

Davide Salaorni | Ph.D. Candidate

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Short Bio

I am a Ph.D. Candidate in Information Technology at the Department of Electronics, Information and Bioengineering (DEIB) of Politecnico di Milano, under the supervision of professors Marcello Restelli and Francesco Trovò. My main research topics revolve around artificial intelligence and machine learning, focusing on online learning and reinforcement learning conceived for real-world domains. I received a Ph.D. scholarship financed by the Italian research center Ricerca sul Sistema Energetico (RSE S.p.A.) to develop digital twins for battery energy storage systems, integrating machine learning methods to empower real-time monitoring and optimal energy management strategies within micro-grids and renewable energy community networks.

Education

PhD in Information Technology

Politecnico di Milano

Supervisors: Marcello Restelli, Francesco Trovò

Thesis:

Milan

Nov 2022 – Today

M.Sc in Computer Science and Engineering

Politecnico di Milano

Supervisors: Stefano Galelli (SUTD), Marcello Restelli (Polimi)

Thesis: Optimal Real-Time Control of Water Distribution Systems undergoing Cyber-Attacks: a Reinforcement Learning Approach.

Milan

Mar 2019 – Dec 2021

B.Sc. in Computer Science and Engineering

Politecnico di Milano

Milan

Sep 2015 – Mar 2019

Job Experience

Ph.D. Researcher

Ricerca sul Sistema Energetico (RSE S.p.A.)

Generation Technologies and Materials (TGM) team - Control of Energy Networks

Milan

Nov 2022 – Nov 2025

Junior Performance Consultant

Moviri S.p.A.

Dynatrace Admin - Monitoring and Observability Team

Milan

Oct 2021 – Nov 2022

Publications

Journal Articles

2025: Davide Salaorni, Federico Bianchi, Silvia Colnago, Andrea Barisione, Francesco Trovò, and Marcello Restelli. A novel digital twin for battery energy storage systems in micro-grids. *Journal of Energy Storage*, volume 132, page 117745, 2025. (Q1 Scimago).

2023: Andrés Murillo, Riccardo Taormina, Nils Ole Tippenhauer, Davide Salaorni, Robert van Dijk, Luc Jonker, Simcha Vos, Maarten Weyns, and Stefano Galelli. High-fidelity cyber and physical simulation of water distribution systems. i: Models and data. *Journal of Water Resources Planning and Management*, volume 149, page 04023009, 2023. (Q1 Scimago).

Conferences

2025: Davide Salaorni, Federico Bianchi, Francesco Trovò, and Marcello Restelli. A reinforcement learning approach for optimal control in microgrids. In *International Joint Conference on Neural Networks*, 2025. (B Core Ranking).

2024: Puze Liu et al. A retrospective on the robot air hockey challenge: Benchmarking robust, reliable, and safe learning techniques for real-world robotics. In *Advances in Neural Information Processing Systems*, 2024. (A* Core Ranking) - Acknowledgment of contribution.

Workshops

2025: **Davide Salaorni**, Vincenzo De Paola, Samuele Delperio, Giovanni Disposto, Paolo Bonetti, Alessio Russo, Giuseppe Calcagno, Francesco Trovò, Matteo Papini, Alberto Maria Metelli, Marco Mussi, and Marcello Restelli. Gym4Real: a benchmark suite for evaluating reinforcement learning in realistic domains. In *European Workshop on Reinforcement Learning*. EWRL, 2025.

2025: **Davide Salaorni**, Federico Bianchi, Francesco Trovò, and Marcello Restelli. Leveraging reinforcement learning for micro-grid optimal control. In *Computational Intelligence for Sustainable Energy Management in Microgrids and Renewable Energy Communities*. IJCNN, 2025.

2025: Samuele Delperio*, **Davide Salaorni***, Francesco Trovò, and Marcello Restelli. Optimal energy management of renewable energy communities: a multi-agent reinforcement learning approach. In *Machine Learning for Sustainable Power Systems*. ECML-PKDD, 2025.

2022: **Davide Salaorni**. Optimal real-time control of water distribution systems undergoing cyber-physical attacks. In *2nd Workshop on Control Methods for Water Resource Systems*. IFAC, 2022.

Under Review

2026: **Davide Salaorni**, Federico Bianchi, Francesco Trovò, and Marcello Restelli. Automatic control and reinforcement learning techniques for microgrids. *Digital twin technology and smart grid (Elsevier)*, 2026. Under review - Book chapter contribution.

2026: Samuele Delperio*, **Davide Salaorni***, Francesco Trovò, and Marcello Restelli. Aligning prosumers' interests in renewable energy communities through multi-agent reinforcement learning and reward shaping. *Engineering Applications Artificial Intelligence*, 2026. Under review - (Q1 Scimago).

In Preparation

2026: **Davide Salaorni**, Vincenzo De Paola, Samuele Delperio, Giovanni Disposto, Paolo Bonetti, Alessio Russo, Giuseppe Calcagno, Francesco Trovò, Matteo Papini, Alberto Maria Metelli, Marco Mussi, and Marcello Restelli. Gym4Real: Toward Real-World Reference Environments for Reinforcement Learning. In *ACM KDD*, 2026. In preparation - (A* Core Ranking).

2026: Davide Maran*, **Davide Salaorni***, and Marcello Restelli. Learning in Markov Decision Processes with Exogenous Dynamics. In *Forty-Third International Conference on Machine Learning (ICML)*, 2026. In preparation - (A* Core Ranking).

Competitions and Challenges

Robot Air Hockey Challenge '23

Team: RL3_polimi (4th placement)

Role: team supervisor (Politecnico di Milano)

NeurIPS Competition Track 2023

Oct 2022 - May 2023

Teaching Activity

Informatica B

Adjunct Lecturer of prof. Trovò at Politecnico di Milano

Teaching Programme: C, Matlab and computer science foundations.

28 Hours

Sep 2024 - Jan 2025

Informatica B

Adjunct Lecturer of prof. Trovò at Politecnico di Milano

Teaching Programme: C, Matlab and computer science foundations.

26 Hours

Sep 2023 - Jan 2024

Talks and Seminars

AirLab RL3 PhD meetings

Deterministic Policy Gradient Methods

Politecnico di Milano

13 February 2025

Other Academic Activities

Reviewer Activities

International Conferences and Workshops:

- NeurIPS - Conference on Neural Information Processing Systems
- ICML - International Conference on Machine Learning
- ICLR - International Conference on Learning Representations
- IJCNN - International Joint Conference on Neural Networks

International Journals:

- TMLR - Transactions on Machine Learning Research
- TNNLS - IEEE Transactions on Neural Networks and Learning Systems (Q1)
- PONE - PLoS ONE (Q1)

Participation in Schools

- EWRL 2025 - European Workshop on Reinforcement Learning (Tübingen, September 2025)
- MLSS 2025 - Machine Learning Summer School (Arequipa, August 2025)
- EWRL 2024 - European Workshop on Reinforcement Learning (Toulouse, October 2024)
- Synapse 2023 - AI Symposium by Bending Spoons (Milan, September 2023)
- RLVS 2021 - Reinforcement Learning Virtual School (Virtual, March 2021)

Tutoring Activities

- Ph.D. Manager Full-stack Development (Polimi, July 2024 - ongoing)
- Ph.D. Portal FrontEnd Development (Polimi, Nov 2023 - May 2024)
- *What a Polimi's Ph.D. student does for us?* - Video Recording and Editing (Polimi, May 2023 - Mar 2024)
- Ph.D. Shadowing - Am I an Innovator? (Polimi, Aug 2023)

Last update: Jan 31st 2026

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