

Francesco Trovò

Curriculum Vitae - Short

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Highlights

- Assistant Professor at DEIB, Politecnico di Milano, since March 2020.
- Research interests in *online machine learning for microeconomics environments*.
- 8 papers in international journals, including 1 paper on Artificial Intelligence Journal and 1 paper on Journal of Artificial Intelligence Research (premier journals for the AI field) and 1 paper on IEEE Transactions on Neural Networks (premier journal for the CI field). According to ANVUR: 3 papers in Class 1 and 3 in Class 2.
- 20 conference papers, including 2 papers on AAAI (premier conference for the artificial intelligence field) and 1 paper on WWW (premier conference for the web field), 1 paper on EC and 1 paper on UAI (top conferences in artificial intelligence). According to the GGS classification: 3 papers in Class A++, and 4 papers in Class A+.
- Lecturer for the course *Informatica B* in the B.Sc. program at Politecnico di Milano (since a.y. 2018/2019) and for the course *Intelligenza Artificiale* in the M.Sc. program at Università degli Studi di Bergamo (since a.y. 2017/2018). T.A. for the course *Machine Learning* in the M.Sc. program at Politecnico di Milano (since a.y. 2015/2016).
- Research scientist in 13 research projects, among which the EU-funded project “iSense” (2012 – 2014), the MIUR-funded PRIN “ALGADIMAR” (2019-Today), a project founded by Regione Lombardia (2017 – 2020), and several projects funded by private companies, e.g., Lastminute.com, Pirelli, Ferrari (2013-Today).
- Co-founder of the Politecnico di Milano Spin-off company *MLcube* (www.mlcube.com), which aims at transferring AI cutting-edge methods to the industrial world.
- Supervisor of more than 30 M.Sc. theses at Politecnico di Milano.

Research Experience

- 03/2020–Today **Assistant Professor**, *Politecnico di Milano, DEIB*.
04/2015 – 02/2020 **Research Assistant**, *Politecnico di Milano, DEIB*.
01/2012 – 03/2015 **Ph.D. in Information Technology**, *Politecnico di Milano, DEIB*.

Education

- 09/2009 – 10/2011 **M.Sc. in Machine Learning and Data Mining** (4.47/5), *Aalto University*.
10/2008 – 12/2011 **M.Sc. in Mathematical Engineering** (95/110), *Politecnico di Milano*.
09/2005 – 09/2008 **B.Sc. in Mathematical Engineering** (105/110), *Politecnico di Milano*.

Teaching Activities

- 2020 **Lecturer, Online Learning and Monitoring**, *Ph.D. Course*, Politecnico di Milano.
2018–Today **Lecturer, Informatica B**, *B.Sc. in Mechanical Engineering*, Politecnico di Milano.
2018 – 2020 **Lecturer, Intelligenza Artificiale**, *M.Sc. in Computer Engineering*, Università degli Studi di Bergamo.
2019–Today **TA, Machine Learning for Networking**, *Passion in Action*, Politecnico di Milano.
2016–Today **TA, Machine Learning**, *M.Sc. in Computer Engineering*, Politecnico di Milano.
2014 – 2017 **TA, Informatica B**, *B.Sc. in Mechanical Engineering*, Politecnico di Milano.

Participation to Scientific Conference Committees

- 2020 **Workflow Chair**, *AISTATS*, International Conference on Artificial Intelligence and Statistics.
2021 **Program Committee**, *NeurIPS*, Conference on Neural Information Processing Systems.
2017 – 2021 **Program Committee**, *AAAI*, Conference on Artificial Intelligence.
2017 – 2021 **Program Committee**, *IJCAI*, International Joint Conference on Artificial Intelligence.
2019 – 2020 **Program Committee**, *AAMAS*, Conference on Autonomous Agents and Multiagent Systems.

Selected Publications

Journals

- 2020 F. Trovò, S. Paladino, M. Restelli, N. Gatti, "Sliding-Window Thompson Sampling for Non-Stationary Settings", *Journal of Artificial Intelligence Research*, AI Access Foundation, 2020, Volume 68, pp 311–364 (DOI: 10.1613/jair.1.11407).
- 2018 F. Trovò, S. Paladino, M. Restelli, N. Gatti, "Improving Multi-armed Bandit Algorithms in Online Pricing Settings", *International Journal of Approximate Reasoning*, Elsevier, 2018, Volume 98, pp 196–235 (DOI: 10.1016/j.ijar.2018.04.006).
- 2017 M. Roveri, F. Trovò, "An Ensemble Approach for Cognitive Fault Detection and Isolation in Sensor Networks", *International Journal of Neural Systems*, World Scientific, 2017, Volume 27(3), pp 1–16 (DOI: 10.1142/S0129065716500477).
- 2015 N. Gatti, A. Lazaric, M. Rocco, F. Trovò, "Truthful Learning Mechanisms for Multi-Slot Sponsored Search Auctions with Externalities", *Artificial Intelligence*, Elsevier, 2015, Volume 227, pp 93–139 (DOI: 10.1016/j.artint.2015.05.012).
- 2014 C. Alippi, M. Roveri, F. Trovò, "A Self-Building and Cluster-Based Cognitive Fault Diagnosis System for Sensor Networks", *IEEE Transactions on Neural Networks and Learning Systems*, 2014, Volume 25(64), pp 1021–1032 (DOI: 10.1109/TNNLS.2014.2303651).

