E-Sports (former semi-professional; peak rank **17th/40M** worldwide in Overwatch), Travelling & Culture