

Matteo Bettini

Researcher in multi-agent learning

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📄 Matteo Bettini
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Interested and experienced in reinforcement learning, multi-robot systems, and graph neural networks

Experience

Work

- 2026–present **Meta, Superintelligence Labs, Research Scientist**, Paris, France
Working on agentic large language models
- May–Nov 2025 **Meta, Superintelligence Labs, Research Scientist Intern (PhD)**, Paris, France
Working in the Meta Agents team on online RL training of agentic LLMs. Published the ARE agentic benchmark [8]
○ Researched **training recipes** for long-horizon tasks with tools and sparse rewards (e.g. deep research, smartphone use)
○ Built distributed training pipelines for **70B models on large-scale GPU clusters**, focusing on efficiency and parallelism
- Jun–Oct 2023 **Meta, PyTorch, Machine Learning Engineer Intern (PhD)**, London, UK
Worked in the TorchRL team on PyTorch and facebook-research open-source projects, leading to 2 publications [2, 5]
○ Integrated multi-agent in the PyTorch reinforcement learning library **TorchRL (3.3k+ stars)**, becoming **2nd contributor**
○ Developed and maintained **BenchMARL (558+ stars)**, a facebook-research multi-agent reinforcement learning library
- Jun–Sep 2021 **Amazon, AWS, Software Development Engineer Intern**, Cambridge, UK
Worked in the EC2 team using Rust to implement an interactive serial console for Xen-based EC2 instances
○ Learned and used the **Rust programming language** with cryptographic and asynchronous libraries
○ Implemented an encrypted CoAP client-server and tested on docker, mocking **AWS production environments**

Teaching

- 2021–2025 **University of Cambridge, Guest lecturer, Teaching Assistant, and Supervisor**, Cambridge, UK
○ *Guest lecturer* for the “Computing for Collective Intelligence” course [↗](#), delivering a 1h lecture to master students [▶](#)
○ *Teaching assistant*, demonstrator, and robot manager for “Introduction to Robotics” bachelor and master course [↗](#)
○ *Thesis supervisor* for MPhil students, guiding them in conducting research and producing a master dissertation
○ *Supervisor* and material curator for undergraduate courses, tutoring 19 students in small-sized groups

Organization & Outreach

- 2024–2026 **The Alan Turing Institute, Organizer**, London
○ Organized the UK Multi-Agent Systems Symposium, a day event in King's College (**200 attendees, 10k budget**) [↗](#)
○ Managing the multi-agent systems interest group [↗](#) and mailing list with **650+ participants** [↗](#)
- 2025 **High School Outreach Talk, Invited speaker**, Liceo Scientifico Statale “R. Donatelli - B. Pascal”, Milano
Delivered an AI talk to **120+ students**, sharing industry and academic pathways to support university orientation
- 2024–25 **Lead The Future, Mentor**
Mentored 5 high-achieving STEM Italian students and professionals in a non-profit organization focused on *Give Back* [↗](#)
- 2023, 2024 **Computer Science Open Day, Volunteer**, University of Cambridge, UK
Demonstrated multi-robot reinforcement learning to **100+ kids** of all ages via live and interactive experiments [↗](#)

Education

- Oct 2021 **PhD in Computer Science, University of Cambridge**, UK
- Mar 2025 Thesis: *Neural diversity in multi-agent learning* [↗](#), Supervisor: Prof. Amanda Prorok
○ Published **9 research papers** [?, 1–6, 9, 10] at top conferences (e.g., ICML, ICLR, AAMAS) and journals (JMLR)
○ Focus on studying [4], measuring [3], and controlling [1] behavioral diversity in multi-agent reinforcement learning
○ Created and maintained **VMA5 [6] (516+ stars)**, a vectorized simulator and task collection written in PyTorch
○ Deployed and demonstrated research on a fleet of Cambridge Robomaster autonomous mobile ground robots [10] [↗](#)
- 2020–2021 **MPhil in Advanced Computer Science, University of Cambridge**, UK
Distinction, GPA: 87.09/100, Supervisor: Prof. Amanda Prorok
Thesis on transport network design for multi-agent routing using genetic algorithms and reinforcement learning [↗](#)
- 2017–2020 **BEng in Computer Engineering, Politecnico di Milano**, Italy
110 Cum Laude/110 (Honors), GPA: 29.16/30
Project on software engineering: reinvented board game “Santorini” in Java with online multiplayer and 3D graphics [↗](#)

Awards and recognition

- 2024 Hughes Hall College (University of Cambridge) travel award - 500£
- 2017–2020 Merit-based scholarship at Politecnico di Milano - 50% tuition reduction
- 2017 Best Freshmen of Politecnico di Milano Award - 1500€

Skills

Programming Python, Java, Rust, C, JavaScript, VHDL **Systems** Linux, MacOS, ROS, SLURM, HPC, Docker
AI Libraries PyTorch, scikit-learn, NumPy, SciPy, TorchRL, TorchGeometric, TensorFlow, Pandas, matplotlib

