

Alberto Marfoggia

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GitHub: [Portfolio](#)

Google Scholar: [link](#)

Education and awards

PhD in Computer Science and Engineering, University of Bologna 2023 – Present

- Research focus: trustworthy AI, clinical data harmonization, and patient trajectory prediction
- Best Workshop Paper (DIGITA 2025) at the 23rd IEEE PerCom International Conference

Master's Degree in Computer Science and Engineering, University of Bologna 2020 – 2023

- Final grade: 110/110 cum laude, grade average: 29.8/30

Bachelor's Degree in Computer Science and Engineering, University of Bologna 2017 – 2020

- Final grade: 110/110 cum laude, grade average: 28.5/30
- University Prize for early graduation with top honors

Experience

Visiting PhD Researcher, Inria, ParisSaclay Campus, France (8 months) 2025 - Present

- Develop outcome prediction models using graph convolutional networks and knowledge graph representations
- Evaluate how different clinical data models, including FHIR, affect predictive performance and robustness
- Investigate explainability methods for graph-based and clinical AI systems

Seminar Instructor, University of Bologna 2023 - Present

- Deliver seminars on semantic technologies, healthcare interoperability, and digital health architecture
- Provide technical training on FSE 2.0 and healthcare standards to regional stakeholders
- Teach IoT and Industry 4.0 topics within professional training programs

Topic Coordinator, Frontiers in Digital Health 2024 - 2025

- Defined the scope and editorial direction of a special issue on digital twins in healthcare
- Coordinated manuscript peer review and interdisciplinary collaboration

ICT Research Consultant, University of Bologna (1 month) 2025

- Built a reproducible local testing infrastructure for AlmaHealthDB
- Implemented role-based access and security measures for collaborative research use

Research Fellow, University of Bologna (6 months) 2023

- Designed and implemented a FHIR-based data conversion pipeline for heterogeneous healthcare data
- Contributed to data-lake design, server configuration, and preprocessing workflows

GenAI Research Engineer, MEBLabs, Fano, Italy (4 months) 2023

- Researched LLMs, vector databases, and retrieval-augmented generation workflows
- Built semantic search prototypes using the OpenAI API and deployed them on AWS

Research Scholarship Holder, I-Tel S.r.l., Cattolica, Italy (4 months) 2020 - 2021

- Developed a microservice-based interoperability platform for healthcare systems
- Implemented a hexagonal architecture integrating HL7, FHIR, REST, and legacy healthcare protocols

Skills

Languages: Italian (native), English (C1), French (A2)

Technical: Machine Learning, Explainable AI, Graph Learning, Knowledge Graphs, Semantic Web, HL7 FHIR, OMOP, openEHR, Software Architecture, Python, Java, Scala, C, JavaScript, SQL, Docker, Git, CI/CD, AWS, HPC, LLM

Publications: 6 peer-reviewed high-ranked journal articles and 6+ conference papers

Journal Publications

- [1] Marfoggia, A., Arcobelli, V., Moscato, S., La Mattina, A. A., Mellone, S., & Carbonaro, A. (2026). Challenges of health data standard adoption and usage: a systematic review. *Journal of Biomedical Informatics*, 178, 1–21. DOI: <https://doi.org/10.1016/j.jbi.2026.105022>
- [2] Marfoggia, A., D’Errico, C., Mellone, S., & Carbonaro, A. (2026). A knowledge graph-driven framework for deploying Alpowered patient digital twins. *Future Generation Computer Systems*, 180, Article 108380, 1–12. DOI: <https://doi.org/10.1016/j.future.2026.108380>
- [3] Marfoggia, A., Nardini, F., Arcobelli, V. A., Moscato, S., Mellone, S., & Carbonaro, A. (2025). Towards real-world clinical data standardization: A modular FHIR-driven transformation pipeline to enhance semantic interoperability in healthcare. *Computers in Biology and Medicine*, 187, Article 109745, 1–11. DOI: <https://doi.org/10.1016/j.compbimed.2025.109745>
- [4] Carbonaro, A., Marfoggia, A., Quaranta, L., Mellone, S., & Lanubile, F. (2025). Editorial: Implementing digital twins in healthcare: pathways to person-centric solutions. *Frontiers in Digital Health*, 7, 1–3. DOI: <https://doi.org/10.3389/fdgth.2025.1741466>
- [5] Arcobelli, V. A., Moscato, S., Palumbo, P., Marfoggia, A., Nardini, F., Randi, P., Davalli, A., Carbonaro, A., Chiari, L., & Mellone, S. (2024). FHIR-standardized data collection on the clinical rehabilitation pathway of trans-femoral amputation patients. *Scientific Data*, 11, Article 806, 1–14. DOI: <https://doi.org/10.1038/s41597-024-03593-6>
- [6] Carbonaro, A., Marfoggia, A., Nardini, F., & Mellone, S. (2023). CONNECTED: leveraging digital twins and personal knowledge graphs in healthcare digitalization. *Frontiers in Digital Health*, 5, Article 1322428, 1–6. DOI: <https://dx.doi.org/10.3389/fdgth.2023.1322428>

Conference Proceedings & Workshops

- [7] Marfoggia, A., Jhee, J. H., & Coulet, A. (2026). Clinical Data Goes MEDS? Let’s OWL make sense of it. arXiv preprint arXiv:2601.04164. Accepted at the SWAT4HCLS Conference. DOI: <https://doi.org/10.48550/arXiv.2601.04164>
- [8] Marfoggia, A., Robustelli, A., D’Errico, C., Mellone, S., & Carbonaro, A. (2025). A LLMOps-Driven Framework for Clinical Data Harmonization. In *Machine Learning Operations 2025 (MLOps25)*, CEUR Workshop Proceedings, pp. 25–36. Paper: <https://ceur-ws.org/Vol-4109/paper3.pdf>
- [9] Robustelli, A., Marfoggia, A., D’Errico, C., Mellone, S., & Carbonaro, A. (2025). Feasibility of MLOps-based healthcare pipelines in ensuring the Cybersecurity Framework. In *Machine Learning Operations 2025 (MLOps25)*, CEUR Workshop Proceedings, pp. 1–12. Paper: <https://ceur-ws.org/Vol-4109/paper1.pdf>
- [10] Marfoggia, A., D’Errico, C., Nardini, F., Mellone, S., & Carbonaro, A. (2025). CONNECTED: A Knowledge Graph-Driven Platform for Clinical Data Harmonization and Personalized Digital Twin-Based Healthcare. In *2025 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops 2025)*, pp. 116–121, Washington, DC, USA. DOI: <https://doi.org/10.1109/PerComWorkshops65533.2025.00051>
- [11] Marfoggia, A., Nardini, F., Mellone, S., & Carbonaro, A. (2024). Representation of Machine Learning Models to Enhance Simulation Capabilities Within Digital Twins in Personalized Healthcare. In *2024 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops 2024)*, pp. 1–7, Biarritz, France. DOI: <https://doi.org/10.1109/PerComWorkshops59983.2024.10502444>
- [12] Arcobelli, V. A., Moscato, S., Marfoggia, A., Nardini, F., Randi, P., Davalli, A., Carbonaro, A., Palumbo, P., Chiari, L., & Mellone, S. (2023). MOTU on FHIR: A preliminary strategy to enable interoperability for retrospective dataset standardization. In *2023 IEEE EMBS Special Topic Conference on Data Science and Engineering in Healthcare, Medicine and Biology*, pp. 81–82, St. Julians, Malta. DOI: <https://doi.org/10.1109/IEEECONF58974.2023.10404816>