

The 6th Ivado/Mila Deep Learning School

Mathieu Germain
Frédéric Laurin
Nathalie Sanon



IVADO





What we've learned!

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Topics of each week

Week 1

Machine Learning, Tools and Robustness



Week 2

Deep Learning, Optimization and Self-Supervised Learning



Week 3

Computer vision and Convolutional Neural Networks



Week 4

Natural Language Processing, Recurrent Neural Networks and Transformers



Week 5

Bias and Discrimination in AI



How long do we have access to the school resources?

...



Important dates

Swapcard

- Available until **May 29th**

MOOC

- Available until **May 29th**

Piazza

- With TA support until **April 30th**
- You can still add questions and answer each other until **May 29th**
- **After May 29th**, piazza will still be available
but no new questions nor answers can be added

Live Session Recordings

- Through Swapcard until **May 29th**

Slides & Tutorials

- Through Swapcard until **May 29th**
- Through the school [GitHub](#) ∞



Interesting stats

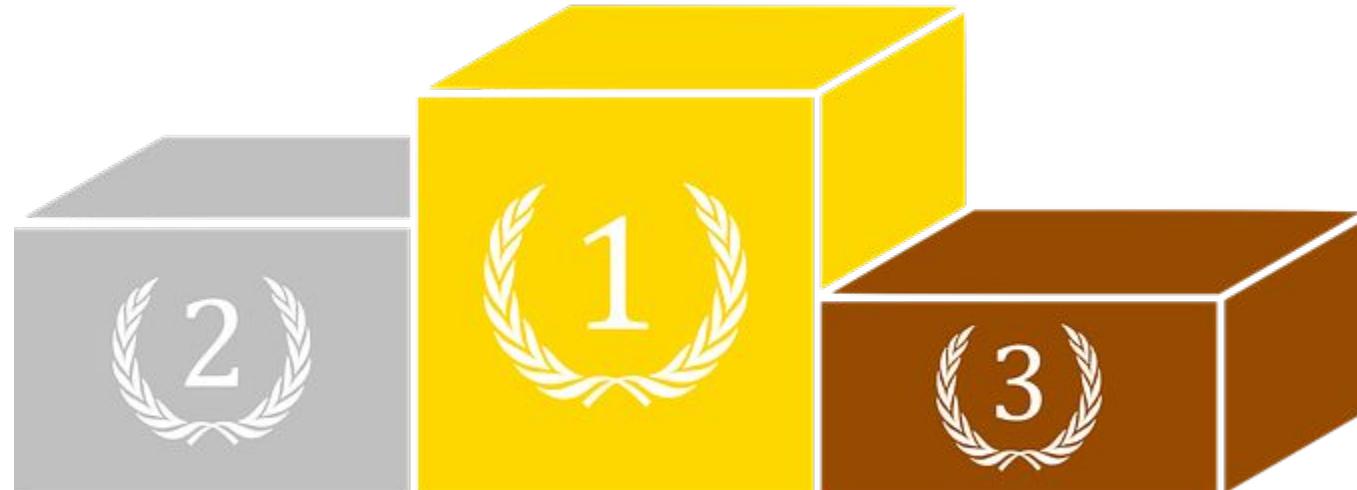
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The school in numbers

