

Maxime Heuillet

Ph.D. candidate in Computer Science

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Education

Ph.D. in Computer Science

2021 - 2026

Université Laval and MILA - Québec AI Institute, Canada

Advisors: Prof. Audrey Durand, Dr. Ola Ahmad

M.Sc. in Statistics and Machine Learning

2017 - 2020

ENSAI - National School of Statistics and Data Analysis (french 'Grande École'), France.

- Admitted among 6 of 191 applicants; lowest admitted rank: 38.
- Research projects with: Prof Emmanuel Curris (Paris-Cité University), Prof. Julien Godet (Strasbourg University) and Prof. Romaric Gaudel (Inria & Rennes University)

Classe Préparatoire aux Grandes Écoles B/L (CPGE)

2015 - 2017

Aix Marseille University, joint program with Lycée Thiers, France.

- Two years intensive program to prepare for the French "Grandes Écoles" competitive exams
- **Majors:** mathematics, economics

Scientific Achievements

Articles in Preparation

1. Accelerating Reinforced Fine-Tuning of Large Language Models
Expected submission: Summer 2025
2. How can LLMs best solve sequential decision making problems?
Expected submission: Summer 2025

Submitted Articles

1. **M. Heuillet**, R. Bhagwatkar, J. Ngnawe, Y. Pequignot, A. Larouche, C. Gagné, I. Rish, O. Ahmad, and A. Durand. *A Guide to Robust Generalization: The Impact of Architecture, Pre-training, and Optimization Strategy*, Submitted to the NeurIPS Datasets and Benchmarks Track (2025).

Papers published in the main track of a conference

Note: Partial monitoring is a sequential decision making framework related to bandits, reinforcement learning and game theory.

1. **M. Heuillet**, O. Ahmad, and A. Durand. *Randomized Confidence Bounds for Stochastic Partial Monitoring*, In proceedings of the International Conference on Machine Learning (2024).
2. **M. Heuillet**, O. Ahmad, and A. Durand. *Neural Active Learning Meets the Partial Monitoring Framework*, In proceedings of the Uncertainty in Artificial Intelligence conference (2024).

Workshop Posters

1. J. Armand, T. C.-H. Lin, **M. Heuillet**, and A. Durand. *Multi-Agent Matrix Games with Individual Learners: How Exploration-Exploitation Strategies Impact the Emergence of Coordination*, Reinforcement Learning Conference 2025 Workshop on Coordination and Cooperation in Multi-Agent Reinforcement Learning (CoCoMARL at RLC 2025).

2. **M. Heuillet** and A. Durand. *Tracking the Risk of a Machine Learning System with Partial Monitoring*, In Safety in Machine Learning workshop at Neurips 2022.
3. M. Godbout, **M. Heuillet**, S. Chandra, R. Bhati, and A. Durand. *A Game-Theoretic Perspective on Risk-Sensitive Reinforcement Learning*. AAAI's Workshop on Artificial Intelligence Safety a, 2022 (spotlight).
4. **M. Heuillet**, Benoit Debaque, and A. Durand. *Sequential AutoML: Bandits-driven Exploration using a Collaborative Filtering Representation*. 8th ICML Workshop on Automated Machine Learning, (2021).
5. M. Traglia, **M. Heuillet**, and L. Weiss. *Male control individuals show higher burden of rare coding SNVs across diverse ancestries*. American Society of Human Genetics Conference, 2019.

Professional Experience

Amazon (Seattle, USA) <i>Incoming Applied Scientist Intern</i>	Fall 2025
Noah's Ark Lab - Huawei Technologies (Montréal, Canada) <i>Associate Research Intern (part-time)</i> Placement via Quantum Technologies Consulting Inc.	Winter – Summer 2025
CortAix Lab - Thales Research and Technology (Montréal, Canada) <i>Research Intern</i>	Fall 2020 - Now
Université Laval <i>Teaching Assistant</i>	2021, 2022
CREST Lab - Center for Research in Economics and Statistics (Rennes, France) <i>Research Intern</i>	Summer 2020
Weiss Lab (UCSF) - University of California San Francisco (San Francisco, USA) <i>Research intern</i>	Summer 2019

Mentorship

Note: These mentorship experiences are either part of work contracts (1 hour / week) or volunteering experiences.

