

Nicolas Castanet

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PhD in Reinforcement Learning

Education

Ph.D. in Reinforcement Learning, ISIR, Sorbonne Université 10/2021-01/2025

Supervisors: Olivier Sigaud (MLIA, Sorbonne Université) and Sylvain Lamprier (LERIA, Université d'Angers, ex MLIA Sorbonne Université)

Title: Automatic state representation and goal selection in unsupervised reinforcement learning.

- Published two papers as first author, one of them in ICML, a major international machine learning conference, the other paper is currently under review.
- Worked on Goal Conditioned Reinforcement Learning from the unsupervised framework, involving intrinsic motivation to automatically generate a curriculum of goals.
- Worked on image-based Reinforcement Learning and Representation Learning strategy such image reconstruction (e.g VAE).
- Implemented RL algorithms/environments using xpag ("exploring agents"), a modular reinforcement learning library with JAX agents along side the Mujoco advanced physics simulator.
- Used the public HPC cluster Jean Zay to conduct experiments.
- Worked simultaneously as a teacher in Sorbonne University for computer science / machine learning majors from 1st year bachelor up to last year's master's degree.

Master in Computer Science, Sorbonne Université 2019-2021

"Données, Apprentissage et Connaissances" (DAC)

Data acquisition and processing, Machine learning, Deep learning.

Bachelor in Computer Science, Sorbonne Université 2018-2019

Engineering school, INP ENSEEIHT (Toulouse) 2016-2018

Electrical and Automatic Engineering.

Maths preparatory classes - MPSI/PSI, Lycée Sainte-Marie (Paris) 2014-2016

Publications

Nicolas Castanet, Olivier Sigaud, and Sylvain Lamprier. Imagine Beyond! Distributionally Robust Auto-Encoding for State Space Coverage in Online Reinforcement Learning. (2025) <https://arxiv.org/abs/2505.17830>

Nicolas Castanet, Olivier Sigaud, and Sylvain Lamprier. Stein variational goal generation for adaptive exploration in multi-goal reinforcement learning. (ICML 2023) <https://proceedings.mlr.press/v202/castanet23a.html>

Teaching

Reinforcement Learning and advanced Deep Learning	2024-2025
2nd year Master DAC, Sorbonne Université	
Python introduction	2023-2024, 2024-2025
1st year Bachelor, Sorbonne Université	
Python game development project, development of simple IA agents	2022-2023
2nd year Bachelor, Sorbonne Université	
Business Intelligence and User Modeling	2022-2023
1st year Master DAC, Sorbonne Université	

Internships

Deep RL/Curriculum Learning - Research internship (M2), LIP6	03/2021-09/2021
Under the direction of Sylvain Lamprier (MLIA) and Oliver Sigaud (ISIR). Automatic Curriculum Learning (ACL) for Deep Reinforcement Learning (DRL). These methods are applied in the context of sparse or absent reward signal. Research axes :	
○ Off Policy RL and Relabeling (Hindsight Experience Replay).	
○ Exploration (Intrinsic motivation, Curiosity ...).	
○ Automatic Goal Generation, Self-Play.	
Gesture classification - Research internship (M1), LIP6	06/2020-09/2020
Under the direction of Olivier Schwander, Associate professor in the MLIA team. Classification of gesture detected by radar micro Doppler Soli :	
○ Deep learning for time-space data.	
○ Signal representation with Riemannian geometry.	

Technical skills

- **Computer Science** : Statistical learning, Deep learning, Reinforcement learning.
- **Applied mathematics** : Statistics, Probabilities, Optimization, Differential Geometry.
- **Programming languages & Technologies** : Python (NumPy, Pandas, Scikit-Learn, PyTorch, Tensorflow, JAX), Java, Javascript, LaTeX, Git, Mujoco physical simulator.
- **Working environment** : Linux + Git + VS Code & GitHub Copilot.

Miscellaneous

Languages

- French : native.
- English : fluent.
- Italian : Beginner

Hobbies

- Trail, running, cycling, climbing, bikepacking.
- 3D printing & robotics.
- Trips : Iceland, Norway, Scotland, England, Italy.

Tutoring in Mathematics / Physics (Bachelor and high school students)	2015-2019
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