Conferences

- 2020 A. Marchesi, F. Trovò, N. Gatti, "Learning Probably Approximately Correct Maximin Strategies in Simulation-Based Games with Infinite Strategy Spaces", proceedings of the International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2020, pp 834–842 (**acc. rate: 186/808, 23.0%**).
- 2019 A. Nuara, N. Sosio, F. Trovò, M.C. Zaccardi, N. Gatti, M. Restelli, "Dealing with Interdependencies and Uncertainty in Multi-Channel Advertising Campaigns Optimization", *The Web Conference (WWW)*, 2019, pp 1376–1386 (DOI: 10.1145/3308558.3313470) (**acc. rate: 225/1247, 18.0%**).
- 2018 A. Nuara, F. Trovò, N. Gatti, M. Restelli, "A Combinatorial-Bandit Algorithm for the Online Joint Bid/Budget Optimization of Pay-per-Click Advertising Campaigns", proceedings of the Conference on Artificial Intelligence (AAAI), 2018, pp 2379–2386 (**acc. rate: 933/3800, 24.6%**).
- 2017 L. Bisi, G. De Nittis, F. Trovò, M. Restelli, N. Gatti, "Regret Minimization Algorithms for the Follower's Behaviour Identification in Leadership Games", proceedings of the Conference on Uncertainty in Artificial Intelligence (UAI), 2017, pp 1–10, (**acc. rate: 87/282, 30.9%**).
- 2017 S. Paladino, F. Trovò, M. Restelli, N. Gatti, "Unimodal Thompson Sampling for Graph-Structured Arms", proceedings of the Conference on Artificial Intelligence (AAAI), 2017, pp 2457–2463 (DOI: 10.5555/3298483.3298593) (**acc. rate: 638/2590, 24.6%**).
- 2016 F. Trovò, S. Paladino, M. Restelli, N. Gatti, "Budgeted Multi-armed Bandit in Continuous Action Space", proceedings of the European Conference on Artificial Intelligence (ECAI), 2016 (DOI: 10.3233/978-1-61499-672-9-560) (**acc. rate: 177/656, 27.0%**).
- 2012 N. Gatti, A. Lazaric, F. Trovò, "A Truthful Learning Mechanism for Multi-slot Sponsored Search Auctions with Externalities", proceedings of the ACM Conference on Electronic Commerce (EC), 2012, (DOI: 10.1145/2229012.2229057) (**acc. rate: 57/219, 26.0%**).

Selected Research Projects

- 11/2019 - Today **BEst**, *senior research scientist*, founded by RSE SpA.
- 11/2019 - Today **HotelBid**, *research scientist*, founded by AdsHotel.
- 11/2019 - Today **PRIN ALGADIMAR**, *research scientist*, founded by MIUR.
- 09/2018 - Today **Aero**, *research scientist*, founded by Ferrari SpA.
- 10/2016 - 02/2020 **Total Efficiency 4.0**, *research scientist*, founded by Regione Lombardia.
- 11/2015 - 05/2017 **CyberFleet**, *research scientist*, founded by Pirelli & C. SpA.
- 04/2015 - 02/2019 **Methamatics**, *research scientist*, founded by Lastminute.com.
- 01/2012 - 02/2014 **iSense**, *research scientist*, founded by EU 7th framework programme.

Francesco Trovò

Curriculum Vitae - Extended

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Short Bio

Francesco Trovò (Milano, Italy, 5 July 1986) is an assistant professor with the Dipartimento di Elettronica, Informazione e Bioingegneria at the Politecnico di Milano (Italy). He received his Ph.D. in Information Technology from the Politecnico di Milano (Italy) in 2015. His main research interest is on *online machine learning*, specifically for microeconomic and competitive environments.

Research Interests

Nowadays, most of the existing websites interacts with their visitors dynamically, by adapting their marketing and selling strategies based on users information and feedbacks. Generally, this scenario is characterized by uncertainty about the user preferences and/or the Internet environment. A practical example is represented by e-commerce websites, in which a seller wants to display the price that maximizes her revenue only by basing on partial information about buyers and competitors. To tackle this problem it is possible to use of the historical data logged during past transactions and also to exploit, in an on-line manner, the interactions currently ongoing with the user. My main research interest is the development of models and corresponding methods, based on online learning algorithms, to deal with the microeconomics scenarios presented by the Internet environment. Indeed, these techniques exploit the available data and take sequential decision, as new information is obtained, improving the capabilities of the algorithms over time. For instance, some of the specific applicative scenarios where these techniques have been successfully applied in the past are the problem of pricing in e-commerce scenario [J8, J6, C8, C7, C6], e.g., online travel agencies, and the management of sponsored search links on search engines [J3, C15, C14, C11, C10, C2, C1], e.g., Google AdWords.

