Tom Marty

3rdcore.github.io tom.marty@mila.quebec Google Scholar

Education

Ph.D. in Machine Learning Jan. 2024 – Mar. 2026
Mila, Université de Montréal - GPA 4.00 (Leave of absence) *Montréal, Canada*

M.Sc. in Machine Learning Sep. 2021 – Aug. 2023
Polytechnique Montréal - GPA 3.91 *Montréal, Canada*

B.Sc. in Applied Mathematics Sep. 2018 – Aug. 2021
***X 2018**, Ecole Polytechnique - GPA 3.84* *Palaiseau, France*

Advanced Preparatory Class for Competitive Exams Sep. 2016 – Aug. 2018
Lycée Jean-Baptiste Say - GPA 4.00 - Top 0.1% national *Paris, France*

Research Interest

- **Broad interest** : Deep Learning, Generative Modeling, AI for Science, Information Theory
- **Methodological interest** : Large-Scale Training, Diffusion model, Entropic compression
- **Applications** : ML for computational biology, Robust Machine Learning, open-ended Decision Making

Industry and Academic Experience

Visiting Researcher Apr. 2023 – Sep. 2023
ServiceNow Research *Montréal, Canada*
- Developped WorkArena: an open-source Gym environment for evaluating Agent at solving common-knowledge tasks on a Web Browser

Research Coordinator Jan. 2022 – Sep. 2022
Corail Research Group *Montréal, Canada*
- Supervised five interns on the development of the open-source project SeaPearl (30K lines of code)

Research Engineer Intern Jan. 2021 – Sep. 2021
Corail Research Group *Montréal, Canada*
- Developped SeaPearl : an open-source Constraint Programming solver with RL-based heuristics
- Used Deep Q-networks and Heterogeneous GNNs to approximate optimal branching decision

Software Engineer Intern Jun. 2020 – Sep. 2020
Dronisos, The drone light show company *Bordeaux, France*
- Developed *Harmony*, a physics based meta-heuristic that secures massive 1000 drones swarms
- *Harmony* reduced the allocated securing time in production from 2 weeks (handmade) to 0.2 seconds
- Achieved automatic securing on the company first 1000 drones choreography (+500k$ show)

Conference and Journal Publications

A Compression Perspective on Simplicity Bias
Tom Marty*, Eric Elmoznino, Tejas Kasetty, Léo Gagnon, Mizu Nishikawa-Toomey, Sarthak Mittal, Guillaume Lajoie, Dhanya Sridhar
*under review Code PDF

In-Context Learning and Occam's Razor
Eric Elmoznino*, **Tom Marty***,Tejas Kasetty, Leo Gagnon, Sarthak Mittal, Mahan Fathi, Dhanya Sridhar, Guillaume Lajoie
International Conference on Machine Learning (ICML 2025) Code PDF

Does Learning the Right Latent Variables Necessarily Improve In-Context Learning?
Sarthak Mittal, Eric Elmoznino, Leo Gagnon, Sangnie Bhardwaj, **Tom Marty**, Dhanya Sridhar, Guillaume Lajoie
International Conference on Machine Learning (ICML 2025) PDF

Next-Token Prediction Should be Ambiguity-Sensitive: A Meta-Learning Perspective
Leo Gagnon, Eric Elmoznino, Sarthak Mittal, **Tom Marty**, Tejas Kasetty, Dhanya Sridhar, Guillaume Lajoie
International Conference on Machine Learning (FoMo@ICML 2025) PDF

The BrowserGym Ecosystem for Web Agent Research
Thibault Le Sellier De Chezelles, Maxime Gasse, Alexandre Drouin, Massimo Caccia, Léo Boisvert, Megh Thakkar, **Tom Marty**, Rim Assouel, Sahar Omidi Shayegan, Lawrence Keunho Jang, Xing Han Lù, Ori Yoran, Dehan Kong, Frank F. Xu, Siva Reddy, Quentin Cappart, Graham Neubig, Ruslan Salakhutdinov, Nicolas Chapados, Alexandre Lacoste
Transactions on Machine Learning Research (TMLR 2025) . Code PDF

WorkArena: How Capable Are Web Agents at Solving Common Knowledge Work Tasks?
Alexandre Drouin, Maxime Gasse, Massimo Caccia, Issam H Laradji, Manuel Del Verne, **Tom Marty**, Léo Boisvert, Megh Thakkar, Quentin Cappart, David Vazquez, Nicolas Chapados, Alexandre Lacoste
International Conference on Machine Learning (ICML 2024) . Code PDF

