

Matteo Pirotta

Postdoctoral Researcher at Politecnico di Milano

Piazza Leonardo da Vinci, 32
Milano, 20133, Italy
✉ matteo.pirotta@polimi.it
📄 teopir.github.io
🌐 [teopir](#)

Curriculum Vitae

Matteo Pirotta is a postdoctoral researcher at the Politecnico di Milano (Italy). He received his PhD in Information Technology from the Politecnico di Milano (Italy) in 2016. His main research interest is in reinforcement learning and online learning. His works are equally balanced between theory and applications. A particular focus is posed on financial applications involving portfolio management and trading, just to mention a few. Dr. Pirotta has been employed in industry and has worked as scientific advisor.

Work Experience

- 06/16–present **Politecnico di Milano**, (*Milano, Italy*), Postdoctoral Researcher.
Supervisor: Prof. M. Restelli
- 11/15–05/16 **UniCredit**, (*Milano, Italy*), Artificial Intelligence, ICT Project Manager.
Member of a small team applying machine learning to solve complex real problems.

Education

- 01/16 **PhD in Information Technology**, *Politecnico di Milano, PhD cum laude*.
Thesis: “*Reinforcement Learning: from Theory to Algorithms*.”
Supervisors: Prof. L. Bascetta and Prof. M. Restelli
- Awards:**
- *Dimitris N. Chorafas Foundation Award 2016*.
 - *Honourable mention* for the EurAI Distinguished Dissertation Award 2015.
- Research visits:**
- Intelligent Autonomous Systems, Technische Universitaet Darmstadt, Darmstadt (Germany), March-August 2015. Headed by Prof. Jan Peters.
- PhD Schools:**
- Online Learning Summer School, Copenhagen (Denmark), July 2015
 - Machine Learning Summer School, Tübingen (Germany), August-September 2013
 - Regularization Methods For High Dimensional Learning, Genova (Italy), June 2013
- 09/12 **Master of Science in Computer Engineering**, *Politecnico di Milano, 110/110 cum laude*.
Thesis: “*Safe Policy Iteration: A Monotonically Improving Approximate Policy Iteration Approach*.”
- Awards:**
- Special mention from AI*IA (Associazione Italiana per l’Intelligenza Artificiale) among best Italian master thesis
- ## Honors
- 09/16 *Dimitris N. Chorafas Foundation Award 2016* (PhD thesis).
- 09/16 *Honourable mention* for the EurAI Distinguished Dissertation Award 2015 (PhD thesis).
- 12/12 *Special mention* from AI*IA (Associazione Italiana per l’Intelligenza Artificiale) among best Italian master thesis.

Publications

International Journals

- [J1] S. Parisi, M. Pirotta and J. Peters. “Manifold-based Multi-objective Policy Search with Sample Reuse”. In: *Neurocomputing* (Accepted 2016).
- [J2] S. Parisi, M. Pirotta and M. Restelli. “Multi-objective Reinforcement Learning through Continuous Pareto Manifold Approximation”. In: *Journal of Artificial Intelligence Research* 57 (October 2016), pp. 187–227.
- [J3] G. Manganini, M. Pirotta, M. Restelli, L. Piroddi and M. Prandini. “Policy search for the optimal control of Markov decision processes: a novel particle-based iterative scheme”. In: *IEEE Transactions on Cybernetics* (October 2015), pp. 1–13.
- [J4] M. Pirotta, M. Restelli and L. Bascetta. “Policy Gradient in Lipschitz MDPs”. In: *Machine Learning* 100 (September 2015), pp. 255–283.