Research Experience

- 03/2020 - Today **Assistant Professor**, *Politecnico di Milano, Dipartimento di Elettronica, Informazione e Bioingegneria*, Milano, Italy.
Topic: Online Learning Techniques for Microeconomic Environments
- 04/2018 - 02/2020 **Research Assistant**, *Politecnico di Milano, Dipartimento di Elettronica, Informazione e Bioingegneria*, Milano, Italy.
Topic: Sviluppo di tecniche multi-armed bandit per il pricing di biglietti aerei.
Project Leader: Prof. Marcello Restelli.
- 04/2017 - 03/2018 **Research Assistant**, *Politecnico di Milano, Dipartimento di Elettronica, Informazione e Bioingegneria*, Milano, Italy.
Topic: Developing online learning techniques for digital economic scenarios.
Project Leader: Prof. Nicola Gatti.
- 04/2016 - 03/2017 **Research Assistant**, *Politecnico di Milano, Dipartimento di Elettronica, Informazione e Bioingegneria*, Milano, Italy.
Topic: Development of Machine Learning Techniques for Security Games.
Tutor: Prof. Nicola Gatti.
- 04/2015 - 03/2016 **Research Assistant**, *Politecnico di Milano, Dipartimento di Elettronica, Informazione e Bioingegneria*, Milano, Italy.
Topic: Flight Clustering Algorithms for Best Price Learning.
Project Leader: Prof. Nicola Gatti.

01/2012 - 03/2015 **Ph.D. in Information Technology**, *Politecnico di Milano, Dipartimento di Elettronica, Informazione e Bioingegneria*, Milano, Italy.
Topic: Machine Learning Techniques for Fault Detection, Isolation and Identification in Sensors/Actuators Networks.
Thesis: A Cognitive Fault Diagnosis System for Sensor Networks.
Supervisor: Prof. Manuel Roveri.

Education

09/2009 - 10/2011 **M.Sc. in Machine Learning and Data Mining**, *Aalto University, School of Science and Technology*, Espoo, Finland, 4.47/5.
Thesis: Regret Estimation for Multi-Slot Incentive Compatible Multi-armed Bandit.
Supervisor: Prof. Erkki Oja, Prof. Alessandro Lazaric.

10/2008 - 12/2011 **M.Sc. in Mathematical Engineering**, *Politecnico di Milano, Dipartimento di Matematica*, Milano, Italy, 95/110.
Thesis: An Automated Mechanism Design Approach for Federated Search Engines.
Supervisor: Prof. Nicola Gatti.

09/2005 - 09/2008 **B.Sc. in Mathematical Engineering**, *Politecnico di Milano, Dipartimento di Matematica*, Milano, Italy, 105/110.
Thesis: Breve Introduzione alla Firma Digitale.
Supervisor: Prof. Alessandra Cherubini.

09/2000 - 07/2005 **Licenza di Liceo Scientifico**, *Liceo Scientifico e Classico E. Majorana*, Desio (Milano), Italy, 100/100.

List of Publications

- Journals
- [J8] F. Trovò, S. Paladino, M. Restelli, N. Gatti, "Sliding-Window Thompson Sampling for Non-Stationary Settings", *Journal of Artificial Intelligence Research*, AI Access Foundation, 2020, Volume 68, pp 311–364 (DOI: 10.1613/jair.1.11407).
 - [J7] A. Prelaj, C. Proto, G. Lo Russo, D. Signorelli, R. Ferrara, M. Mensah, G. Galli, A. De Toma, G. Viscardi, M. Brambilla, R. Lobefaro, B. Trevisan, F. Trovò, V. Torri, G. Sozzi, M.C. Garassino, M. Boeri, "Integrating clinical and biological prognostic biomarkers in patients with advanced NSCLC treated with immunotherapy: the DEMo score system", *Translational Lung Cancer Research*, AME Publishing Company, 2020, Volume 9(3), pp 617–628 (DOI: 10.21037/tlcr-20-231).
 - [J6] F. Trovò, S. Paladino, M. Restelli, N. Gatti, "Improving Multi-armed Bandit Algorithms in Online Pricing Settings", *International Journal of Approximate Reasoning*, Elsevier, 2018, Volume 98, pp 196–235 (DOI: 10.1016/j.ijar.2018.04.006).
 - [J5] M. Roveri, F. Trovò, "An Ensemble Approach for Cognitive Fault Detection and Isolation in Sensor Networks", *International Journal of Neural Systems*, World Scientific, 2017, Volume 27(3), pp 1–16 (DOI: 10.1142/S0129065716500477).
 - [J4] M.A. Cugueró-Escofet, J. Quevedo, C. Alippi, M. Roveri, V. Puig, D. García, F. Trovò, "Model-vs. Data-Based Approaches Applied to Fault Diagnosis in Potable Water Supply Networks", *Journal of Hydroinformatics*, 2016, IWA Publishing, Volume 18(5), pp 831–850 (DOI: 10.2166/hydro.2016.218).
 - [J3] N. Gatti, A. Lazaric, M. Rocco, F. Trovò, "Truthful Learning Mechanisms for Multi-Slot Sponsored Search Auctions with Externalities", *Artificial Intelligence*, Elsevier, 2015, Volume 227, pp 93–139 (DOI: 10.1016/j.artint.2015.05.012).
 - [J2] C. Alippi, M. Roveri, F. Trovò, "A Self-Building and Cluster-Based Cognitive Fault Diagnosis System for Sensor Networks", *IEEE Transactions on Neural Networks and Learning Systems*, 2014, Volume 25(64), pp 1021–1032 (DOI: 10.1109/TNNLS.2014.2303651).
 - [J1] A.A. Nacci, F. Trovò, F. Maggi, M. Ferroni, A. Cazzola, D. Sciuto, M.D. Santambrogio, "Adaptive and Flexible Smartphone Power Modeling", *Mobile Networks and Applications*, Springer US, 2013, Volume 18(5), pp 600–609 (DOI: 10.1007/s11036-013-0470-y).
- Conferences
- [C20] E. Vittori, M. Bernasconi de Luca, F. Trovò, M. Restelli, "Conservative Online Convex Optimization", *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD)*, 2021 (Accepted).

