

Mirco Mutti

Postdoc at the Technion

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Research Interest

I am interested in all the facets of *reinforcement learning*. My aim is to advance theoretical understanding that can lead to successful application of reinforcement learning in the real world.

Education

- 2023 **Ph.D. in Data Science and Computation**, *Università di Bologna and Politecnico di Milano*.
Thesis: Unsupervised Reinforcement Learning via State Entropy Maximization.
Advisor: Marcello Restelli.
Reviewers: Mohammad Gheshlaghi Azar, Lerrel Pinto.
- 2018 **M.Sc. in Computer Science and Engineering**, *Politecnico di Milano*, 110/110 cum laude.
Thesis: Configurable Markov Decision Processes.
Advisor: Marcello Restelli.
- 2015 **B.Sc. in Engineering of Computing Systems**, *Politecnico di Milano*, 110/110 cum laude.

Summer Schools

- 2019 **Machine Learning Summer School (MLSS)**, *University College London*.
- 2019 **Intrinsically Motivated Open-ended Learning (IMOL)**, *FIAS, Frankfurt*.

Appointments

- 2023-Present **Postdoc**, *Reinforcement Learning Research Labs, Technion - Israel Institute of Technology*.
Research Interest: Reinforcement learning from theory to practice.
Advisor: Aviv Tamar.
- 2018-2023 **PhD student**, *Artificial Intelligence and Robotics Lab, Politecnico di Milano*.
Research Interest: Unsupervised reinforcement learning.
Advisor: Marcello Restelli.
- 2018 **Research fellow**, *Artificial Intelligence and Robotics Lab, Politecnico di Milano*.
Research: Predictive models of disruptive events during drilling for ENI S.p.a., Italian Oil&Gas.

Teaching

- 2020-2022 **Teaching assistant** for *MACHINE LEARNING*, M.Sc. at Politecnico di Milano (1/2 TAs).
- 2018-2022 **Teaching assistant** for *INFORMATICA B*, B.Sc. at Politecnico di Milano (1/1 TA).

Honors

- 2023 **Honorable mention** for the best PhD thesis on artificial intelligence granted by the Italian Association for Artificial Intelligence (AIIA).
- 2021-2023 **Outstanding reviewer** at NeurIPS 2021, 2022, 2023, ICLR 2022, ICML 2022.
- 2023 **Expert reviewer** for the TMLR journal.
- 2022 **Outstanding paper award** at ICML 2022.
- 2019 **Thesis award** for the best Master's thesis on artificial intelligence granted by the Italian Association for Artificial Intelligence (AIIA).
- 2018 **Ph.D. scholarship** granted to Ph.D. applicants with outstanding merits by the Italian Ministry of Education, University and Research.
- Travel award** at ICML 2018 (Stockholm), MLSS 2019 (London), AAAI 2020 (New York), ICML 2022 (Baltimore), NeurIPS 2022 (New Orleans), AAAI 2023 (Washington D.C.).

Editorial Activities

- 2022 **Program Co-Chair** of the European Workshop on Reinforcement Learning (EWRL 2022).
Reviewer of NeurIPS (2021-2023), ICML (2021-2023), ICLR (2021-2024), AAAI (2021-2023), IJCAI (2020-2021), AISTATS (2021-2022), Machine Learning, and TMLR (Expert reviewer).
Action Editor of the TMLR journal.

Invited Talks

- 06/2023 **(Non)Convex Reinforcement Learning**, *ETH LAS group & AI Center*, Zurich, Switzerland.
02/2023 **Convex Reinforcement Learning**, *Rising Stars in AI Symposium 2023*, KAUST, Saudi Arabia.
09/2022 **Unsupervised Reinforcement Learning via State Entropy Maximization**, *Technion - Israel Institute of Technology*, Haifa, Israel.
05/2022 **Unsupervised Reinforcement Learning via State Entropy Maximization**, *Facebook AI Research - External Seminars*, Virtual.
11/2019 **Configurable Markov Decision Processes**, *International Conference of the Italian Association for Artificial Intelligence (AlxIA 2019)*, Cosenza, Italy.

