Skander Moalla

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EDUCATION

EPFL **Lausanne, Switzerland**
PhD in Computer and Communication Sciences *Sep 2022 – Present* (*graduation expected in Fall 2026*)
Advised by Prof. Caglar Gulcehre on scalable learning from experience: plasticity for continual learning, off-policy/offline reinforcement learning for efficiency, and diversity and agentic systems for test-time scaling.

University of Oxford **Oxford, UK**
MSc in Advanced Computer Science *Oct 2021 – Sep 2022*
MSc thesis in multi-agent reinforcement learning with Prof. Shimon Whiteson's group (WhiRL).

École Polytechnique **Paris, France**
BSc in Mathematics and Computer Science (*Double Major*) *Sep 2017 – Aug 2020*
Graduated Summa Cum Laude — CGPA: 4.09/4.0 — Awarded an excellence scholarship.
Exchange programs: University of Toronto (Fall 2019) & Stanford University (Summer 2019).

EXPERIENCE

Meta FAIR **Paris, France**
Research Scientist Intern *Mar 2026 – Aug 2026*
- Hosted by Julia Kempe and Rémi Munos in the Foundations of Reasoning / Math Superintelligence Team.
- Worked on agentic in-context adaptation, self-improvement, and asymmetric self-play in formal math (Lean).

Google DeepMind **Paris, France**
PhD Student Researcher *Sep 2025 – Dec 2025*
- Hosted by Alexandre Ramé in the Gemma post-training team (Olivier Bachem, Lucas Dixon).
- Worked on leveraging diversity to improve test-time scaling (pass@k) and sampling in reinforcement learning.
- Contributed to the Gemma open-source JAX codebase (Gemma 3 KV cache sharing and sampler).

PUBLICATIONS

Skander Moalla, Ahmad Rammal, Niket Patel, Rémi Munos, and Julia Kempe. h1: A Taste of the Bitter Lesson in Automated Theorem Proving. *Preprint*, **2026**.

Project Apertus, [...], **Skander Moalla***, [...], Antoine Bosselut, Martin Jaggi, and Imanol Schlag. Apertus: Democratizing Open and Compliant LLMs for Global Language Environments. ***ACL***, **2026**.

Simon Matrenok*, **Skander Moalla***, and Caglar Gulcehre. Quantile Reward Policy Optimization: Alignment with Pointwise Regression and Exact Partition Functions. ***NeurIPS***, **2025**.

Skander Moalla, Andrea Miele, Razvan Pascanu, and Caglar Gulcehre. No Representation, No Trust: Connecting Representation, Collapse, and Trust Issues in PPO. ***NeurIPS***, **2024**.

Xiuying Wei, **Skander Moalla**, Razvan Pascanu, and Caglar Gulcehre. Building on Efficient Foundations: Effectively Training LLMs with Structured Feedforward Layers. ***NeurIPS***, **2024**.

Benjamin Ellis, Jonathan Cook, **Skander Moalla**, Mikayel Samvelyan, Mingfei Sun, Anuj Mahajan, Jakob Foerster, and Shimon Whiteson. SMACv2: An Improved Benchmark for Cooperative Multi-Agent Reinforcement Learning. ***NeurIPS***, **2023**.

Skander Moalla*, Manuel Madeira*, Lorenzo Riccio*, and Joonhyung Lee*. [Re] Reproducibility Study of Behavior Transformers. ***ReScience C***, **9**(**2**), **2023. Outstanding Paper Awards Honorable Mentions**.

EXPERIENCE (CONTINUED)

Quincus **Singapore (Remote)**
Applied Research Intern *Mar 2021 – Aug 2021*
- Deployed a solution leveraging deep reinforcement learning (RL) to optimize middle-mile logistics.
- Built simulators to model multi-mile parcel shipping and trained deep RL prototypes (PPO, DQN).
- Stack: Python (OpenAI Gym & Baselines, LightGBM, pytest), Docker, NSCC High-Performance Computing.

Amazon **Luxembourg**
Software Development Intern *Sep 2020 – Feb 2021*
- Completed full-stack and DevOps sprint tasks within a "two-pizza team" owning multiple services end-to-end.
- Designed and built a prototype to detect similar and duplicate business metrics supporting Amazon's transportation network worldwide to ease metric discovery and reduce computation costs leveraging deep learning and NLP techniques with AWS SageMaker.
- Stack: AWS, Python, Java (Dagger, AutoValue, JUnit, Mockito), TypeScript (ImmutableJS, Mocha, Chai).

EPFL – Laboratory for Topology and Neuroscience & Blue Brain Project **Geneva, Switzerland**
Research Intern *Jan 2020 – Apr 2020*
- BSc thesis supervised by Prof. Kathryn Hess Bellwald (Link to thesis).
- Built a framework for neuron simulation and leveraged tools from information theory and algebraic topology (simplicial homology) to formulate new conclusions about the dynamics of neurons forming directed cliques.
- Stack: Python 3 (DIT, JupyterLab, NumPy, SciPy, Brian2), C++.

