

# Tom Marty

<https://3rdcore.github.io> | [tom.marty@mila.quebec](mailto:tom.marty@mila.quebec) | Montreal, Canada

## EDUCATION

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### 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 Operational Research - GPA 3.91*

Sep. 2021 – Jun. 2023

Montréal, Canada

- **Courses :** Représentation Learning (Aaron Courville) | Spectral Graph Theory (Guy Wolf) | Continual Learning (Irina Rish)
- **SeaPearl (Thesis) - Supervised by Quentin Cappart and Louis-Martin Rousseau:** Using RL and Graph Representation Learning to accelerate discrete optimization problem solving process - paper accepted at **CP 2023**

### 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

## EXPERIENCE

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### Visiting Researcher

*ServiceNow Research*

Apr. 2023 – Sept. 2023

Montréal, Canada

- Developed WebArena : an open-source Benchmark and Gym environment for evaluating Agent at solving tasks on a Web Browser
- Workshop paper accepted at NeurIPS 2023 FMDM Workshop. One paper under review at ICML 2024.

### 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 ( NP-Complete )
- *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)

### Teaching Assistant

*Ministry of National Education*

Nov. 2018 – Mar. 2019

Noyon, France

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

## PROJECTS

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- WebArena : an Open-Source Benchmark for evaluating Web Agents** | *Python* Apr. 2023 – Sept. 2023
- Workshop paper accepted at NeurIPS 2023 FMDM Workshop, New Orleans
  - Paper under review at ICML 2024
- SeaPearl : an Open-Source RL-driven Constraint-Programming Solver** | *Julia* Feb. 2021 – Jul. 2023
- Paper accepted at CP2023, Toronto
  - Visit this link for detailed explanations
- Adversarial Attacks on Sentiment Classification models** | *Python, HuggingFace* Feb. 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
  - Project coordinated by Irina Rish, AI CIFAR Chair holder, MILA
- 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-Dimensionnal 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
  - Used 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

## STUDENT ASSOCIATION

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- Public Speaking Club: Rethorix** Oct. 2019 – Oct. 2020
- Organization of an eloquence contest between the schools of the Plateau de Saclay
- President of Nuit du Styx** Nov. 2020
- General organization and logistic of an electronic music festival gathering more than 2000 peoples

## SKILLS & HOBBIES

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**Languages:** French : Native | English : Fluent | Russian : Primary  
**Programming Languages:** Python, Julia, C++, R  
**Developer Tools:** Git, SLURM, Pytorch, Lightning, Hydra, SCRUM, VScode, Pytest  
**Open-Source web service deployment:** Nextcloud, Nginx, Swag, OpenMediaVault  
**Remote Controlled UAV:** Conception, Building, Programmation, Testing, Adjustment  
**Sports:** Outdoor climbing, River surf, Ski, Mountain hiking