Selected projects

- **BenchMARL**: created the facebook-research BenchMARL library (**558+ stars, 20k+ downloads**) to uniform benchmarking in multi-agent reinforcement learning, published at JMLR, presented at NeurIPS [2] [↗](#)
- **TorchRL**: second contributor of the PyTorch reinforcement learning library (**3.3k+ stars, 2M+ downloads**), spanning multiple domains of data-driven decision-making (model-based/free, LLM RLHF, POMDPs) [5] [↗](#)
- **Vectorized multi-agent simulator (VMAS)**: implemented and maintained VMAS (**516+ stars, 63k+ downloads**), a batched PyTorch multi-agent simulator and task collection for collective learning [6] [↗](#)
- **Multi-robot navigation**: deployed and demonstrated collective learning in a **zero-shot sim-to-real** setting on a fleet of custom Cambridge Robomaster holonomic ground robots equipped with NVIDIA Jetsons [10] [↗](#)

Selected publications

- [1] **Matteo Bettini**, Ryan Kortvelesy, and Amanda Prorok. Controlling Behavioral Diversity in Multi-Agent Reinforcement Learning [↗](#). In *International Conference on Machine Learning (ICML)*, 2024.
- [2] **Matteo Bettini**, Amanda Prorok, and Vincent Moens. BenchMARL: Benchmarking Multi-Agent Reinforcement Learning [↗](#). *Journal of Machine Learning Research (JMLR)*, 25, 2024.
- [3] **Matteo Bettini**, Ajay Shankar, and Amanda Prorok. System Neural Diversity: Measuring Behavioral Heterogeneity in Multi-Agent Learning [↗](#). *Journal of Machine Learning Research (JMLR)*, 26, 2025.
- [4] **Matteo Bettini**, Ajay Shankar, and Amanda Prorok. Heterogeneous Multi-Robot Reinforcement Learning [↗](#). In *Autonomous Agents and Multiagent Systems (AAMAS)*, 2023.
- [5] Albert Bou, **Matteo Bettini**, Sebastian Dittert, Vikash Kumar, Shagun Sodhani, Xiaomeng Yang, Gianni De Fabritiis, and Vincent Moens. TorchRL: A data-driven decision-making library for PyTorch [↗](#). In *International Conference on Learning Representations (ICLR) - Spotlight (top 5%)*, 2024.
- [6] **Matteo Bettini**, Ryan Kortvelesy, Jan Blumenkamp, and Amanda Prorok. VMAS: A Vectorized Multi-Agent Simulator for Collective Robot Learning [↗](#). In *Distributed Autonomous Robotic Systems (DARS)*, 2022.
- [7] **Matteo Bettini***, Michael Amir*, and Amanda Prorok. When is diversity rewarded in cooperative multi-agent learning? [↗](#). In *International Conference on Learning Representations (ICLR)*, 2026. *shared first author.
- [8] **Meta Agents Lab**. Gaia2: Benchmarking llm agents on dynamic and asynchronous environments [↗](#). In *International Conference on Learning Representations (ICLR)*, 2026.
- [9] Steven Morad, Ryan Kortvelesy, **Matteo Bettini**, Stephan Liwicki, and Amanda Prorok. POPGym: Benchmarking Partially Observable Reinforcement Learning [↗](#). In *International Conference on Learning Representations (ICLR)*, 2023.
- [10] Jan Blumenkamp, Ajay Shankar, **Matteo Bettini**, Joshua Bird, and Amanda Prorok. The Cambridge RoboMaster: An Agile Multi-Robot Research Platform [↗](#). In *Distributed Autonomous Robotic Systems (DARS)*, 2024.

Invited talks

Neural Diversity in Multi-Agent Learning

- 2025 ○ Department of Computer and Information Science [↗](#) - *University of Macau*

Controlling Behavioral Diversity in Multi-Agent Reinforcement Learning, [▶](#)

- 2025 ○ Laboratory for Artificial Intelligence and Learning Algorithms [↗](#) - *Università degli Studi di Milano*
2024 ○ Seminar on Combinatorics, Games and Optimisation [↗](#) - *London School of Economics and Political Science*
2024 ○ Artificial Intelligence Research Group Talks (Computer Laboratory) [↗](#) - *University of Cambridge*

BenchMARL: Benchmarking Multi-Agent Reinforcement Learning, [▶](#)

- 2024 ○ Distributed and Collaborative Intelligent Systems and Technology (DCIST) Collaborative Research Alliance (CRA)
2023 ○ InstaDeep knowledge sharing session [↗](#) - *InstaDeep*

Multi-Agent Simulation and Learning in TorchRL, [▶](#)

- 2023 ○ Artificial Intelligence Research Group Talks (Computer Laboratory) [↗](#) - *University of Cambridge*
2023 ○ Multi-agent Reinforcement Learning Reading Group [↗](#) - *University of Maryland, College Park*

Heterogeneous Multi-Robot Reinforcement Learning, [▶](#)

- 2022 ○ Distributed and Collaborative Intelligent Systems and Technology (DCIST) Collaborative Research Alliance (CRA)