Giovanni Briglia - PhD Student in Causality-Driven RL

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Website Scholar GitHub LeetCode LinkedIn

Research Positions

Nov 2024 - present
PhD Student, National PhD in AI
University of Pisa || University of Modena and Reggio Emilia
Topic: Causality-Driven RL and MARL.
Supervisors: Franco Zambonelli and Stefano Mariani.

Jan 2025 - Feb 2025
PhD Researcher, Alan Turing Institute
Selected for the Data Study Group of January and February. I participated in the C-DICE challenge, developing an optimization framework for repurposing energy assets to support the UK's Net-Zero 2050 goal.

Nov 2023 - Nov 2024
Research Fellow, Distributed and Pervasive Intelligence Group
Topic: Causality-Driven RL.
Supervisors: Franco Zambonelli and Stefano Mariani.

Education

Nov 2024 – present
PhD Computer Science, University of Pisa
Topic: Causality-Driven RL and MARL.
Courses: Markov Processes, Stochastic Processes, Game Theory, Evolutionary Game Theory, Distributed AI, Introduction to LLMs and Applied Econometrics.
Supervisors: Franco Zambonelli and Stefano Mariani.

Sep 2021 – Oct 2023
M.Sc. Mechatronics, Robotics and Automation Engineering, University of Modena and Reggio Emilia, Grade: 110 with honors/110.
Thesis title: Integrating Causality into Q-Learning for Adaptive Control in Dynamic Environments. Supervisor: Marco Lippi

Oct 2022 – Mar 2023
Erasmus+ exchange semester, Technische Universität München (TUM)
Courses: Embedded Network Systems, Concept and Software Design for CPS, Experimental Vibration Analysis, Visual Data Analytics, Robotics.

Sep 2018 – Oct 2021
B.Sc. Mechatronics, Robotics and Automation Engineering, University of Modena and Reggio Emilia, Grade: 96/110.
Thesis title: Artificial Intelligence applied to predictive maintenance.
Supervisor: Marco Lippi

Partecipation to Research Projects

Feb 2024 - Nov 2024
AGRARIAN: this project aims to create an advanced agricultural solution focused on utilizing both drones and rovers to gather images and data for analyzing vineyards, specifically targeting the detection of golden flavescence.
Supervisors: Marco Lippi and Stefania Monica.

Mar 2021 - Aug 2023
ProjectRED: transitioned from a member to leader within the Mechanical Division and R&D, driving innovation and team management across significant projects. Developed the electronic case and machine learning applications for a new semi-adaptive suspension system. Led a team of 15 in rover assembly and technical documentation. Spearheaded the development of an autonomous robotic system for rover localization and mapping in unknown environments, using advanced technologies such as YOLOv5, homography, and SLAM.

Research Publications

Journal Articles

1. G. Briglia, F. Immovilli, M. Cocconcelli, and M. Lippi, "Bearing fault detection and recognition from supply currents with decision trees," *IEEE Access*, 2023.

Conference Proceedings

1. G. Briglia, M. Lippi, S. Mariani, and F. Zambonelli, "Improving reinforcement learning-based autonomous agents with causal models," in *International Conference on Principles and Practice of Multi-Agent Systems*, Springer, 2024, pp. 267–283.
2. G. Briglia, F. Immovilli, M. Cocconcelli, and M. Lippi, "Cross-load generalization of bearing fault recognition with decision trees," in *2023 7th International Conference on System Reliability and Safety (ICSRS)*, IEEE, 2023, pp. 400–406.

Pre-prints

1. G. Briglia, S. Mariani, and F. Zambonelli, *A roadmap towards improving multi-agent reinforcement learning with causal discovery and inference*, arXiv preprint arXiv:2503.17803, 2025.

In progress

1. G. Briglia, F. Zambonelli, and S. Mariani, "A taxonomy for causal reinforcement learning," IEEE TAI.
2. G. Briglia, F. Zambonelli, and S. Mariani, "Continuous bayesian networks: An efficient and scalable approach," ECAI 2025.
3. M. Catellani, G. Briglia, M. Mantovani, L. Sabattini, F. Zambonelli, and S. Mariani, "Efficient distributed coverage control through deep reinforcement learning," AAAI 2026.
4. F. Fabiano and G. Briglia, "Augmented epistemic planning through monte carlo tree search," AAAI 2026.

Summer Schools

Mar 2025	**`Learning Over Time`** `@National Phd on AI`
July 2024	**`OxML Representation Learning and Generative AI`** @University of Oxford
May 2024	**`OxML Fundamentals`** @University of Oxford
Sep 2022	**`Advanced Course in AI`** `@AImageLab`

Skills

Languages	Italian mother tongue and fluent in English
Coding	Python C, C++, Matlab
Python Libraries	torch, tensorflow, scikit-Learn, pandas, numpy, scipy
RL Libraries	stable-baselines3, cleanrl, minimalRL, RLLib, torchrl
Causality Libraries	causalnex, pgmpy, CausalML, EconML, gCastle, do-why, causal-learn, causallib
Distributed Systems	multi-threaded/processing design, parallel/distributed computing
Version Control	GitHub, Git-Lab, CI/CD
Operating Systems	Windows, Linux
Misc.	Academic research, teaching, training, consultation, Office, LaTeX

Miscellaneous Experience

Awards and Achievements

2024 **OxML 2024 partial scholarship**, University of Oxford

2023 **Best 20 recent graduates in Italy in the engineering area**, `AlmaLaurea`.

Certifications

2024 **`Reinforcement Learning Specialization`**, University of Alberta.

2023 **`Deep Learning Specialization`**, DeepLearning.AI.

`Game Theory`, Stanford Online.

2022 **`Crash Course on Python`**, Google.

2021 **English Language Certification: B2**, Trinity College of London.

Reviewing

2024 **IEEE Transactions on Industrial Informatics**

Others

Nov 2023 - present **TechSportTrackAnalysis**, *by me and colleague*: development of a social network based on amateur sports statistics obtained from video footage of matches. The core of the system is a set of AI algorithms refined ad-hoc for the purpose.

Jan 2018 - Feb 2018 **PLC software developer,** `Elettric80`.
School-work experience, PLC department.

I authorize the processing of personal data contained in my curriculum vitae on the basis of Legislative Decree 196/2003, coordinated with Legislative Decree 101/2018, and EU Regulation 2016/679.