- [C19] G. Re, F. Chiusano, F. Trovò, D. Carrera, G. Boracchi, M. Restelli, “Exploiting History Data for Nonstationary Multi-armed Bandit”, European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD), 2021 (Accepted).
- [C18] E. Vittori, M. Bernasconi de Luca, F. Trovò, M. Restelli, “Dealing with Transaction Costs in Portfolio Optimization: Online Gradient Descent with Momentum”, ACM International Conference on Artificial Intelligence in Finance (ICAIF), 2020.
- [C17] A. Marchesi, F. Trovò, N. Gatti, “Learning Probably Approximately Correct Maximin Strategies in Simulation-Based Games with Infinite Strategy Spaces”, proceedings of the International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2020, pp 834–842 (DOI: 10.5555/3398761.3398860).
- [C16] A. Nuara, F. Trovò, D. Crippa, N. Gatti, M. Restelli, “Driving Exploration by Maximum Distribution in Gaussian Process Bandits”, proceedings of the International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2020, pp 948–956 (DOI: 10.5555/3398761.3398872).
- [C15] A. Nuara, N. Sosio, F. Trovò, M.C. Zaccardi, N. Gatti, M. Restelli, “Dealing with Interdependencies and Uncertainty in Multi-Channel Advertising Campaigns Optimization”, The Web Conference (WWW), 2019, pp 1376–1386 (DOI: 10.1145/3308558.3313470).
- [C14] A. Nuara, F. Trovò, N. Gatti, M. Restelli, “Online Joint Bid/Budget Optimization of Pay-per-click Advertising Campaigns”, European Conference on Multi-agent Systems (EUMAS), 2018.
- [C13] L. Bisi, G. De Nittis, F. Trovò, M. Restelli, N. Gatti, “Online Follower’s Behaviour Identification in Leadership Games”, European Conference on Multi-agent Systems (EUMAS), 2018.
- [C12] F. Trovò, S. Paladino, M. Restelli, N. Gatti, “Improving Multi-Armed Bandit Algorithms for Pricing”, European Conference on Multi-agent Systems (EUMAS), 2018.
- [C11] M. Gasparini, A. Nuara, F. Trovò, N. Gatti, M. Restelli, “Targeting Optimization for Internet Advertising by Learning from Logged Bandit Feedback”, proceedings of the International Joint Conference on Neural Networks (IJCNN), 2018, pp 1–8 (DOI: 10.1109/IJCNN.2018.8489092).
- [C10] A. Nuara, F. Trovò, N. Gatti, M. Restelli, “A Combinatorial-Bandit Algorithm for the Online Joint Bid/Budget Optimization of Pay-per-Click Advertising Campaigns”, proceedings of the Conference on Artificial Intelligence (AAAI), 2018, pp 2379–2386.
- [C9] L. Bisi, G. De Nittis, F. Trovò, M. Restelli, N. Gatti, “Regret Minimization Algorithms for the Follower’s Behaviour Identification in Leadership Games”, proceedings of the Conference on Uncertainty in Artificial Intelligence (UAI), 2017, pp 1–10.
- [C8] F. Trovò, S. Paladino, P. Simone, M. Restelli, N. Gatti, “Risk-averse Trees for Learning from Logged Bandit Feedback”, proceedings of the International Joint Conference on Neural Networks (IJCNN), 2017, pp 976–983 (DOI: 10.1109/IJCNN.2017.7965958).
- [C7] S. Paladino, F. Trovò, M. Restelli, N. Gatti, “Unimodal Thompson Sampling for Graph-Structured Arms”, proceedings of the Conference on Artificial Intelligence (AAAI), 2017, pp 2457–2463 (DOI: 10.5555/3298483.3298593).
- [C6] F. Trovò, S. Paladino, M. Restelli, N. Gatti, “Budgeted Multi-armed Bandit in Continuous Action Space”, proceedings of the European Conference on Artificial Intelligence (ECAI), 2016 (DOI: 10.3233/978-1-61499-672-9-560).
- [C5] M. Roveri, F. Trovò, “An Ensemble of HMMs for Cognitive Fault Detection in Distributed Sensor Networks”, proceedings of the International Conference on Artificial Intelligence Applications and Innovations (IAAI), 2014, 90–100 (DOI: 10.1007/978-3-662-44654-6_9).
- [C4] M. Ferroni, A. Cazzola, F. Trovò, D. Sciuto, M.D. Santambrogio, “On Power and Energy Consumption Modeling for Smart Mobile Devices”, proceedings of the IEEE International Conference on Embedded and Ubiquitous Computing (EUC), 2014 (DOI: 10.1109/EUC.2014.47).
- [C3] C. Alippi, M. Roveri, F. Trovò, “A Learning from Models Cognitive Fault Diagnosis System”, proceedings of the Artificial Neural Networks and Machine Learning (ICANN), 2012 (DOI: 10.1007/978-3-642-33266-1_38).
- [C2] N. Gatti, A. Lazaric, F. Trovò, “A Truthful Learning Mechanism for Multi-slot Sponsored Search Auctions with Externalities”, proceedings of the ACM Conference on Electronic Commerce (EC), 2012 (DOI: 10.1145/2229012.2229057).

