

# Salem Lahlou

Last year PhD candidate at Mila - Université de Montréal,  
under the supervision of Yoshua Bengio.

Montréal - Canada  
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<https://github.com/saleml>

**Research interests :** Uncertainty in machine learning, Sample-efficient reinforcement learning, Theoretical guarantees in machine learning, AI for science.

## Education

- 2018 – **Mila - Université de Montreal, Montréal - Canada**, PhD candidate.  
2023 Under the supervision of Yoshua Bengio.  
**Supervision** of interns at Mila, M.Sc. students during their industry internship.  
**Reviewer** in major Machine learning conferences (ICLR, ICML, NeurIPS).
- 2015 – **Ecole Normale Supérieure, Cachan - France**, M.Sc., Mathematics, Vision, Learning (MVA).  
2016 **Graduated with Very High Honors**.
- 2012 – **Ecole Polytechnique, Palaiseau - France**, Cycle Ingénieur polytechnicien (equivalent of B.Sc. plus  
2016 M.Sc.), **Major** : Applied Mathematics.  
Additional degree from **Télécom ParisTech** for the 2015-2016 school year.

## Selected publications (\* denotes equal contribution in authorship)

- 2023 **A Theory of Continuous Generative Flow Networks**, Salem Lahlou, Tristan Deleu, Pablo Lemos, Dinghuai 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, Dinghuai Zhang, Yoshua Bengio. *ICLR 2023*.
- 2022 **GFlowNet Foundations**, Yoshua Bengio\*, Salem Lahlou\*, Tristan Deleu\*, Edward J. Hu, Mo Tiwari, Emmanuel Bengio. *To appear in JMLR*.
- 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*.

## Research experiences in the industry

- 2020 **Research Intern, Google Research, Paris**.  
Research on emergence of hierarchies in social reinforcement learning.
- 2015 **Research Intern, IBM Research Collaboratory, Singapore**.  
Research on tradable credits scheme for binary choice games and applications to transport.

## Other professional experiences

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

## Teaching experiences

- 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**, Mathematics, Physics.  
2015

## 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

French : Mother tongue

Moroccan : Mother tongue

English : Fluent, Full professional proficiency

Arabic : Fluent

Spanish : Moderate level

## Miscellaneous

Practiced sports : Football, Squash, Bouldering