The Unsolved Challenges of LLMs as Generalist Web Agents: A Case Study
Rim Assouel*, **Tom Marty***, Massimo Caccia, Issam H. Laradji, Alexandre Drouin, Sai Rajeswar, Hector Palacios, Quentin Cappart, David Vazquez, Nicolas Chapados, Maxime Gasse, Alexandre Lacoste
Neural Information Processing Systems (FMDM@NeurIPS 2024) . Code PDF

Learning and Fine-Tuning a Generic Value-Selection Heuristic Inside a Constraint Programming Solver
Tom Marty*, Léo Bois-Vert*, Tristan François, Pierre Tessier, Louis Gautier, Léo-Boisvert, Louis-Martin Rousseau, Quentin Cappart, Constraint **Journal** 2024. Code PDF

Learning a Generic Value-Selection Heuristic Inside a Constraint Programming Solver
Tom Marty*, Tristan François, Pierre Tessier, Louis Gautier, Louis-Martin Rousseau, Quentin Cappart
Distinguished paper, Constraint Programming (CP 2023). Code PDF

You can also find the most up-to-date publications on my Google Scholar page.

Other Projects

Discrete flow matching for protein co-design aimed at pMHC:TCR binding *Ongoing Research*
- Engineered a large-scale distributed training pipeline to train a sequence-structure co-design generative model over 200 million protein sequences and 100000 3D structures

Dissection of concept acquisition in protein Language Model *Ongoing Research*
- Curated datasets to evaluate the model's acquisition of known biochemical and structural concepts.

Autonomous Drone Swarm Deployment - DGA contest | *Python, PyTorch* Nov. 2020 – Mar. 2021
- Multi-agent Q-Learning method for deployment optimization
- Density-Based Spatial Clustering for point of interest detection

Realtime 3D Deep Motion Capture | *C++, OpenCV, PyTorch* Oct. 2020 – Dec. 2020

- Implemented a method of inferring a full character's 3d pose using only a camera as an input
- Inspired by a EECV 2020 research paper to implement the algorithm

Sketch-based Shape Retrieval | *Python, C++, OpenGL* Sep. 2020 – Dec. 2020

- Implemented a method to find any specific 3d model in a database using a drawing as an input
- Succeeded to faithfully retrieve several simple 3D shapes by using a single drawing given by a user

Visit 🔗 my website to know more about me and my projects!

Honors and Awards

FRQNT doctoral training scholarship: 100000$ Mar. 2025
Distinguished Paper Award at CP conference Sep. 2023
MITACS Accelerate scholarship: 30000$ Mar. 2023
Oustanding Investment Mention, Ecole Polytechnique Jul. 2022
Vallet Fondation scholarship: 10000€ Sep. 2018

Teaching Experience

Teaching Assistant Fall 2025
IFT6390: Fundamentals of machine learning
Teaching Assistant Fall 2022
INF8215, Artificial Intelligence : Algorithms and methods
Teaching Assistant Fall 2021
INF8215, Artificial Intelligence : Algorithms and methods
Teaching Assistant Fall 2018 – Winter 2019
Ministry of National Education

- Responsible for a group of up to 20 undergraduate students during scientific workshops
- Worked alongside the academic team to prepare students for entrance exams

Community Involvement and Service

Tea Talks Committee Member – Research Seminar held at Mila 2025
Reviewer for NeurIPS 2025 NewInML Workshop 2025
Reviewer for NeurIPS 2024 CALM Workshop, MAIS 2024, HRAIM 2024 2024
Reviewer for CP2023 2023
President of Nuit du Styx festival 2020

- Reponsible of the organization of an electronic music festival gathering more than 2000 persons

Member of Rethorix, Public Speaking Club 2019

Skills & Hobbies

Languages: French : Native | English : Fluent
Developer Toolbox: Pytorch, Lightning, Git, Hydra, WandB, SLURM, HPC, CI Testing
Programming Languages: Python, Julia, C++, R

Activities: Outdoor climbing, Surfing, Snowboarding, mountain hiking, UAV robotics

Reference

Prof. Dhanya Sridhar (Ph.D. advisor)
Assistant Professor at UdeM, Core academic member at MILA - AI CIFAR Chair holder
Email : dhanya.sridhar@mila.quebec

Dr. Alexandre Lacoste
Staff Research Engineer, ServiceNow Research
Email : alexandre.lacoste@servicenow.com

Prof. Quentin Cappart (M.Sc. advisor)
Assistant Professor at Polytechnique Montréal
Email : quentin.cappart@polymtl.ca