Andrea Tirinzoni
Postdoctoral Researcher at Meta (FAIR)

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Work Experience

Present Apr 2022	**Postdoctoral Researcher**, *Meta, Fundamental AI Research (FAIR) team*, Paris, France. *Research Topics:* Reinforcement Learning
Mar 2022 Apr 2021	**Postdoctoral Researcher**, *INRIA, SCOOL team*, Lille, France. *Research Topics:* Reinforcement Learning
Apr 2020 Jan 2020	**Research Intern**, *Facebook AI Research*, Paris, France. *Research Topics:* Exploration-exploitation in structured bandits *Supervisor:* Alessandro Lazaric
May 2017 Jan 2017	**Research Assistant**, *Purposeful Prediction Laboratory, University of Illinois at Chicago*. *Research Topics:* Inverse Reinforcement Learning, Robust Control, Adversarial Prediction *Supervisor:* Brian Ziebart
Aug 2011 Jun 2011	**Internship**, *Bankadati Credito Valtellinese*, Sondrio, Italy. System and network administration

Education

Mar 2021	**Ph.D. cum laude in Computer Science**, *Politenico di Milano*, Milan, Italy. *Thesis*: "Exploiting Structure for Transfer in Reinforcement Learning" Advisor: Marcello Restelli
Oct 2017	**M.Sc. in Computer Science and Engineering**, *Politenico di Milano*, Milan, Italy. *Final Mark*: 110/110 summa cum laude *Thesis*: "Adversarial Imitation Learning under Covariate Shift" Advisor: Marcello Restelli
May 2017	**M.Sc. in Computer Science**, *University of Illinois at Chicago*, Chicago, Illinois. *Final GPA*: 4.0/4 *Thesis*: "Adversarial Inverse Reinforcement Learning with Changing Dynamics" Advisor: Brian Ziebart
Jul 2015	**B.Sc. in Computer Engineering**, *Politenico di Milano*, Milan, Italy. *Final Mark*: 110/110 summa cum laude

Awards, Scholarships, and Grants

From 2019	Reviewer awards: top 50% NeurIPS 2019 reviewers, top 33% ICML 2020 reviewers, outstanding reviewer award at ICLR 2021, top 8% NeurIPS 2021 reviewers
2018 - 2019	Travel awards: ICML 2018, 2019, NeurIPS 2018
Jul 2017	Ph.D. scholarship granted by the Italian Ministry of Education, University and Research
Jun 2017	Scholarship "Tesi all'estero" for the best students doing a master's thesis in a foreign country
Jul 2016	UIC scholarship for the best Italian graduate student in Computer Science
May 2016	Scholarship "SEM" for the best students that are residents in Valtellina
May 2014	Scholarship "SEM" for the best students that are residents in Valtellina

Teaching

Dec 2021 Sep 2021	**Teaching Assistant**, *Reinforcement Learning*, ENS Paris-Saclay, Paris, France. Master MVA (Mathématiques, Vision, Apprentissage) *Lecturer:* Matteo Pirotta

Dec 2019 Sep 2019	**Teaching Assistant**, *INFORMATICA*, Politenico di Milano, Milan, Italy. Bachelor's degree in Civil Engineering *Lecturer:* Marcello Restelli *Topics:* C and Fortran programming
July 2019 July 2019	**Teaching Assistant**, *Reinforcement Learning Summer SCOOL*, Inria, Lille, France. *Topics:* Reinforcement Learning and Bandits
Dec 2018 Sep 2018	**Laboratory Assistant**, *INFORMATICA B*, Politenico di Milano, Milan, Italy. Bachelor's degree in Mechanical Engineering *Lecturer:* Luca Cassano *Topics:* C and MATLAB programming
June 2018 Mar 2018	**Teaching Assistant**, *Web and Internet Economics*, Politenico di Milano, Milan, Italy. Master's degree in Computer Science and Engineering *Lecturer:* Nicola Gatti *Topics:* Markov Decision Processes, Reinforcement Learning, Multi-armed Bandits
Dec 2017 Sep 2017	**Laboratory Assistant**, *INFORMATICA B*, Politenico di Milano, Milan, Italy. Bachelor's degree in Mechanical Engineering *Lecturer:* Luca Cassano *Topics:* C and MATLAB programming

Schools

July 2019	**Machine Learning Summer School (MLSS)**, *UCL*, London, England.
July 2019	**Reinforcement Learning Summer SCOOL (RLSS)**, *Inria*, Lille, France.

