Théo CACHET

"With reinforcement learning, your agents do not learn, you do."

🔬 Research Scientist | VLM | VLA | Simulation | Robotics
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🖥️ **Latest Project:** Robostral Navigate – Mistral AI

RESEARCH EXPERIENCE

Research Scientist, Mistral AI, Paris *(2025–Now)*

- Lead the research & development of **Robostral Navigate**, a SoTA navigation system deployed on real robots across diverse embodiments (Blog Post, Technical Report, Demo Video).
- Work across the full stack: model architecture, synthetic data generation pipelines, evaluation suites, and deployment on the robots.
- Work on VLA architectures and synthetic training data.

Research Scientist, NAVER LABS Europe, Grenoble *(2024–2025)*

- Developed a new, retrieval-based approach for language-conditioned control policies (Text2Control – Naver Labs) for humanoids, achieving SoTA generalization to previously unseen instructions.
- Worked on RL and meta-learning of demonstration-conditioned manipulation policies for few-shot imitation, leading to SoTA generalization to previously unseen tasks on MetaWorld.
- Worked on RL (AlphaZero, PPO) for combinatorial optimization (TSP, knapsack) and robot fleet management.

Research Intern, Walnut Algorithms, Paris *(June–Dec 2019)*

- Research on machine learning methods for algorithmic trading.
- Developed a strategy deployed with $50M capital allocation.

Research Intern, INRIA / LJK, Grenoble *(June–Sept 2018)*

- Integrated eye-tracking data into a computational model of human memory during reading tasks.

EDUCATION

PhD, Sorbonne University & NAVER LABS Europe *(2021–2024)*

- Thesis: *"Task specification and generalization in multitask reinforcement learning"* supervised by Christopher R. Dance and Olivier Sigaud.
- **Key Contributions:**
  - Developed VLM-based RL training-task generation methods.
  - Created a method outperforming VLAs in generalization to previously unseen instructions for humanoid robots.
  - Introduced a method to build demonstration-conditioned manipulation policies with state-of-the-art generalization to novel tasks.

M.Sc. in Artificial Intelligence, Imperial College London *(2018–2019)*

- Focus on reinforcement learning, mathematics of deep learning, and robotics.

M.Sc. in Computer Science, ENSIMAG, Grenoble INP *(2016–2019)*

- Focus on machine learning, multi-agent systems, compilers, probability & algebra.

Preparatory Classes, Grenoble INP *(2014–2016)*

- Intensive two-year program in mathematics and physics, preparing for entrance in the French “Grandes Écoles”.

PUBLICATIONS & PATENTS

- **Robostral Navigate: Vision-Language Navigation via Dual System Architecture**
  T. Cachet et al. – Technical Report (arXiv:2607.20785), 2026
  A vision-language navigation dual system deployed on real robots across diverse embodiments, achieving SoTA performance on R2R and RXR benchmarks.
- **From Goal-Conditioned to Language-Conditioned Agents via Vision-Language Models**
  T. Cachet, C. Dance, O. Sigaud – ICML 2024
  Connecting simulator state representations with natural language using rendering functions and VLMs to build zero-shot language-conditioned agents.
- **Demonstration-Conditioned Reinforcement Learning for Few-Shot Imitation**
  T. Cachet, C. Dance, J. Perez – ICML 2021
  A demonstration-conditioned RL method resulting in state-of-the-art few-shot imitation.
- **Transformer-Based Meta-Imitation Learning for Robotic Manipulation**
  J. Perez, S. Kim, **T. Cachet** – NeurIPS Workshop 2020
  Applies transformers to meta-imitation learning for robotic tasks.

TECHNICAL SKILLS

- **Core Domains:** VLMs, VLAs, Reinforcement Learning, Meta-Learning, Multimodal Learning, Simulation, Robotics.
- **Languages & Tools:** Python, PyTorch, Isaac, MuJoCo, ROS, Slurm, Kubernetes (k8s), Buildkite, MyPy, Ruff, Git.
- **Languages:** Native French, Fluent English.

ACHIEVEMENTS & INTERESTS

- **Competitive Programming:** 2nd place out of 646 in Lux AI (Kaggle competition; $3,500 prize) with an RL-only approach. Participated multiple times in Two Sigma’s AI competition “Halite”.
- **Personal Projects:** Thought-to-action models via EEG data using an OpenBCI headset.
- **Leadership & Teaching:** Certified ski and diving instructor (since 2014).
- **Endurance & Perseverance:** Completed a 5-month, 3,000 km thru-hike (Te Araroa Trail, New Zealand).
- **Creativity:** Experienced saxophonist.