


Tom Marty

 3rdcore.github.io
 Github

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 LinkedIn

Montreal, Canada
 Twitter

EDUCATION

MILA - Montréal Institute of Learning Algorithms

Ph.D. in Machine Learning

Jan. 2024 –

Montréal, Canada

- **Courses :** Causal Inference (Dhanya Sridhar)

Polytechnique Montréal

M.Sc. in Operationnal Research - GPA 3.91

Sep. 2021 – Jun. 2023

Montréal, Canada

- **Courses :** Représentation Learning (Aaron Courville) | Spectral Graph Theory (Guy Wolf) | Continual Learning (Irina Rish)

Ecole Polytechnique - X 2018

Bachelor Of Science in Computer Science, Minor in Applied Mathematics - GPA 3.84

Sep. 2018 – Jun. 2021

Palaiseau, France

- **Theoretical Computer Science :** Graph Theory | Computational Geometry | Advanced Algorithmic
- **Applied Mathematics :** Optimisation | Statistical modeling | Deep Learning
- **Computer Graphics :** Computer Vision | Image Processing and Rendering

Lycée Jean-Baptiste Say

"Classe préparatoire" Intensive multi-disciplinary program leading to entrance exams - GPA 4.00

Sep. 2016 – Jun. 2018

Paris, France

INDUSTRY AND ACADEMIC EXPERIENCE

Visiting Researcher

ServiceNow Research

Apr. 2023 – Sept. 2023

Montréal, Canada

- Developed WorkArena : an open-source Benchmark and Gym environment for evaluating Agent at solving common-knowledge tasks on a Web Browser

Research Supervisor

Corail Research Group

Jan. 2022 – Sept. 2022

Montréal, Canada

- Supervised five interns on the development of the open-source project SeaPearl
- Teaching Assistant for the course INF8215 given by Quentin Cappart in Fall 21 and Fall 22

Research Engineer Intern

Corail Research Group

Jan. 2021 – Sept. 2021

Montréal, Canada

- Developed *SeaPearl* : an open-source RL-driven generic Constraint Programming solver
- Used Deep Q-networks and Heterogeneous GNNs to approximate optimal decision process

Software Engineer Intern

Dronisos, drone light show company

Jun. 2020 – Sept. 2020

Bordeaux, France

- Developed *Harmony*, a Physics based meta-heuristic that secures massive drone swarms
- *Harmony* - currently in use - reduced the allocated securing time from 2 weeks (handmade) to 2 seconds
- Achieved automatic securing on the company first 1000 drones choreography (+500k\$ show)

PUBLICATIONS

Learning a Generic Value-Selection Heuristic Inside a Constraint Programming Solver

Tom Marty*, Tristan François, Pierre Tessier, Louis Gautier, Léo-Boisvert, Louis-Martin Rousseau, Quentin Cappart, (extended version)

Constraint Journal

**under review*

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.

[🔗 Project](#) [📄 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

Foundation Models for Decision Making Workshop (NeurIPS). 2023.

[📄 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

Constraint Programming (CP). 2023.

[📄 Code](#) [📄 PDF](#)

OTHER PROJECTS

Leveraging Information Theory to create better optimizers | *Python*

May. 2024 –

- Work in progress...

On the necessity of human insight to improve natural adversarial robustness

Mar. 2024 –

- Work in progress...

WorkArena : an Open-Source Benchmark for evaluating Web Agents | *Python*

Apr. 2023 – Mar. 2024

- Paper accepted at ICML 2024, Vienna

SeaPearl : an Open-Source RL-driven Constraint-Programming Solver | *Julia*

Fev. 2021 – Jul. 2023

- Paper accepted at CP2023, Toronto

Adversarial Attacks on Sentiment Classification models | *Python, HuggingFace*

Fev. 2022 – May. 2022

- Adversarial fine-tuning on large NLP models : Eleuther AI GPT 125M/1.3B/2.7B/6B parameters
- Evidence of a correlation between scaling and robustness against increasingly subtle Adversarial Attacks

Diffusion Geodesic distance for non-linear dimensionality reduction | *Python*

Oct. 2021 – Jan. 2022

- Approximated the geodesic distance using a diffusion process over the manifold
- Proposed a new data visualization algorithm based on Multi-Dimentionnal Scaling and Diffusion Geodesic

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

HONORS AND AWARDS

Distinguished Paper Award at CP2023, Toronto	Sept. 2023
MITACS Accelerate scholarship of two units for my internship at ServiceNow Research	Mar. 2023
Oustanding Investment Mention, Ecole Polytechnique de Paris	Jul. 2022
Vallet Fondation scholarships for outstanding CPGE students	2018

TEACHING EXPERIENCE

Teaching Assistant <i>INF8215, Artificial Intelligence : Algorithms and methods</i>	Fall 2022
Teaching Assistant <i>INF8215, Artificial Intelligence : Algorithms and methods</i>	Fall 2021
Teaching Assistant <i>Ministry of National Education</i>	Nov. 2018 – Mar. 2019 <i>France</i>
<ul style="list-style-type: none">• Responsible for a group of up to 20 undergraduate students during scientific workshops• Worked alongside the academic team to prepare students for entrance exams	

STUDENT ASSOCIATION

Public Speaking Club: Rethorix <ul style="list-style-type: none">• Organization of an eloquence contest between the schools of the Plateau de Saclay	Oct. 2019 – Oct. 2020
President of Nuit du Styx <ul style="list-style-type: none">• General organization and logistic of an electronic music festival gathering more than 2000 peoples	Nov. 2020

SKILLS & HOBBIES

Languages: French : Native | English : Fluent | Russian : Primary
Programming Languages: Python, Julia, C++, R
Developer Toolbox: Git, Pytorch, Lightning, Hydra, WandB, VScode, SLURM, CI testing
Remote Controlled UAV: Conception, Building, Programmation, Testing, Adjustment
Activities: Outdoor climbing, river surf, ski, montain hiking

REFERENCE

Prof. Dhanya Sridhar (Ph.D. advisor)
Core academic member of 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