Ooredoo **Tunis, Tunisia**
Full-Stack Developer Intern *Jul 2018 – Aug 2018*
- Implemented a PoC for a custom notification system in a hybrid mobile app featuring profiling functionalities and allowing Ooredoo to adjust the activity of their notification server. Stack: Ionic 3, Node.js, socket.io.

SOFTWARE

Core stack and responsibilities

Co-lead of the Swiss AI Apertus v1 post-training *July 2024 – Present*
- Developed infrastructure and offline post-training code to train the Swiss open models Apertus 8B and 70B on the CSCS Alps cluster with 1000+ GH200 nodes.
- Supervised MS students on chat templates, evaluations, supervised fine-tuning, multilinguality, and data.

Point of Contact for infrastructure & compute platforms in the lab *Sep 2023 – Present*
- Support the deployment of container-based research experiments on multiple clusters at the scale of hundreds of nodes, including Slurm HPC clusters and Run:AI (Kubernetes-based) clusters. (Documentation)
- Stack: Docker, Kubernetes, Run:AI, Slurm, NVIDIA Pyxis, NVIDIA Enroot, Apptainer/Singularity.

Open-source contributions and selected projects

Open-source contributions
- @PyTorch/RL, @DLR-RM/stable-baselines3, @Farama-Foundation/Gymnasium, @HuggingFace/TRL.

Python Machine Learning Research Project Template *Sep 2022 – Present*
- Maintain a template for reproducible Python machine learning research projects deployable on various platforms including Slurm (with containers through NVIDIA Pyxis/Enroot or Apptainer) and Kubernetes clusters.

TEACHING

Université Dauphine Tunis (Université Paris Dauphine-PSL) **Tunis, Tunisia**
Visiting Lecturer – Reinforcement Learning *Jan 2026*
- Delivered a 24-hour course for the Master's in Big Data & Artificial Intelligence (BDIA).
- Covered reinforcement learning foundations and modern LLM post-training methods such as RLHF.

EPFL **Lausanne, Switzerland**
LauzHack Deep Learning Bootcamp Instructor (Deep Reinforcement Learning) *Jul 2024*
- Delivered a 2-hour introductory lecture on deep reinforcement learning (Bellman equations, DQN, PPO, etc.).

EPFL **Lausanne, Switzerland**
Teaching Assistant & Supervisor *Sep 2022 – Present*
- Supervised 9 Master's projects and theses.
- Probability and Statistics (MATH-232 Spring 2023), Machine Learning (CS-433 Fall 2023 – exam preparation), Artificial Neural Networks / Reinforcement Learning (CS-456 Spring 2024 – project preparation).

ATSM – Tunisian Association of Mathematics **Tunis, Tunisia**
Olympiad Coach *Jul 2018 – Present*
- Designed material for Olympiad problem-solving and trained national team members for the Mediterranean Mathematical Olympiad (MYMC 2018) and the International Mathematical Olympiad (IMO 2020).

SOFTWARE - CLASS PROJECTS

SAM - Study Abroad Matching *Sep 2019 – Dec 2019*
- Designed a web app around an algorithm to match students applying to study-abroad programs and universities based on a human-in-the-loop solution to the Gale–Shapley college admissions problem.
- Stack: Python, Django, React, Google Cloud Platform (GCP), Google App Engine, Google Cloud SQL.

Computer Facial Discrimination - Machine Learning Project *May 2019 – Jun 2019*
- Studied the effect of different pre-trained feature extractors (Autoencoders, CNN classifiers) and clustering methods on the discrimination of human faces.
- Built a customizable autoencoder model to demonstrate that training data (as an analogy for background and culture) can be the root of multiple kinds of discrimination.
- Stack: Python, TensorFlow, Keras, scikit-learn, Google Colab, Kaggle.

TOP5 Basketball Team Manager - C++ Project *Nov 2018 – Jan 2019*
- Managed a team of 9 students / Led the Game Engine team / Maintained the Git repository.
- Designed and implemented the game engine and its interaction with the remaining game entities.
- Stack: C++, Qt.

Meet Halfway - Web Project *May 2018 – Jun 2018*
- Built a user-friendly website that allows a group of friends to find the best destination to travel to and meet for holidays according to their respective locations and cost of travel.
- Stack: HTML, CSS, JS.

EDUCATION - EXCHANGE PROGRAMS

University of Toronto **Toronto, Canada**
Exchange – Fall 2019 — Software Engineering, Databases, Compilers & Interpreters *Sep 2019 – Dec 2019*

Stanford University **Stanford, USA**
Exchange – Summer 2019 — GPA: 4.15/4.0 — AI, Entrepreneurship & Innovation *Jun 2019 – Aug 2019*

LANGUAGES

English: Bilingual French: Native Arabic: Native German: Elementary