Student Supervision

- 2023-2024 **Duilio Cirino**, M.Sc. in Computer Science and Engineering, Politecnico di Milano.
2023 **Stefano Civelli**, M.Sc. in Computer Science and Engineering, Politecnico di Milano.
2022-2023 **Vlad Marian Cimpeanu**, M.Sc. in Computer Science and Engineering, Politecnico di Milano.
2021-2023 **Majid Molaei**, M.Sc. in Telecommunications Engineering, Politecnico di Milano.
2021-2022 **Juan Calderon**, M.Sc. in Computer Science and Engineering, Politecnico di Milano.
2021-2022 **Pietro Maldini**, M.Sc. in Computer Science and Engineering, Politecnico di Milano.
2020-2021 **Mattia Mancassola**, M.Sc. in Computer Science and Engineering, Politecnico di Milano.
2020-2021 **Stefano Del Col**, M.Sc. in Computer Science and Engineering, Politecnico di Milano.
2019-2023 **Riccardo De Santi**, M.Sc. in Computer Science, ETH Zurich.
2019-2020 **Lorenzo Pratissoli**, M.Sc. in Computer Science and Engineering, Politecnico di Milano.
2018-2019 **Giovanni Pelosi**, M.Sc. in Computer Science and Engineering, Politecnico di Milano.

Publications

Journal

- [J1] **Mirco Mutti**, Riccardo De Santi, Piersilvio De Bartolomeis, and Marcello Restelli. *Convex Reinforcement Learning in Finite Trials*. JMLR, 2023.

Conference

- [11] **Mirco Mutti**, Riccardo De Santi, Marcello Restelli, Alexander Marx, and Giorgia Ramponi. *Exploiting Causal Graph Priors with Posterior Sampling for Reinforcement Learning*. ICLR 2024 (to appear).
[10] Martino Bernasconi, Matteo Castiglioni, Alberto Marchesi, and **Mirco Mutti**. *Persuading Farsighted receivers in MDPs: the Power of Honesty*. NeurIPS 2023.
[9] Alberto Maria Metelli, **Mirco Mutti**, and Marcello Restelli. *A Tale of Sampling and Estimation in Discounted Reinforcement Learning*. AISTATS 2023. Oral: 32/1689 (2%).
[8] **Mirco Mutti**, Riccardo De Santi, Emanuele Rossi, Juan Felipe Calderon, Michael Bronstein, and Marcello Restelli. *Provably Efficient Causal Model-Based Reinforcement Learning for Systematic Generalization*. AAAI 2023.
[7] **Mirco Mutti**, Riccardo De Santi, Piersilvio De Bartolomeis, and Marcello Restelli. *Challenging Common Assumptions in Convex Reinforcement Learning*. NeurIPS 2022.

- [6] **Mirco Mutti**, Riccardo De Santi, and Marcello Restelli. *The Importance of Non-Markovianity in Maximum State Entropy Exploration*. ICML 2022. Outstanding paper award: 10/5630 (0.17%).
- [5] **Mirco Mutti**, Stefano Del Col, and Marcello Restelli. *Reward-Free Policy Space Compression for Reinforcement Learning*. AISTATS 2022.
- [4] **Mirco Mutti**, Mattia Mancassola, and Marcello Restelli. *Unsupervised Reinforcement Learning in Multiple Environments*. AAAI 2022.
- [3] **Mirco Mutti**, Lorenzo Pratissoli, and Marcello Restelli. *Task-Agnostic Exploration via Policy Gradient of a Non-Parametric State Entropy Estimate*. AAAI 2021.
- [2] **Mirco Mutti** and Marcello Restelli. *An Intrinsically-Motivated Approach for Learning Highly Exploring and Fast Mixing Policies*. AAAI 2020.
- [1] Alberto Maria Metelli*, **Mirco Mutti***, and Marcello Restelli. *Configurable Markov Decision Processes*. ICML 2018. Long talk: 210/2473 (8.5%). *equal contribution

Selected workshop

- [W4] **Mirco Mutti**, Riccardo De Santi, Marcello Restelli, Alexander Marx, and Giorgia Ramponi. *Exploiting Causal Graph Priors with Posterior Sampling for Reinforcement Learning*. EWRL 2023.
- [W3] **Mirco Mutti**, Riccardo De Santi, Emanuele Rossi, Juan Felipe Calderon, Michael Bronstein, and Marcello Restelli. *Provably Efficient Causal Model-Based Reinforcement Learning for Systematic Generalization*. RLDM 2022.
- [W2] **Mirco Mutti** and Marcello Restelli. *An Approach for Learning Highly Exploring and Fast Mixing Policies via Intrinsic Motivation*. Workshop on Intrinsically Motivated Open-ended Learning (IMOL) 2019.
- [W1] Alberto Maria Metelli*, **Mirco Mutti***, and Marcello Restelli. *Configurable Markov Decision Processes*. EWRL 2018. *equal contribution