International Conferences and Workshops

- [C1] M. Pirotta and M. Restelli. “Inverse Reinforcement Learning through Policy Gradient Minimization”. In: *Proc. of the 30th AAAI Conference on Artificial Intelligence, AAAI, Phoenix, Arizona, USA, February 2016*. AAAI Press, 2016. (acceptance rate: 549/2132 (25.8%), oral presentation: 263/2132 (12.3%))
- [C2] M. Pirotta, S. Parisi and M. Restelli. “Multi-Objective Reinforcement Learning with Continuous Pareto Frontier Approximation”. In: *Proc. of the 29th AAAI Conference on Artificial Intelligence, AAAI, Austin, Texas, USA, January 2015*. AAAI Press, 2015. (acceptance rate: 531/1991 (26.7%))
- [C3] D. Caporale, L. Deori, R. Mura, A. Falsone, R. Vignali, L. Giulioni, M. Pirotta and G. Manganini. “Optimal Control to Reduce Emissions in Gasoline Engines: An Iterative Learning Control Approach for ECU Calibration Maps Improvement”. In: *European Control Conference, ECC, Linz, Austria, July 2015*.
- [C4] G. Manganini, M. Pirotta, M. Restelli and L. Bascetta. “Following Newton Direction in Policy Gradient with Parameter Exploration”. In: *Proc. of the International Joint Conference on Neural Networks, IJCNN, Killarney, Ireland, July 2015*.
- [C5] S. Parisi, M. Pirotta, N. Smacchia, L. Bascetta and M. Restelli. “Policy Gradient Approaches for Multi-Objective Sequential Decision Making: A Comparison”. In: *IEEE Symposium on Adaptive Dynamic Programming and Reinforcement Learning, ADPRL, Orlando, Florida, USA, December 2014*. IEEE, 2014.
- [C6] S. Parisi, M. Pirotta, N. Smacchia, L. Bascetta and M. Restelli. “Policy Gradient Approaches for Multi-Objective Sequential Decision Making”. In: *Proc. of the International Joint Conference on Neural Networks, IJCNN, Beijing, China, July 2014*.
- [C7] M. Pirotta, G. Manganini, L. Piroddi, M. Prandini and M. Restelli. “A particle-based policy for the optimal control of Markov decision processes”. In: *Proc. of the 19th IFAC World Congress, IFAC, Cape Town, South Africa, August 2014*.
- [C8] M. Pirotta, M. Restelli and L. Bascetta. “Adaptive Step-Size for Policy Gradient Methods”. In: *Advances in Neural Information Processing Systems 27, NIPS, Lake Tahoe, Nevada, USA, December 2013*. (acceptance rate: 360/1420 (25.3%))
- [C9] M. Pirotta, M. Restelli, A. Pecorino, and D. Calandriello. “Safe policy iteration”. In: *Proc. of the 30th International Conference on Machine Learning, ICML, Atlanta, Georgia, USA, July 2013*. (acceptance rate: 283/1204 (23.5%); oral presentation: 143/1204 (11.9%))
- [C10] M. Migliavacca, A. Pecorino, M. Pirotta, M. Restelli and A. Bonarini. “Fitted Policy Search”. In: *IEEE Symposium on Adaptive Dynamic Programming and Reinforcement Learning, ADPRL, Paris, France, April 2011*. IEEE, 2011.
- [C11] M. Migliavacca, A. Pecorino, M. Pirotta, M. Restelli and A. Bonarini. “Fitted Policy Search: Direct Policy Search using a Batch Reinforcement Learning Approach”. In: *Proc. of the 3rd International*

Teaching Activities

- 2015 **Teaching assistant**, *Politecnico di Milano*, Milano, Italy.
Course “Fondamenti di Informatica”, Prof. C. Bolchini, Bachelor in Computer Engineering
- 2014 **Laboratory Tutor**, *Politecnico di Milano*, Milano, Italy.
Course “Informatica A”, Prof. O. Mejri, Bachelor in Business Engineering
- 2014 **Laboratory Tutor**, *Politecnico di Milano*, Milano, Italy.
Course “Informatica B”, Prof. V. Zaccaria, Bachelor in Mechanical Engineering
- 2013 **Teaching assistant**, *Politecnico di Milano*, Milano, Italy.
Course “Robotics”, Prof. M. Restelli, Bachelor in Computer Engineering
- 2013 **Laboratory Tutor**, *Politecnico di Milano*, Milano, Italy.
Course “Fondamenti di Automatica”, Prof. L. Bascetta, Bachelor in Aerospace Engineering

Scientific Activities

- Reviewer
 - International Journals: Journal of Machine Learning Research, Adaptive Behavior
 - International Conferences: AAAI 2017, NIPS 2015-2016

Project and Funding

Industrial Projects

- 2016 **Investigator**, *Machine Learning for DVA Hedging*, Reply s.p.a..
- 2016 **Investigator**, *Machine Learning for Swaption Calibration*, Intesa San Paolo Group Service.
- 2016 **Investigator**, *Development of data-driven models for Cyber Tyre*, Pirelli s.p.a..

Research Projects

- 2013 **Investigator**, *FIDELIO - FIxtureless DEburring of wheelS by human demonstratiOn*, (EU Project).