[C1] N. Gatti, A. Lazaric, and F. Trovò, "A Truthful Learning Mechanism for Multi-slot Sponsored Search Auctions with Externalities", proceedings of the International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2012.

- Workshops and Symposia [W8] A. Prelaj, M. Boeri, A. Robuschi, C. Proto, G. Lo Russo, R. Ferrara, G. Galli, A. De Toma, M. Brambilla, M. Occhipinti, S. Manglaviti, A. Labianca, T. Beninato, M. Bini, M. Mensah, M. Ganzinelli, N. Zilembo, F. de Braud, G. Sozzi, M. Restelli, A. Pedrocchi, M.C. Garassino, F. Trovò "Artificial intelligence to improve selection for NSCLC patients treated with immunotherapy", Clinical Cancer Research (Abstract), 2021.
- [W7] A. Marchesi, F. Trovò, N. Gatti "Learning Maximin Strategies with Best Arm Identification Techniques", Games, Agents and Incentives Workshops (GAIW), 2020.
- [W6] A. Marchesi, F. Trovò, N. Gatti "Learning Maximin Strategies in Simulation-Based Games with Infinite Strategy Spaces", Smooth Games Optimization and Machine Learning Workshop (SGO&ML), 2019.
- [W5] A. Nuara, N. Sosio, F. Trovò, M.C. Zaccardi, N. Gatti, M. Restelli "IDIL: Exploiting Interdependence to Optimize Multi-Channel Advertising Campaigns", Games, Agents and Incentives Workshops (GAIW), 2019.
- [W4] G.M. Accabi, A. Nuara, F. Trovò, N. Gatti, M. Restelli "When Gaussian Processes Meet Combinatorial Bandits: GCB" European Workshop on Reinforcement Learning (EWRL), 2018.
- [W3] F. Trovò, S. Paladino, M. Restelli, N. Gatti, "Multi-armed Bandit for Pricing", European Workshop on Reinforcement Learning (EWRL), 2015.
- [W2] M. Roveri, F. Trovò, "Making Intelligent the Embedded Systems Through Cognitive Outlier and Fault Detection", proceedings of the Italian Workshop on Neural Networks (WIRN), 2015 (DOI: 10.1007/978-3-319-33747-0_38).
- [W1] C. Alippi, M. Roveri, F. Trovò, "Learning Causal Dependencies to Detect and Diagnose Faults in Sensor Networks", proceedings of the IEEE Symposium on Intelligent Embedded Systems (IES), 2014 (DOI: 10.1109/INTELES.2014.7008983).

- Other Publications [O3] G. De Nittis, F. Trovò, "Machine Learning Techniques for Stackelberg Security Games: a Survey", arXiv preprint arXiv:1609.09341, 2016.
- [O2] F. Trovò, "A Cognitive Fault Detection and Diagnosis System for Sensor Networks", Ph.D. Thesis, 2015.
- [O1] F. Trovò, "Automated Mechanism Design for Large Instances of Federate Search Engines", Politecnico di Milano, Dipartimento di Elettronica, Informazione e Bioingegneria, Milano, Italy, N 2012.37.

Technological Transfer

- 2020-Today **Co-founder of MLcube**, *Politecnico di Milano Spin-off company MLcube (www.mlcube.com), which aims at transferring AI cutting-edge methods to the industrial world.*

Teaching Activities

- 2020-Today **Lecturer of Online Learning and Monitoring**, *Ph.D. Course at Politecnico di Milano, Milano, Italy.*
In collaboration with Prof. G. Boracchi.
- 2018-Today **Lecturer of Informatica B**, *B.Sc. in Mechanical and Energy Engineering at Politecnico di Milano, Milano, Italy.*
- 2018-2020 **Lecturer of Intelligenza Artificiale**, *M.Sc. in Computer Science Engineering at Università degli Studi di Bergamo, Bergamo, Italy.*
- 2019-Today **Teaching assistant of Machine Learning for Networking**, *Passion in Action Course at Politecnico di Milano, Milano, Italy.*
Prof. C.A. Redondi.
- 2016-Today **Teaching Assistant of Machine Learning**, *M.Sc. in Computer Engineering and Mathematical Engineering at Politecnico di Milano, Milano, Italy.*
Prof. M. Restelli.

2014-2017 **Teaching Assistant of Informatica B**, *B.Sc. in Mechanical Engineering at Politecnico di Milano, Milano, Italy.*
Prof. G. Boracchi.

Honors, Grants and Scholarships

F.Ili Confaloneri Post-Doctoral Scholarship, 2016.

Referee Services

Journals Artificial Intelligence.
Journal of Artificial Intelligence Research.
IEEE Transactions on Neural Networks and Learning Systems.
IEEE Transactions on Emerging Topics in Computational Intelligence.
IEEE Computational Intelligence Magazine.
Adaptive Behavior.
Neural Networks.
Neural Computing and Applications.
Evolving Systems.
Frontiers in Oncology.

