

Salem Lahlou

Assistant Professor of Machine Learning

Abu Dhabi - UAE
✉ salem.lahlou@mbzuai.ac.ae
<https://saleml.github.io>

Research interests : Uncertainty in machine learning, Sample-efficient reinforcement learning, AI for science, LLM Reasoning.

Experience

Sep 2024 – current **Assistant Professor of Machine Learning, Mohamed bin Zayed University of Artificial Intelligence (MBZUAI), Abu Dhabi.**

2024 **Senior Researcher, Technology Innovation Institute, Abu Dhabi.**
Reasoning with LLMs

2022 **(Part-time) Scientist in Residence, NextAI, Montréal.**
Consulting and technical guidance for 8 early stage startups using Machine learning in their pipeline.

2020 **Research Intern, Google Research, Paris.**
Research on emergence of hierarchies in social reinforcement learning.

2017 **(Full-time) Data Scientist, Booking.com, Amsterdam.**
Analysis of customers' behaviors in different parts of the website - design and implementations of website features.

2016 **(Internship) Data Scientist, AXA Data Innovation Lab, Paris.**
Research on Bayesian Optimization for hyperparameter optimization - Development of an AutoML platform for prospect acquisition.

2015 **Research Intern, IBM Research Collaboratory, Singapore.**
Research on tradable credits scheme for binary choice games and applications to transport.

2014 **(Internship) Data Scientist, Infosys, Bangalore.**
Study and implementation of Natural Language Processing techniques (TF-IDF, Latent Dirichlet Allocation...) for keyword extraction in large corpora.

Education

2018 – 2023 **Mila - Université de Montreal, Montréal - Canada, PhD, Advances in uncertainty modelling : from epistemic uncertainty estimation to generalized generative flow networks.**
Under the supervision of Yoshua Bengio.

2015 – 2016 **Ecole Normale Supérieure, Cachan - France, M.Sc., Mathematics, Vision, Learning (MVA).**
Graduated with Very High Honors.

2012 – 2016 **Ecole Polytechnique, Palaiseau - France, Cycle Ingénieur polytechnicien (equivalent of B.Sc. + M.Sc.), Major : Applied Mathematics.**
Additional degree from **Télécom ParisTech** for the 2015-2016 school year.

2010 – 2012 **Classes préparatoires, Fès - Morocco, Two-year intensive program in Mathematics, Physics, and Philosophy. Preparation for the competitive entry exams of French Grandes Ecoles .**

Selected publications (* denotes equal contribution in authorship)

2023 **A Theory of Continuous Generative Flow Networks**, Salem Lahlou, Tristan Deleu, Pablo Lemos, Dinghui Zhang, Alexandra Volokhova, Alex Hernández-García, Lena Nehale Ezzine, Yoshua Bengio, Nikolay Malkin. *ICML 2023*.

2022 **GFlowNets and variational inference**, Nikolay Malkin*, Salem Lahlou*, Tristan Deleu*, Xu Ji, Edward Hu, Katie Everett, Dinghui Zhang, Yoshua Bengio. *ICLR 2023*.

2022 **GFlowNet Foundations**, Yoshua Bengio*, Salem Lahlou*, Tristan Deleu*, Edward J. Hu, Mo Tiwari, Emmanuel Bengio. *JMLR 2023*.

2021 **DEUP : Direct Epistemic Uncertainty Estimation**, Salem Lahlou*, Moksh Jain*, Hadi Nekoei, Victor I Butoi, Paul Bertin, Jarrod Rector-Brooks, Maksym Korablyov, Yoshua Bengio. *TMLR 2023*.

2018 **BabyAI : A Platform to Study the Sample Efficiency of Grounded Language Learning**, Maxime Chevalier-Boisvert*, Dzmitry Bahdanau*, Salem Lahlou, Lucas Willems, Chitwan Saharia, Thien Huu Nguyen, Yoshua Bengio. *ICLR 2019*.

- 2016 **A Nash equilibrium formulation of a tradable credits scheme for incentivizing transport choices : From next-generation public transport mode choice to HOT lanes**, *Salem Lahlou, Laura Wynter. Transportation Research Part B 2017.*

Services

2021 – **Supervision or co-supervision.**

- 2023
- Victor Livernoche (M.Sc. student at Mila) - Research project on automatic curriculum learning
 - Anas Krichel (M.Sc. student - intern at Mila) - Research project on exploration in GFlowNets
 - Laura Sanchez Fernandez (M.Sc. student at Mila) - Technical guidance for AI+education start-up proof of concept
 - Shawn Whitfield (M.Sc. student at Mila) - Mentorship during internship in AI+bio start-up

2021 – **Reviewer in major Machine Learning conferences and journals (ICLR, ICML, NeurIPS, 2024 ACL, IEEE TPAMI).**

- 2019 **Creation of the exercises section for the Deep Learning book (MIT Press).**

Teaching experiences

- February (Co-)Main Instructor for graduate level course, Mathematical Foundations for Machine Learning
2024 (Design and teaching of 30h class) - UM6P, Morocco.
- 2019 – Teaching Assistant for graduate level courses, IFT 6135, IFT 6390 - Université de Montréal.
2020
- 2021 Teaching Assistant for IVADO/Mila Deep Learning School, Graduate level training in deep learning.
- 2012 – Instructor for high-school and undergraduate (classes préparatoires) level courses, Mathe-
2015 matics, Physics.

Selected contributions in open-source code repositories

GFlowNet library : generic codebase for GFlowNets in pytorch.

Minigrid : collection of discrete grid-world environment for reinforcement learning.

Languages

Moroccan : Mother tongue

French : Mother tongue

Arabic : Fluent

English : Fluent

Spanish : Moderate level

Miscellaneous

Practiced sports : football, squash, bouldering, scuba diving