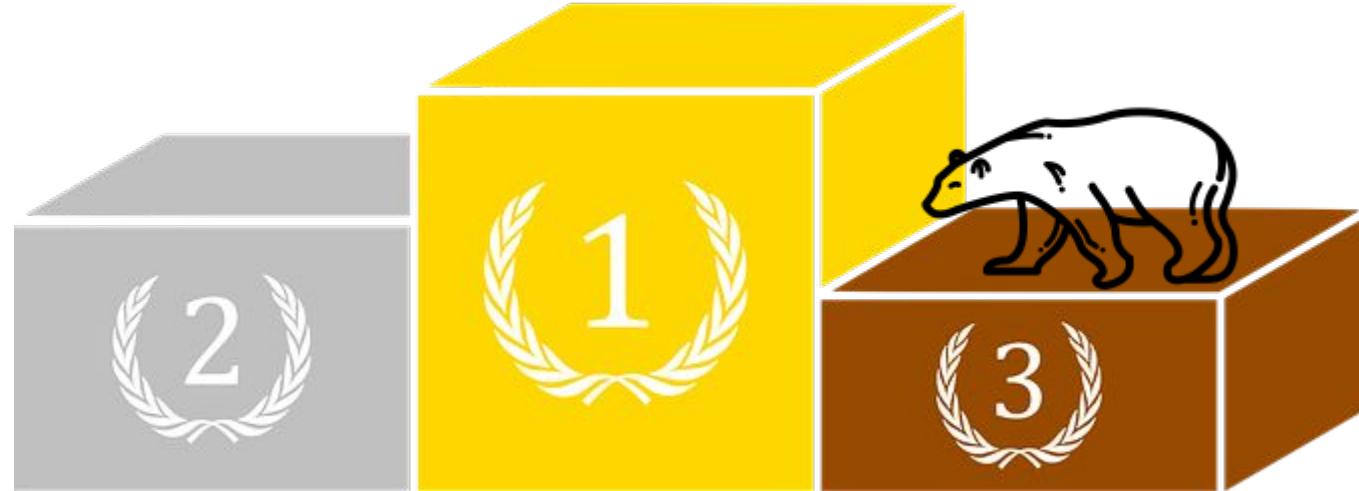
- 390 Attendees!
- Piazza
 - 872 total contributions
 - 115 students answers
- More than 2400 minutes of 1-1s with the TAs
- 590 networking contacts made