Conference Activities

Organizing Member Workflow Chair for AISTATS 2020, International Conference on Artificial Intelligence and Statistics.

Committee Member AISTATS 2021 (PC), International Conference on Artificial Intelligence and Statistics.
ICLR 2021 (PC), International Conference on Learning Representations.
NeurIPS 2020 – 2021 (PC), Conference on Neural Information Processing Systems.
AAMAS 2019 (PC), International Conference on Autonomous Agents and Multiagent Systems.
AAAI 2017 – 2021 (PC), Conference on Artificial Intelligence.
IJCAI 2017 – 2021 (PC), International Conference on Artificial Intelligence.
IJCNN 2017 – 2019 (PC), IEEE International Joint Conference on Neural Networks.
ICANN 2014 (TPC), International Conference on Artificial Neural Networks.

Referee EANN 2017 – 2019, International Conference on Engineering Applications of Neural Networks.
AAMAS 2016 – 2017, International Conference on Autonomous Agents and Multiagent Systems.
AAAI 2015, Conference on Artificial Intelligence.
ICAISC 2015, International Conference on Artificial Intelligence and Soft Computing.
IEEE SPICE 2015, International Conference on Signal Processing, Informatics, Communication and Energy Systems.
IJCNN 2014 – 2016, IEEE International Joint Conference on Neural Networks.
SSCI 2014, 2016, IEEE Symposium Series on Computational Intelligence.
ICANN 2014, 2017, International Conference on Artificial Neural Networks.
AIAI 2013 – 2014, 2018, International Conference on Artificial Intelligence Applications & Innovations.
CICIP 2013, International Conference on Intelligent Control and Information Processing.

Participation in Research Projects

11/2020 - Today **SunBurn**, *RSE S.p.A.*, (30K€ foundings).
Topic: Fault diagnosis for solar panel systems.
Role: Co-Project Leader, application of fault diagnosis methods to identify and isolate the faults occurring in a solar panel plant.
Co-Project Leader: Prof. Marcello Restelli.

- 11/2020 - Today **BEst 2, RSE S.p.A.**, (30K€ foundings).
 Topic: Estimation of lithium-ion batteries state of charge for smart energy systems.
 Role: Co-Project Leader, development of data-driven models to provide an accurate estimation of the battery degradation and to manage the battery usage profiles to slow down the battery ageing process.
 Co-Project Leader: Prof. Marcello Restelli.
- 11/2019 - 10 – 2020 **BEst, RSE S.p.A.**
 Topic: Estimation of lithium-ion batteries state of charge for smart energy systems.
 Role: Senior research scientist, development of data-driven models able to providing an accurate estimation of the current state of a lithium-ion battery, relying on the current and voltage measurements provided on the operational life of the battery.
 Project Leader: Prof. Marcello Restelli.
- 11/2019 - Today **HotelBid, AdHotel.**
 Topic: Development of an automatic bidding system for hotel advertisement.
 Role: Senior research scientist, coordinating the experimental activities and the development of the algorithms for automatic bidding and segmentation of the ad market.
 Project Leader: Prof. Nicola Gatti.
- 08/2019 - Today **ALGADIMAR, MIUR.**
 Topic: Development of new methods and tools in research areas that are critical to the understanding of digital markets.
 Role: Research scientist, design of novel algorithmic game theory and machine learning tools for optimization in strategic settings.
 Local Project Leader: Prof. Nicola Gatti.
- 10/2018 - 04/2021 **SHARP, DoveVivo.**
 Topic: Development of a pricing algorithm for long-term room rent.
 Role: Research scientist, development of a model able to providing a pricing strategy basing on the features of the rooms, the neighbourhood, and dealing whit seasonality effects.
 Project Leaders: Prof. Nicola Gatti, Prof. Marcello Restelli.
- 09/2018 - 08/2020 **Aero, Ferrari SpA.**
 Topic: Machine Learning Techniques for Aerodynamics Performance Optimization.
 Role: Research scientist (topic details are not disclosed due to NDA).
 Project Leaders: Prof. Marcello Restelli.
- 11/2016 - 10/2019 **Mediamatic, MMM Advertising.**
 Topic: Development of an algorithm for assisting the humans to design more efficient advertisement campaigns.
 Role: Research scientist, development of a user model able to capture the non-stationary nature of the phenomenon and application of reinforcement learning techniques to provide an approximated optimal planning of the campaign.
 Project Leaders: Prof. Nicola Gatti, Prof. Marcello Restelli.
- 10/2016 - 02/2020 **Total Efficiency 4.0, Regione Lombardia.**
 Topic: Development of a model to perform predictive maintenance in the context of smart manufacturing plants.
 Role: Research scientist, developing techniques and models suited for the data provided by the different units of the industrial process. Coordinating the master theses activities.
 Local Project Leader: Prof. Marcello Restelli.
- 11/2015 - 05/2017 **CyberFleet, Pirelli.**
 Topic: Development of a model to predict the pressure deflation for truck tyres, to improve the tyres maintenance schedules.
 Role: Research scientist, developing data preprocessing techniques and predictive models suited for the data provided by the available pressure sensors. Coordinating the master theses activities.
 Local Project Leader: Prof. Marcello Restelli.
- 04/2015 - 02/2019 **Methamatics, Lastminute.com.**
 Topic: Development of an algorithm for automatic pricing of flight tickets.
 Role: Research scientist, developing new multi-armed bandit algorithms able to exploit the characteristics of the pricing scenario and new clustering algorithm to improve the optimal price learning process.
 Project Leaders: Prof. Nicola Gatti, Prof. Marcello Restelli.
- 03/2013 - 08/2016 **Mpower.**
 Topic: Design and implementation of a system able to predict a mobile device Time To Live (TTL), able to provide the user with suggestions on the optimal device configuration w.r.t. the desired TTL.
 Role: Research scientist, developing new predictive models for energy consumption based on dynamic models (e.g., autoregressive with exogenous inputs). Coordinating the master theses activities.
 Project Leader: Prof. Marco Domenico Santambrogio.

