Maxime Wabartha

maxime.wabartha@mail.mcgill.ca,
maxwab.github.io

RESEARCH INTERESTS

I am interested in designing more transparent machine learning models to improve their interpretability.

EDUCATION

PhD in Computer Science, McGill University (Canada), 2019 - to date
Interpretability and reinforcement learning, advised by Prof. Joelle Pineau

MSc in Applied Mathematics, Université Paris-Saclay (France), 2017 - 2018
Master "Mathématiques, Vision, Apprentissage" (MVA). Topic: *Learning diverse neural networks for improved exploration in deep reinforcement learning*

MEng, École Centrale de Lille (France), 2010 - 2017

EXPERIENCE

Visiting researcher, FAIR, Meta (Canada), Sep. 2022 - Sep. 2023
Topic: *Interpretability and deep reinforcement learning* [1]

Research intern, McGill University (Canada), May 2018 - Dec. 2018
Topic: *Exploration in deep reinforcement learning* [5]

Research intern, Polytechnique Montréal (Canada), May 2017 - Sep. 2017
Topic: *Semantic segmentation of the spinal cord* [6]

Business intelligence analyst, Shopwings (Australia), Jun. 2016 - Sep. 2016
Startup. Developing data analysis tools, project manager.

Junior financial auditor, Ernst&Young (France) Sep 2015 - Mar. 2016
Financial audit of industrial french companies.

Internal vice-president, Centrale Lille Projets (France). Apr. 2014 - Mar. 2015
Student-led consulting company (100k€ turn-over).
In charge of HR, project manager for 5 projects (∼15k€).

References available upon request

PUBLICATIONS

[1] **Wabartha, M.** & Pineau, J. (2024). *Piecewise Linear Parametrization of Policies for Interpretable Deep Reinforcement Learning. (To appear in)maximewabartha* International Conference on Learning Representations.

[2] **Wabartha, M.**, Durand, A., Francois-Lavet, V., & Pineau, J. (2020). *Handling Black Swan Events in Deep Learning with Diversely Extrapolated Neural Networks.* International Joint Conference on Artificial Intelligence, 2140-2147.

[3] Mangeat, G., Ouellette, R., **Wabartha, M.**, De Leener, B., Plattén, M., Danylaité Karrenbauer, V., ... & Granberg, T. (2020). *Machine Learning and Multiparametric Brain MRI to Differentiate Hereditary Diffuse Leukodystrophy with Spheroids from Multiple Sclerosis.* Journal of Neuroimaging.

[4] **Wabartha, M.**, Durand, A., François-Lavet, V., & Pineau, J. (2019). *Handling Black Swan Events in Deep Learning with Diversely Extrapolated Neural Networks.* NeurIPS Workshop on Safety and Robustness in Decision Making.

[5] **Wabartha, M.**, Durand, A., François-Lavet, V., & Pineau, J. (2018). *Sampling diverse neural networks for exploration in reinforcement learning.* NeurIPS Workshop on Bayesian Deep Learning.

[6] Zaimi, A.*, **Wabartha, M.***, Herman, V., Antonsanti, P. L., Perone, C. S., & Cohen-Adad, J. (2018). *AxonDeepSeg: automatic axon and myelin segmentation [...] using convolutional neural networks.* Nature Scientific reports, 8(1), 1-11.

[*] denotes an equal contribution.

SKILLS

Programming: Python, Pytorch, TensorFlow, R

Software/OS: Git, Unix, Slurm, LaTeX, Matlab, Singularity

Math: experience with Markov chains, calculus, probability, linear algebra

AWARDS

FRQNT scholarship, doctoral program 2021-2024
Fond de Recherche du Québec - Nature et Technologies.
Competitive provincial scholarship, 25% acceptance.

SELECTED TALKS

Improving the transparency of predictive models in the era of neural networks

- PhD proposal exam, McGill Sep. 2023

Piecewise-linear parametrization of policies: towards interpretable deep reinforcement learning

- RL Sofa reading group, Mila Oct. 2023
- Research seminar, FAIR (Meta Montreal) Sep. 2023
- Invited talk, EQUAL lab Aug. 2023

Handling Black Swan Events in Deep Learning with Diversely Extrapolated Neural Networks [2]

- IJCAI '20, online Jan. 2021

Using diverse ensembles for out-of-distribution detection [4]

- Invited talk, NeuroPoly lab (Canada) Jun. 2019

TEACHING

Teaching assistant, McGill University (Canada) Jan. 2020 - Apr. 2020
Artificial Intelligence (COMP424, 90h).
Office hours, tutorials, invigilating, grading.

SERVICE

Reviewer: Reproducibility Challenge ('19, '20, '21 (Outstanding reviewer), '22), Montreal AI Symposium ('20), ECML ('22).

Volunteer helping with the organization of the RLDM conference in Montreal ('20).

LANGUAGES

French (native), English (fluent), Italian (conversational), German (conversational).

EXTRA-CURRICULAR

Practice of competitive badminton, 10 years