Most popular spirit animal



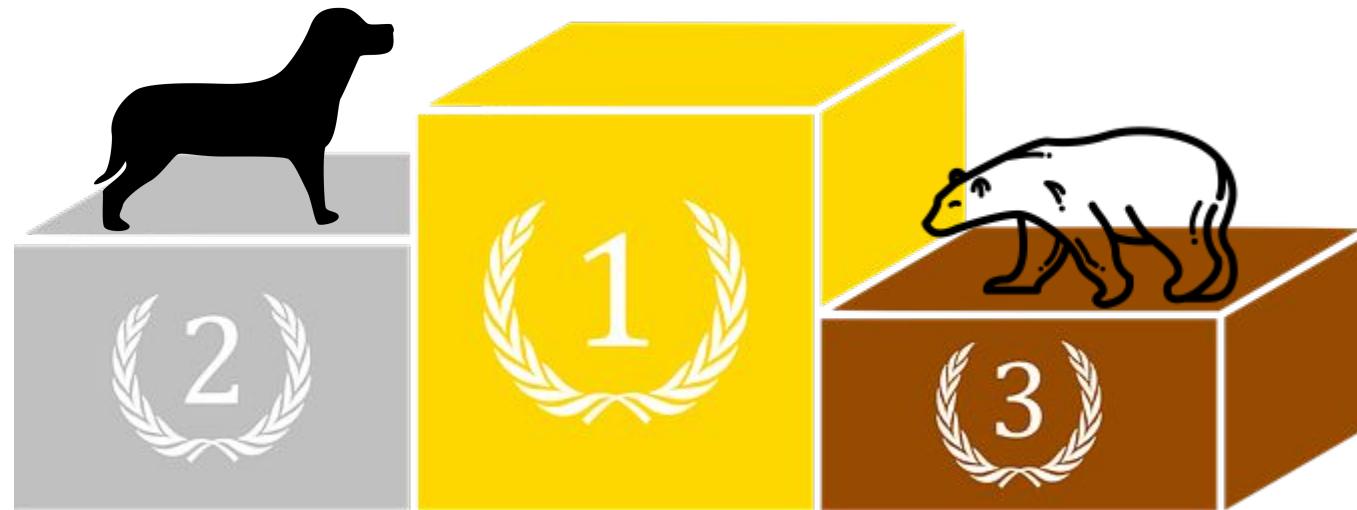


Most popular spirit animal



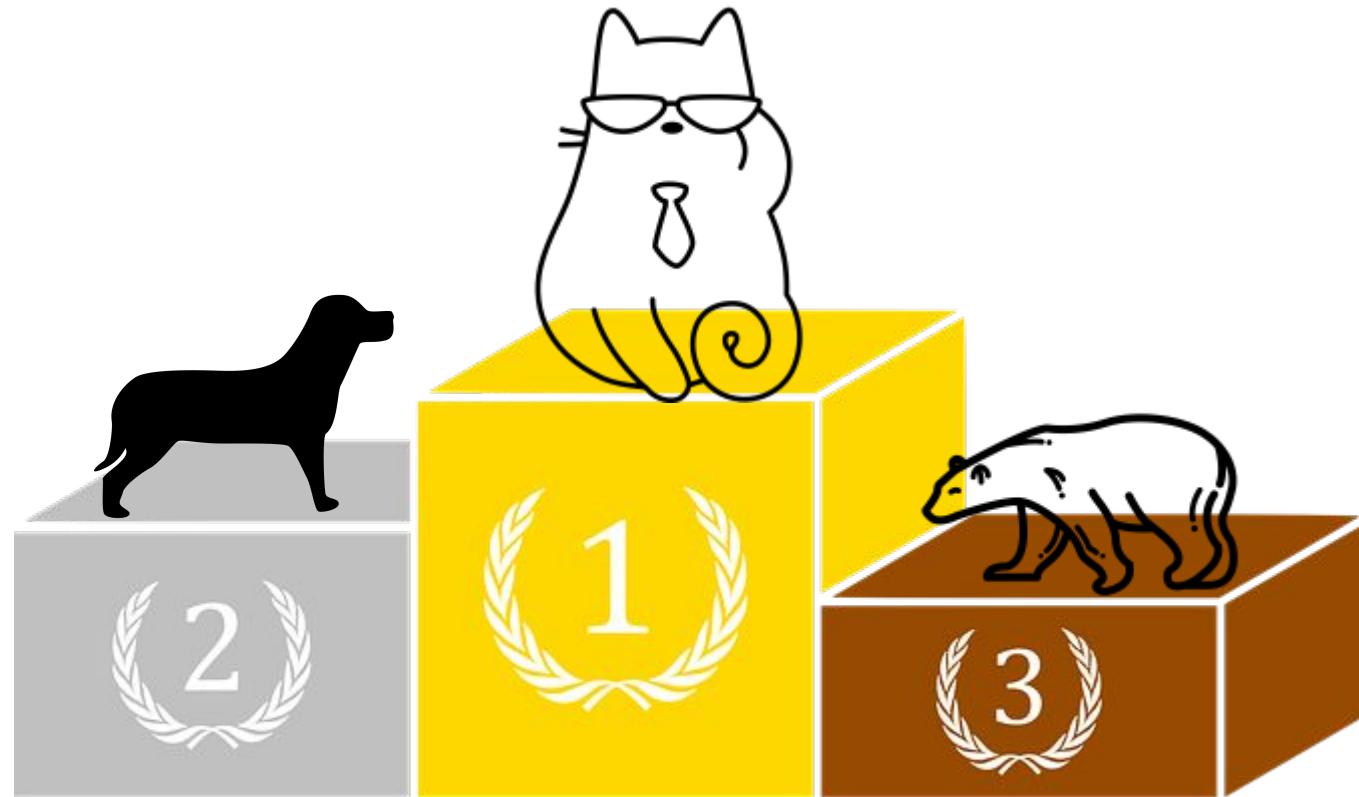


Most popular spirit animal

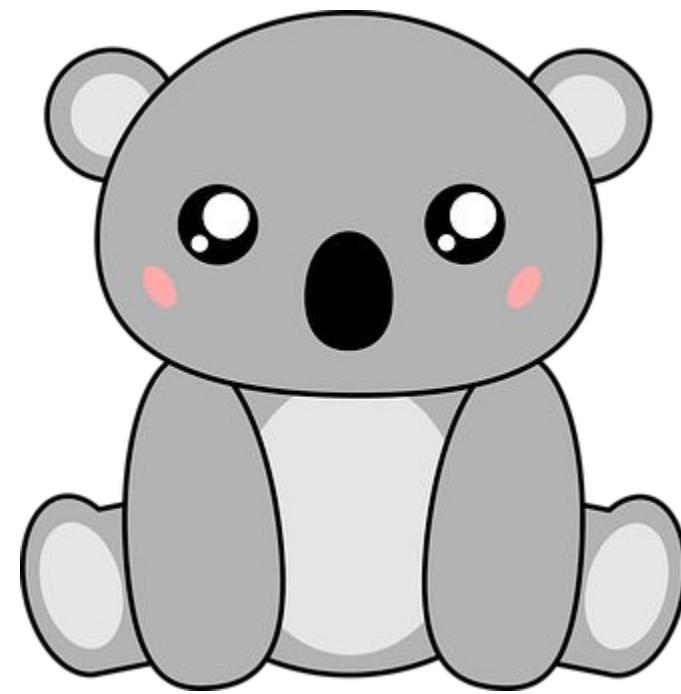
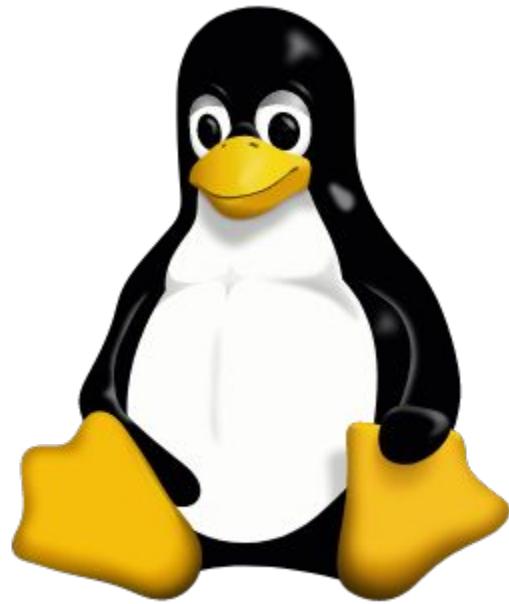




Most popular spirit animal



Most popular spirit animal





Acknowledgments & Contributions

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Acknowledgments & Contributions



The Attendees who:

- Asked the most questions on Piazza
 - Meriem Benhaddi
 - Ryan Ferns
 - Sandra Garcia Rodriguez
- Answered the most questions on Piazza
 - Maxime Cadotte
 - Milad Leyli
 - Aaron Maxwell

Acknowledgments & Contributions



The Attendees who:

- Interacted the most during the live sessions
 - Aaron Maxwell
 - Bobin Wang
 - Yves Terrat
- Networked the most
 - Lokender Sarna
 - Amin Ghazanfari
 - Kim Phan

Acknowledgments & Contributions



The TAs with the most contributions:

- On Piazza
 - Daniele Reda
 - Salem Lahlou
 - Alex Hernandez-Garcia
- In live sessions
 - Pravish Sainath
 - Arian Hosseini
 - Rémi Dion
- In 1-1s
 - Rémi Dion
 - Alex Hernandez-Garcia
 - Jacob Buckman

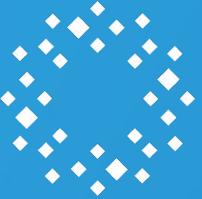
Teaching assistants





We want your
feedback!!!