01/2012 - 02/2014 **iSense (7th framework programme), EU.**

Topic: Development of intelligent data processing methods for fault diagnosis.

Role: Research scientist, investigating computational intelligence approaches and algorithms to detect and diagnose faults in critical application scenarios such as water distribution networks and environmental monitoring systems.

Local Project Leader: Prof. Cesare Alippi.

Talks

- Seminar “Explainable regression and Classification” at the Osservatorio AI technical webinar series, Online, June 2021.
- Seminar “From MAB to RL . . . and beyond!” at the AI meetup by MLModena, Online, January 2021
- Seminar “Explainable regression and Classification” at the Osservatorio AI technical workshop series, Online, September 2020.
 - Talk “Learning Probably Approximately Correct Maximin Strategies in Simulation-Based Games with Infinite Strategy Spaces” at the International Conference on Autonomous Agent and Multi-Agent Systems, Online, May 2020.
 - Talk “Driving Exploration by Maximum Distribution in Gaussian Process Bandits” at the International Conference on Autonomous Agent and Multi-Agent Systems, Online, May 2020.
 - Talk “Dealing with Interdependencies and Uncertainty in Multi-Channel Advertising Campaigns Optimization” at the Markets, Algorithms, Prediction and LEarning (MAPLE) workshop, the Politecnico di Milano, Milano (IT), September 2019.
 - Talk “Improving Multi-Armed Bandit Algorithms” at the European Conference on Multi-Agent Systems, the University of Bergen, Bergen (NO), November 2018.
 - Talk “Online Joint Bid/Budget Optimization of Pay-per-click Advertising Campaigns” at the European Conference on Multi-Agent Systems, the University of Bergen, Bergen (NO), November 2018.
 - Talk “Online Follower’s Behaviour Identification in Leadership Games” at the European Conference on Multi-Agent Systems, the University of Bergen, Bergen (NO), November 2018.
 - Talk “Online learning techniques for optimization of internet advertising campaigns” at the Permanent Itinerant Game Theory Seminars, the Politecnico di Milano, Milano (IT), November 2017.
- Seminar “Online Learning Techniques for Pricing in e-Commerce Scenarios” at the University of Edinburgh Agent Group Reading Group, the University of Edinburgh, Edinburgh (UK), November 2016.
- Demo “Fault Diagnosis in Environmental Monitoring demo” at the iSense final review meeting, STmicroelectronics, Agrate Brianza (Italy), February 2014.
 - Talk “MPower: Gain Back your Android Battery Life!”, Northeastern University, Boston, MA (USA), May 2013.
 - Talk “MPower: Gain Back your Android Battery Life!” at Bilateral research exchange between MIT (USA) and the Politecnico di Milano, MIT, Boston, MA (USA), May 2013.
 - Talk “Cognitive Fault Diagnosis Systems: Identification and Dictionary Creation” at Bilateral research exchange between MIT (USA) and the Politecnico di Milano, MIT, Boston, MA (USA), May 2013.
- Demo “Fault Diagnosis on iNemo Platform Demo” at the iSense review meeting, Universitat Politecnica de Catalunya, Barcelona (Spain), March 2013.
 - Talk “An Adapting, Model-free Fault Diagnosis Framework for Dynamic Systems” at the iSense 5th project meeting, STmicroelectronics, Agrate Brianza (Italy), October 2012.
 - Talk “A Learning from Models Cognitive Fault Diagnosis System” at the iSense 4th project meeting, The University of Birmingham, Birmingham (UK), May 2012.

Summer Schools

- Attended Online Learning Summer School, Copenhagen (Denmark), July 2015.

PhD Theses Supervision

- Co-Supervisor A. Nuara, “Machine learning algorithms for the optimization of internet advertising campaigns”, 2021.