Student Supervision

Mar 2021 Sep 2017	**Thesis Supervision**, I have supervised more than 15 MS theses, including research projects and industrial collaborations, on topics related to transfer/meta RL, exploration in RL, model-based RL, policy search, risk-averse & robust RL, bandits, autonomous driving, car racing.

Industrial Collaborations

Mar 2021 Dec 2020	**RSE**, *Machine Learning for Photovoltaic Systems*. *Topics:* Machine learning methods for fault detection and diagnosis in photovoltaic systems.
Mar 2021 Sep 2019	**Ferrari**, *Reinforcement Learning for Car Racing*. *Topics:* RL and inverse RL techniques for several car racing applications.
Mar 2021 Dec 2017	**Magneti Marelli**, *Reinforcement Learning for Autonomous Driving*. *Topics:* RL and inverse RL techniques for high-level decision-making in autonomous driving.

Editorial Activities

From 2021	**Senior Program Committee**, *AAAI 2022, ALT 2024*.
From 2017	**Program Committee**, *NeurIPS 2019, 2020, 2021, 2022, 2023, ICML 2020, 2021, 2022, 2023, AAAI 2020, 2021, ICLR 2020, 2021, AISTATS 2021*.
From 2017	**Program Committee Subreviewer**, *IROS 2017, AAAI 2018, IJCAI 2018, AAAI 2019*.

Event Organization

2023	**Program Chair for EWRL 2023**, I co-organized the 16th European Workshop on Reinforcement Learning (EWRL), which took place on September 14th-16th 2023 in Brussels (https://ewrl.wordpress.com/ewrl16-2023). EWRL is one of the major gatherings of RL researchers worldwide ($\sim$250 participants, $\sim$150 submitted papers).

Talks and Seminars

Talks at International Conferences

Jun 2019	**Transfer of Samples in Policy Search via Multiple Importance Sampling**, *International Conference on Machine Learning*, Long Beach, California, 2019.
Dec 2018	**Policy-Conditioned Uncertainty Sets for Robust Markov Decision Processes**, *Neural Information Processing Systems*, Montreal, Canada, 2018.

| Jul 2018 | **Importance Weighted Transfer of Samples in Reinforcement Learning**, *International Conference on Machine Learning*, Stockholm, Sweden, 2018. |

Talks at International Workshops

| Oct 2018 | **Transferring Value Functions via Variational Methods**, *European Workshop on Reinforcement Learning*, Lille, France, 2018. |
| Jul 2018 | **Policy-Conditioned Uncertainty Sets for Robust Markov Decision Processes**, *Workshop on Planning and Learning @ ICML 2018*, Stockholm, Sweden, 2018.. |

Seminars

| Sep 2019 | **Structured Multi-Armed Bandits**, *DEIB*, Politecnico di Milano, Milan, Italy. |
| Feb 2018 | **Meta Reinforcement Learning**, *DEIB*, Politecnico di Milano, Milan, Italy. |

Publications

Conference Papers

[C22] Aymen Al-Marjani, Andrea Tirinzoni, and Emilie Kaufmann. "Active Coverage for PAC Reinforcement Learning". In *Conference on Learning Theory* (COLT), Bangalore, India, 2023.

[C21] Liyu Chen, Andrea Tirinzoni, Alessandro Lazaric, and Matteo Pirotta. "Layered State Discovery for Incremental Autonomous Exploration". In *International Confernce on Machine Learning* (ICML), Hawaii, 2023.

[C20] Andrea Tirinzoni, Matteo Pirotta, and Alessandro Lazaric. "On the Complexity of Representation Learning in Contextual Linear Bandits". In *International Conference on Artificial Intelligence and Statistics* (AISTATS), Valencia, Spain, 2023.

[C19] Liyu Chen, Andrea Tirinzoni, Matteo Pirotta, and Alessandro Lazaric. "Reaching Goals is Hard: Settling the Sample Complexity of the Stochastic Shortest Path". In *International Conference on Algorithmic Learning Theory 34* (ALT), Singapore, 2023.

