Maxime Wabartha

Montréal, QC, Canada
(+1) 438 824 0908
maximewabartha@gmail.com
https://maxwab.github.io

Research interests

Uncertainty in reinforcement learning; applications of deep learning to reinforcement learning.

Education

2019 – to date **Ph.D. in Computer Science**, *McGill University, Mila*, Canada.

Uncertainty in reinforcement learning

I focus on the problem of using different measures of uncertainty on reinforcement learning models to perform directed exploration. I believe that understanding better how neural networks behave out-of-distribution can help address this issue.

As part of my PhD, I have taken classes in reinforcement learning and probabilistic analysis of algorithms. My PhD is supervised by Prof. Joelle Pineau.

2017 – 2018 **M.Sc. in Applied Mathematics**, *École Normale Supérieure Paris-Saclay*, France.

Mathematics, computer vision and machine learning.

Master program "MVA", considered the best machine learning master in France.

Reinforcement learning, probabilistic graphical models, graphs (project: graph exploration using Thompson Sampling), kernel methods, computer vision (project: segmentation with atrous convolutions)

2013 – 2017 **M.Eng.**, *École Centrale de Lille*, France.

Data Science major – Entrepreneurship minor

Top 10 french engineering schools program

- Specialization in machine learning, statistical estimation, reinforcement learning,
- Solid foundations in engineering (mechanics, electronics, embedded systems) and business (strategy, change management, assertivity),
- Extra-curricular: Co-founder of the school's movie club.

2010 – 2013 **Mathematics & Physics student**, *Lycée Kléber*, France.

Intensive preparatory classes for competitive entrance to the french "Grandes Écoles".

Professional experience

May 2018 to Dec. 2018 **Research intern in reinforcement learning**, *Reasoning and Learning Lab, Mila*, McGill University, Canada.

Study of methods to train deep learning models with uncertainty. Development of a model-based approach leveraging uncertainty to solve a low-dimensional RL problem. Supervised by Audrey Durand, Vincent François-Lavet and Joelle Pineau.

May 2017 to Sep. 2017 **Research intern in computer vision and deep learning**, *NeuroPoly (neuroimaging laboratory)*, Polytechnique Montréal, Canada.

Development of AxonDeepSeg, a CNN using a variation of the U-net architecture to segment microstructures from spinal cord microscopy data. Open-source software (TensorFlow) available online. Lead co-author of a scientific article published in Nature Scientific Reports.

Apr. 2016 to Aug. 2016 **Business Intelligence analyst**, *Shopwings (startup)*, Canada.

Uber-like start-up delivering supermarket groceries directly to the customers' doorstep.

Responsible of extending the operations and data analysis tools during a business expansion period (launch of the service in 3 new cities). In charge of the technical and organizational implementation (solution's choice, coding, processes update, change management) of 2 strategic partnerships.

Apr. 2014 to Mar. 2015 **Internal vice-president**, *Centrale Lille Projets, €100k-turnover consulting firm*, France.

Student-managed consulting firm providing programming and marketing services.

In charge of the objectives and strategy of each division alongside their respective supervisors. Project manager for 5 projects (€15k) with entrepreneurs and industry leaders: business meetings, contract redaction.

References available upon request.

Teaching experience

2020 – 2020 **Teaching assistant**, *McGill University*, Canada.
90 hours per semester. Class on Artificial Intelligence (COMP424). Included giving office hours, tutorials, invigilating and grading.

Talks given

Invited talk at the NeuroPoly lab to present my work on using diverse ensembles for out-of-distribution detection, *June 2019*

Publications

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

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.

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.

* denotes an equal contribution.

Languages

English Fluent written and oral (TOEFL: 111/120, TOEIC: 985/990).
German Occasional practice, B1-level equivalent.
Italian Basic.

Skills

Programming Python, Pytorch, TensorFlow, C, SQL, Google Apps Script
Softwares/OS Git, Unix, Slurm, LaTeX, Matlab

Extracurricular activities

Sport Practice of competitive badminton for 10 years
Misc. interests Business - Technology - Cinema