Antonio Balordi

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About me

I'm A PhD candidate specializing in the intersection of AI safety and trustworthy machine learning. My primary research focuses on developing principled and efficient Federated Unlearning frameworks to address the "Right to Be Forgotten" in decentralized AI systems. I design novel algorithms that leverage information-theoretic principles for targeted data removal, ensuring both privacy compliance and model utility. My secondary research area, conducted with the Models and Data Laboratory (MADLab) in Milano Bicocca, focuses on the practical application of Bayesian Networks for robust decision support in medical contexts. My goal is to advance the state-of-the-art in creating auditable and reliable AI systems suitable for high-stakes, regulated environments.

Education & Training

PhD in Defence and Security Studies - XL Cycle | CASD - Italian Defense University | 01/11/2024 - Current | Rome, Italy

Major: Artificial Intelligence and Cybersecurity

PhD Visiting Student | Scuola IMT Alti Studi Lucca | 01/09/2025 - Current | Lucca, Italy

A visiting period at IMT to meet Prof. Gabriele Costa and pursue potential collaborative research on unlearning.

Erasmus+ Visiting Student | University of Almeria (UAL) | 01/01/2024 - 30/06/2024 | Almeria, Spain

Conducted a semester-long research project as a core component of my Master's thesis. Collaborated with Prof. Antonio Salmerón on the topic of Bayesian Networks applied to the triaging of an Emergency Room.

MSc Artificial Intelligence for Science and Technology | University of Milano Bicocca | 01/09/2022 - 31/07/2024 | Milan, Italy

Major: Quantum Technology and Complex Systems.

Final grade: Cum Laude | **Thesis:** Bayesian Networks for Causal Analysis in Triage Decision Support

BSc Physics | University of Milano Bicocca | 01/09/2018 - 30/09/2022 | Milan, Italy

Thesis: Variational AutoEncoders for anomaly detection of VBS processes at the LHC

Work experience

University Tutor | University of Milano Bicocca - UNIMIB | 01/01/2024 - 31/12/2025 | Milan, Italy

Provided academic support and tutoring to graduate students during laboratory sessions for the course 'Unsupervised Learning,' within the Master of Science in Artificial Intelligence for Science and Technology.

Publications

Tackling Federated Unlearning as a Parameter Estimation Problem

Antonio Balordi, Lorenzo Manini, Fabio Stella, Alessio Merlo (2025).

https://arxiv.org/abs/2508.19065

Doctoral Consortium

Antonio Balordi (2025). ECAI

Accepted for presentation

https://ecai25doctoralconsortium.github.io/program.html

Patient's Privacy vs. Public Health: Can AI Solve the Hippocratic Dilemma?

Antonio Balordi, Alice Bernasconi, Alessio Merlo (2025). ECAI Workshop HC@AIxIA + HYDRA 2025

Accepted for presentation

When ‘Scarce’ Becomes ‘Too Scarce’: The Rare Diseases Drama

Alice Bernasconi, Federico Pirola, Alessio Zanga, Antonio Balordi (2025). ECAI Workshop HC@AIxIA + HYDRA 2025

Accepted for presentation

On Counterfactual Explanations of Cardiovascular Risk in Adolescent and Young Adult Breast Cancer Survivors

Alice Bernasconi, Antonio Balordi, Rafael Cabanas De Paz, Alessio Zanga (2024).

HC@AIxIA 2024: 3rd AIxIA Workshop on Artificial Intelligence For Healthcare

https://ceur-ws.org/Vol-3880/paper19.pdf

Conferences & Seminars

NATO CA2X2 (Computer Assisted Analysis, Exercise, Experimentation) Forum | 23/09/2025 - 25/09/2025 | Rome

Poster presentation

PhD Summer School on Secure Software Development: From Design to Implementation | 08/09/2025 - 12/09/2025 | San Servolo (VE)

Serics Academy Summer School

PhD Summer School on Cybersecurity and International Relations | 30/06/2025 - 04/07/2025 | Genoa

Serics Academy Summer School

Projects

Volunteer EMT - Italian Red Cross | 01/01/2018 - Current

Student Representative - University of Milano Bicocca | 01/01/2023 - 31/12/2024