[C18] Andrea Tirinzoni, Aymen Al-Marjani, and Emilie Kaufmann. "Optimistic PAC Reinforcement Learning: the Instance-Dependent View". In *International Conference on Algorithmic Learning Theory 34* (ALT), Singapore, 2023.

[C17] Andrea Tirinzoni, Matteo Papini, Ahmed Touati, Alessandro Lazaric, and Matteo Pirotta. "Scalable Representation Learning in Linear Contextual Bandits with Constant Regret Guarantees". In *Advances in Neural Information Processing Systems 35* (NeurIPS), New Orleans, 2022.

[C16] Andrea Tirinzoni, Aymen Al-Marjani, and Emilie Kaufmann. "Near Instance-Optimal PAC Reinforcement Learning for Deterministic MDPs". In *Advances in Neural Information Processing Systems 35* (NeurIPS), New Orleans, 2022.

[C15] Andrea Tirinzoni and Rémy Degenne. "On Elimination Strategies for Bandit Fixed-Confidence Identification". In *Advances in Neural Information Processing Systems 35* (NeurIPS), New Orleans, 2022.

[C14] Clemence Reda, Andrea Tirinzoni, and Remy Degenne. "Dealing with Misspecification in Fixed-Confidence Linear Top-m Identification". In *Advances in Neural Information Processing Systems 34* (NeurIPS), Online, 2021.

[C13] Matteo Papini*, Andrea Tirinzoni*, Aldo Pacchiano, Marcello Restelli, Alessandro Lazaric, and Matteo Pirotta. "Reinforcement Learning in Linear MDPs: Constant Regret and Representation Selection". In *Advances in Neural Information Processing Systems 34* (NeurIPS), Online, 2021.

[C12] Matteo Papini, Andrea Tirinzoni, Marcello Restelli, Alessandro Lazaric, and Matteo Pirotta. "Leveraging Good Representations in Linear Contextual Bandits". In *International Confernce on Machine Learning* (ICML), Online, 2021.

[C11] Riccardo Poiani, Andrea Tirinzoni, and Marcello Restelli. "Meta-Reinforcement Learning by Tracking Task Non-stationarity". In *International Joint Conference on Artificial Intelligence* (IJCAI), Montreal, Canada, 2021.

[C10] Andrea Tirinzoni, Matteo Pirotta, Marcello Restelli, and Alessandro Lazaric. "An Asymptotically Optimal Primal-Dual Incremental Algorithm for Linear Contextual Bandits". In *Advances in Neural Information Processing Systems 33* (NeurIPS), Vancouver, Canada, 2020.

[C9] Andrea Tirinzoni, Riccardo Poiani, and Marcello Restelli. "Sequential Transfer in Reinforcement Learning with a

Generative Model". In *International Conference on Machine Learning* (ICML), Vienna, Austria, 2020.

[C8] Andrea Tirinzoni, Alessandro Lazaric, and Marcello Restelli. "A Novel Confidence-Based Algorithm for Structured Bandits". In *International Conference on Artificial Intelligence and Statistics* (AISTATS), Palermo, Italy, 2020.

[C7] Giorgia Ramponi, Amarildo Likmeta, Alberto Maria Metelli, Andrea Tirinzoni, and Marcello Restelli. "Truly Batch Model-Free Inverse Reinforcement Learning about Multiple Intentions". In *International Conference on Artificial Intelligence and Statistics* (AISTATS), Palermo, Italy, 2020.

[C6] Pierluca D'Oro, Alberto Maria Metelli, Andrea Tirinzoni , Matteo Papini, and Marcello Restelli. "Gradient-Aware Model-Based Policy Search". In *AAAI*, New York, 2020.

[C5] Andrea Tirinzoni, Mattia Salvini, and Marcello Restelli. "Transfer of Samples in Policy Search via Multiple Importance Sampling". In *Proceedings of the 36th International Conference on Machine Learning* (ICML), Long Beach, California, 2019. (acceptance rate: 773/3424 (22.57%))

[C4] Mario Beraha, Alberto Maria Metelli, Matteo Papini, Andrea Tirinzoni, and Marcello Restelli. "Feature Selection via Mutual Information: New Theoretical Insights". In *International Joint Conference on Neural Networks* (IJCNN), Budapest, Hungary, 2019.