•••



Mila's Applied Machine Learning Research Team

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A Unique Research Institute in Deep Learning

Mission: To be a global pole for scientific advances that inspires innovation and the development of AI for the benefit of all



Founded in 1993 by Turing Award Laureate, Prof. Yoshua Bengio

In 2019, Mila moved to its unique location in O Mile-Ex creating a **distinctive AI ecosystem**, in which **AI researchers from academia and companies** (large, medium and small) collaborate

Mila's four strategic pillars reflect how it delivers its mission

AI Talent



Advanced Research



Collaboration Projects



Social Influence



Mila's Applied Research Team **collaborates with companies on their machine learning projects**
Deep-dive into this topic in the next pages



Applied Research Projects

Distinctive Features of our Applied AI Team

Privileged **access to Mila's** 500+ faculty and student researchers

Collaborative approach to transfer knowledge to industry researchers

Significant part of the applied research team's **costs covered by Mila funding**

Mutually beneficial agreements regarding **intellectual property**

Meet some of our Experts

Scientific Direction

Joumana Ghosn

- 20+ years in ML/DL
- PhD in ML under the supervision of Y. Bengio



Project Management

Jean-Philippe Nantel

- 10+ years of data science project management
- Eng. and M.Sc. in Applied Math. & Computer Science



Project Lead

Gaétan Marceau Caron

- 9+ years in computer science and ML/DL
- Postdoc in ML



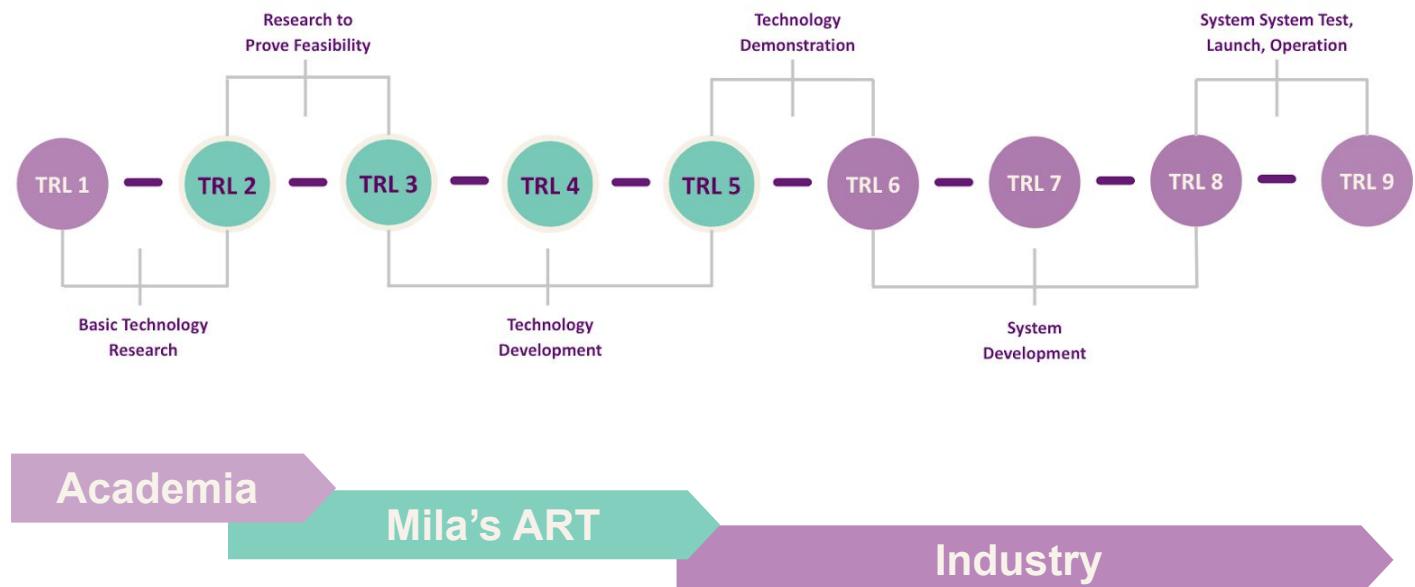
The Applied AI Team's Positioning

The **Applied Research Team** (ART) **collaborates with companies** on projects of TRL 2-4, that typically span a timeline of **6-18 months**. If needed, the team will help the company advance the project to TRL 5

The team rigorously follows **best practices** in terms of software development and **production-grade tools**

The team is used to working with '**real and dirty**' **data** to deliver high-quality work to companies