Master Theses Supervision

- Supervisor A. Agostini, "Multi-armed bandit with persistent reward", 2021.
- G. Re, "REC-NS-MAB: an algorithm for Recurrent Concepts in Non-stationary Multi-armed Bandits", 2021.
- M. Bernasconi de Luca, "Online gradient descent for online portfolio optimization with transaction costs", 2020.
- Cosupervisor L. Casalini, "Algorithm to find the equilibrium point in missile-ship simulator-based game", Supervisor: Prof. N. Gatti, 2021.
- G.M. Gianola, "Development of machine learning algorithms for long-term room rentals pricing", Supervisor: Prof. N. Gatti, 2020.
- G. Spadaro, "Online bid optimization with return-on-investment constraints", Supervisor: Prof. N. Gatti, 2020.
- I. Battaini, "Price-advertising", Supervisor: Prof. N. Gatti, 2020.
- D. Crippa, "Exploiting maximum distribution to drive exploration in Gaussian process bandits", Supervisor: Prof. N. Gatti, 2020.
- M. Perfetto, "Ads content optimization for Internet advertising campaigns", Supervisor: Prof. N. Gatti, 2020.
- M. Maffioli, "Dealing with partial information in follower's behavior identification", Supervisor: Prof. M. Restelli, 2019.
- E. Kulatu, "Exploiting temporal dependencies to predict the revenue of flight tickets", Supervisor: Prof. M. Restelli, 2019.
- M. Mussi, "Improving aerodynamic load estimation algorithms for F1 racing cars, Supervisor: Prof. M. Restelli, 2019.
- G. Gregori, "Optimizing wind tunnel experiments to minimize the uncertainty of lapttime estimation for F1 cars", Supervisor: Prof. M. Restelli, 2019.
- A. Lavelli, "Feature selection for aerodynamic load estimation from pressure measurements for F1 racing cars", Supervisor: Prof. M. Restelli, 2019.
- A. Mongelluzzo, "A data-driven approach to detect faults in the tire building process", Supervisor: Prof. M. Restelli, 2019.
- L. Scannapieco, "Stochastic multi-armed bandit with switching costs : an empirical analysis", Supervisor: Prof. M. Restelli, 2018.
- M.C. Zaccardi, N. Sosio, "Exploiting channels interdependence in Internet advertising campaigns optimization", Supervisor: Prof. M. Restelli, 2018.
- F. Chiusano, "Breakpoint prediction for the abruptly-changing non-stationary multi-armed bandit problem", Supervisor: Prof. M. Restelli, 2018.
- N. Montali "Machine Learning approaches to increase production efficiency: an Industry 4.0 case", Supervisor: Prof. M. Restelli, 2018.
- M. Di Napoli, "Multi-asset trading with reinforcement learning : an application to magic the gathering online", Supervisor: Prof. M. Restelli, 2018.
- G.M. Accabi, "A bandit algorithm for the joint optimization of budgets in an online advertising context", Supervisor: Prof. M. Restelli, 2017.
- M. Gasparini, "Learning from logged bandit feedback techniques for targeting optimization of online advertising", Supervisor: Prof. N. Gatti, 2017.
- D. Pensa, "Integration of GPS data into predictive models for tyre maintenance", Supervisor: Prof. M. Restelli, 2017.
- G. Corradini, "Online Learning with Risk Averse Tree in Non-stationary Environments", Supervisor: Prof. M. Restelli, 2017.
- L. Bisi, "Regret minimization algorithms for the follower's behavior identification in leadership games", Supervisor: Prof. M. Restelli, 2017.
- E.M. Italia, "Optimization of digital advertising campaigns in non-stationary environments through a reinforcement learning algorithm", Supervisor: Prof. N. Gatti, 2017.
- A. Salmoiraghi, "Analysis of the cold start problem in predictive algorithms for cyber tyres", Supervisor: Prof. M. Restelli, 2017.

- F. Di Lorenzo, "Factored approaches for high dimensional multi-armed bandits", Supervisor: Prof. M. Restelli, 2017.
- D. Mapelli, D Enerli, "Bayesian learning for flight tickets pricing with performance-based bonus", Supervisor: Prof. M. Restelli, 2017.
- P. Simone, "Risk averse trees for learning from logged bandit feedback", Supervisor: Prof. M. Restelli, 2016.
- P. Fusari, F. Marocco, "A data-driven predictive model for tyre maintenance", Supervisor: Prof. M. Restelli, 2016.
- B. Kotevska, K Kosturanov, "Multi-armed bandit algorithms for pricing in e-commerce", Supervisor: Prof. N. Gatti, 2016.
- Z. Nechovski, "Estimation of costs and revenues based on online travel agencies' historical data", Supervisor: Prof. M. Restelli, 2016.
- A. Damiani, A Corna, "A scalable framework for resource consumption modelling: the MARC approach", Supervisor: Prof. M.D. Santambrogio, 2016.
- P. Serena, "ThermoSense: a complaint-based approach for thermal comfort control in indoor environments", Supervisor: Prof. M.D. Santambrogio, 2016.
- E. Gargano, M.A. Nosedà, "Pricing online di biglietti aerei: analisi strategica delle online travel agency in dominio metasearch", Supervisor: Prof. N. Gatti, 2015.
- A. Sgarro, "Exploiting monotonicity in continuum and multi armed bandit: the pricing scenario", Supervisor: Prof M. Restelli, 2015.
- G. Rumi, "Definizione e sviluppo di metodologie per la gestione dei consumi energetici nei dispositivi mobili", Supervisor: Prof. M.D. Santambrogio, 2015.
- A. Cazzola, "MModel : automatic generation of mobile devices power models based on user provided data", Supervisor: Prof. M.D. Santambrogio, 2014.
- M. Ferroni, A. Cazzola, "Mpower: on how to effectively predict the time to live for mobile devices", Supervisor: Prof. M.D. Santambrogio, 2013.