[C3] Andrea Tirinzoni, Xiangli Chen, Marek Petrik, and Brian Ziebart. "Policy-Conditioned Uncertainty Sets for Robust Markov Decision Processes". In *Advances in Neural Information Processing Systems 31* (NeurIPS), Montreal, Canada, 2018. Spotlight. (acceptance rate: 168/4856 (3.46%))

[C2] Andrea Tirinzoni, Rafael Rodriguez, and Marcello Restelli. "Transfer of Value Functions via Variational Methods". In *Advances in Neural Information Processing Systems 31* (NeurIPS), Montreal, Canada, 2018. (acceptance rate: 1011/4856 (20.82%))

[C1] Andrea Tirinzoni, Andrea Sessa, Matteo Pirotta, and Marcello Restelli. "Importance Weighted Transfer of Samples in Reinforcement Learning". In *Proceedings of the 35th International Conference on Machine Learning* (ICML), Stockholm, Sweden, 2018. (acceptance rate: 618/2473 (24.99%))

Journal Papers

[J3] Lorenzo Bisi, Davide Santambrogio, Federico Sandrelli, Andrea Tirinzoni, Brian D. Ziebart, and Marcello Restelli. "Risk-Averse Policy Optimization via Risk-Neutral Policy Optimization". Artificial Intelligence, 2022.

[J2] Amarildo Likmeta, Alberto Maria Metelli, Giorgia Ramponi, Andrea Tirinzoni, Matteo Giuliani, and Marcello Restelli. "Dealing with Multiple Experts and Non-stationarity in Inverse Reinforcement Learning: an Application to Real-life Problems". Machine Learning, 2021.

[J1] Amarildo Likmeta, Alberto Maria Metelli, Andrea Tirinzoni, Riccardo Giol, Marcello Restelli, and Danilo Romano. "Combining Reinforcement Learning with Rule-based Controllers for Transparent and General Decision-making in Autonomous Driving". Robotics and Autonomous Systems, 2020.

Workshop Papers

[W4] Andrea Tirinzoni, Matteo Pirotta, and Alessandro Lazaric. "A Fully Problem-Dependent Regret Lower Bound for Finite-Horizon MDPs". Workshop on Reinforcement Learning Theory @ ICML 2021.

[W3] Pierluca D'Oro, Alberto Maria Metelli, Andrea Tirinzoni , Matteo Papini, and Marcello Restelli. "Gradient-Aware Model-Based Policy Search". Meta-Learning Workshop @ NeurIPS 2019.

[W2] Andrea Tirinzoni, Rafael Rodriguez, and Marcello Restelli. "Transferring Value Functions via Variational Methods". In *European Workshop on Reinforcement Learning 14*, Lille, France, 2018. Oral.

[W1] Andrea Tirinzoni, Xiangli Chen, Marek Petrik, and Brian Ziebart. "Policy-Conditioned Uncertainty Sets for Robust Markov Decision Processes". In *Workshop on Planning and Learning @ ICML 2018*, Stockholm, Sweden, 2018. Oral.

Theses

[Ph.D. thesis] "Exploiting structure for transfer in reinforcement learning ". Politenico di Milano, 2021.
[Master thesis] "Adversarial imitation learning under covariate shift ". Politenico di Milano, 2017.
[Master thesis] "Adversarial inverse reinforcement learning with changing dynamics". University of Illinois at Chicago (UIC), 2017.

Languages

Italian: Mother tongue
English: Fluent (TOEFL 100/120)
French: Basic knowledge

Computer Skills

Operating Systems	GNU/Linux, Microsoft Windows, Mac OS
Programming Languages	Python, Java, C, C++, C#, Scala, MATLAB, R, Lua, Javascript, PHP, Lisp
Frameworks	Apache Spark, Tensorflow, Keras, Pytorch
IDEs	Eclipse, PyCharm, Visual Studio, MATLAB, Dev-C++, VS Code
Typesetting	LaTex, HTML, Microsoft Word