Team Positioning on the Technology Readiness Level Scale¹





Applied Project Breakdown

Steps

A Initial project discussion (free)

- ~2-3 meetings that typically span over 2-3 weeks

B Project evaluation

- ~4-8 weeks depending on the data and the complexity of the project

C Proof of concept

- ~6-18 months depending on the scope of work

Timeline

Activities

Output

- Mila's Applied AI Team meets with the industrial partner to evaluate at a high level the algorithmic potential of the problem and the available data

- Mila does more in-depth work to evaluate the feasibility of the project based on the available data
- Mila does a literature review and defines an experimental protocol for the proof of concept

- Mila submits a more elaborate statement of work (SoW) to the industrial partner
- Mila proceeds with the hands-on applied ML research project, in close collaboration with the industrial partner

- Recommendation on what the next steps of the project should be
- Proposal for project evaluation (if relevant)

- Detailed report including database analysis/audit and literature review
- Experimental protocol (if there is a recommendation to move forward with the project)

- Detailed report including methodology, experimental results and observations
- Trained model
- Code



Case Studies

Dialogue

Organization:

Dialogue is a virtual healthcare services provider offering a telemedicine platform to match users to the right healthcare practitioner

Collaboration project:

Design a scalable and easy-to-maintain Q&A machine learning based solution to identify the pathology a patient is suffering from and collect all relevant findings

**Organization:**

Hydro-Québec (HQ) is a world-renowned power utility with deep expertise in high voltage testing, mechanics and network simulations and calibration

Collaboration project:

Understand how deep learning can help predict solar irradiance for the next 6 hours (a.k.a. “solar irradiance nowcasting”) in Québec and the US east coast



Natural Resources
Canada Ressources naturelles
Canada

**Organization:**

The Geological Survey of Canada (GSC) is a scientific agency within the Lands and Minerals sector of Natural Resources Canada

Collaboration project:

Explore the application of machine learning to help predict rock types and the presence of mineralization from seismic data where there is no drilling information



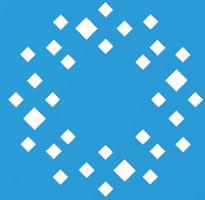
GET IN TOUCH



Alexia Corcoran
Advisor, Partnerships

alexia.corcoran@mila.quebec

IVADO



Upcoming IVADO Training



June 2021

5th Edition
Fin-ML (Manuel Morales)



Summer 2021

3rd Edition
Polytechnique Montréal (Thomas Hurtut)



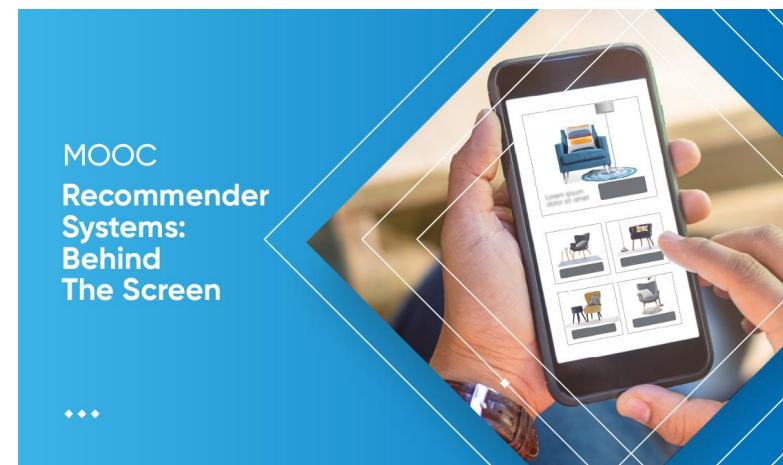
Fall 2021

2nd Edition
Consortium NLP



Fall 2021

1st Edition
CIRRELT, GERAD



Collaboration
Laurent Charlin,
HEC, Mila



CANADA
FIRST
RESEARCH
EXCELLENCE
FUND

APOGÉE
CANADA
FONDS
D'EXCELLENCE
EN RECHERCHE



Québec Canada