Masters theses

1. **Baptiste Bonin** – Research M.Sc. at Université Laval
Recommending structured sequences of items
Fall 2024 - TBD
2. **Julien Armand** – Research M.Sc. at Université Laval
Characterizing multi-agent learning dynamics (cooperation, competition)
Winter 2025 - TBD

Internships

1. **Vincent Longpré** – Professional M.Sc. internship, at *Caisse de dépôt et placement du Québec*
"LLMs as a judge" techniques to assess quality of information extraction
Winter, Summer 2025
2. **Donald Zvada** – Professional M.Sc. internship at *African Inst. of Math. Sci. in South Africa*
Can large language models solve sequential decision making problems?
Winter, Summer 2025
3. **Frida-Cecilia Acosta Parenteau** – Professional M.Sc. internship, at *SmartOne.AI* startup
Predicting the cost of human data annotations
Summer, Fall 2024
4. **Myyank Shukla** – Professional M.Sc. internship, at *Royal Bank of Canada*
Monitoring for anomaly detection
Fall 2023, Winter 2024
5. **Lorenzo Mathieu** – Professional M.Sc. internship at *Université Laval*
Transfer learning from synthetic to real world data
Summer 2023

6. **Thierry Blais** – B.Sc. internship at *Université Laval*
Neural bandits

Summer, Fall 2022

Awards and scholarships

Mitacs Accelerate, Doctoral level Scholarship 135.000\$ to complete my Ph.D. thesis <i>Partner organization:</i> Thales Research and Technology (CortAIx lab)	2022 - 2026
IVADO Travel grant 3.000\$ to attend a scientific workshop at the University of California in Berkeley (USA) Topic: Future of Language Models and Transformers	2025
Alliance Canada Computing Resources Award Led the application to obtain computing resources for Pr. Durand's group. 2024 - 2025: 11.453\$ for "Online Learning: Bridging Theory and Practice" 2025 - 2026: 21.007\$ for the award renewal	2024 - 2026
UAI 2024 Conference Scholarship 500\$ fee waiver to attend the UAI 2024 conference.	2024
Université Laval Mobility Scholarship 500\$ to present at a scientific conference outside Québec	2024
Scholarship of Excellence in AI and Data Science 7.000\$ from Institute Intelligence and Data (Université Laval)	2022
Université Laval Admission Grant (2.000\$)	2021
Mitacs Accelerate, Master's level Scholarship 15.000\$ for "Recommender Systems for Automated Machine Learning" <i>Partner organization:</i> Thales Research and Technology (CortAIx lab)	2020
Bourse Jeune a Travers le Monde (JTM) 270\$ for an internship abroad in Montréal, Québec	2020
Bourse Jeune a l'International (JALI) 4.000\$ for an internship abroad in San Francisco, California	2019

Community Service

Peer-review contributions

Conference (main-track) Reviewer: ICML 2024, Canadian AI Conference 2024

Workshop Reviewer:

Reinforcement Learning for Real Life (NeurIPS 2022 workshop)
Montreal AI Symposium 2022, Decision Awareness in Reinforcement Learning (ICML 2022 workshop)
Pac-Bayes Meets Interactive Learning (ICML 2023 workshop)
Goal Conditioned Reinforcement Learning (Neurips 2023 workshop)
Explainable AI for Speech and Audio (ICASSP 2024 workshop)
Workshop on Training Agents with Foundation Models (RLC 2024)
Montreal AI Symposium 2024

Program Chair Pac-Bayes Meets Interactive Learning (ICML 2023 workshop),

Admission Committee:

Reviewed international student applications for MILA Ph.D. and M.Sc. programs
Designed fit, technical, and ML interviews for admissions into Université Laval Ph.D. program

Scientific Events Organization

Mila 2024 Workshop on Reinforcement Learning	2023
One day event featuring distinguished speakers and panelists in the field of reinforcement learning.	
ICML 2023 Workshop "Pac-Bayes Meets Interactive Learning " ¹	2023
One day event featuring distinguished speakers and panelists in the field of Pac-Bayes and interactive learning.	
AI tutorials - Université Laval bootcamp 2022 ²	2022
Two-days event with AI tutorials addressed to a non-expert audience.	
ENSAI International alumni day (North America alumni network)	2021
A day to connect current ENSAI students with international alumnis of North America.	
ML Robustness reading group ³	2022
Created a bi-monthly reading group for students interested in the robustness and security of AI	

Talks

1. *Improving cost efficiency across the life cycle of machine learning systems*
 "Carrefour DEEL France - Québec", a transatlantic scientific seminar (2025)
 "Thales Palaiseau Days", a Thales Group internal conference (2024)
2. *Introduction to Reinforcement Learning*
 "AI Bootcamp for students", a department workshop at Université Laval (2022)
3. *Sequential Pipeline Optimization: Bandits-driven Exploration using a Collaborative Filtering Representation*
 "International Workshop on Automation in Machine Learning" at KDD Conference (2021)
 Montréal AI Symposium at Mila (2021)
 Departmental seminars at Université Laval (2022)

Media

Café IA - A weekly podcast on computer science and machine learning news:
 Episode 42 (Retour en classe et apprentissages profonds)
 Episode 44 (De la fabrication de l'éthique robotique et autres sujets connexes)
 Episode 46 (Spécial Halloween - Histoires d'horreur en intelligence artificielle)
 Episode 49 (Le Noël de Charles A.I. Brown - prix Iark et Lovelave 2022)

¹<https://bguedj.github.io/icml2023-workshop/>

²<https://sites.google.com/view/bootcamp-iid-2022/accueil?authuser=1>

³<https://sites.google.com/view/adversarial-robust-ml-reading/accueil?authuser=1>