

Andrea Cini, Ph.D.

Postdoc Researcher

SNSF Postdoc Fellow
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Research interests

My research focuses on machine learning methods for processing **time series** and **graph-structured data**. Applications are in time series analysis and **forecasting**, with a focus on **energy analytics** and **biomedical signal processing**. I am also broadly interested in the use of machine learning methods to accelerate scientific discovery and engineering.

Academic positions

- Feb 2025 – present **SNSF Postdoc Fellow**, *Department of Computer Science, University of Oxford, Oxford, United Kingdom*, Advisor: Prof. **Michael Bronstein**
 - PI of SNSF Postdoc.Mobility grant: *Relational Deep Learning for Reliable Time Series Forecasting at Scale* (personal grant)
 - Time series and graph processing
- Feb 2025 – present **Postdoctoral affiliate**, *Department of Mathematics and Statistics, UiT The Arctic University of Norway, Tromsø, Norway*, Advisor: Prof. **Filippo Maria Bianchi**
- Feb 2025 – present **Postdoctoral affiliate**, *The Swiss AI Lab IDSIA USI-SUPSI, Università della Svizzera italiana, Lugano, Switzerland*
- Aug 2024 – **Postdoc researcher**, *The Swiss AI Lab IDSIA USI-SUPSI, Università della Svizzera italiana, Lugano, Switzerland*, Advisor: Prof. **Cesare Alippi**
 - Time series analysis
 - Graph processing
- Mar 2023 – **Visiting PhD student**, *Department of Electrical and Electronic Engineering, Imperial College London, London, United Kingdom*, Host: Prof. **Danilo Mandic**
 - Graph-based hierarchical forecasting
 - Biomedical signal processing.
- 2019–2024 **PhD student**, *The Swiss AI Lab IDSIA USI-SUPSI, Università della Svizzera italiana, Lugano, Switzerland*, Advisor: Prof. **Cesare Alippi**
 - Time series and graph processing
 - Graph deep learning
- 2019–2024 **Teaching assistant and lecturer**, *Università della Svizzera italiana, Lugano, Switzerland*
 - Designing and delivering lectures and tutorials.
 - Student assessment and supervision.

Industry Positions

- 2018–2019 **R&D Machine Learning Engineer**, *Argotec*, Turin, Italy
Working on research-oriented Machine Learning projects for aerospace applications.
- Reinforcement learning for satellite attitude control.
 - Applied computer vision.

Education

- 2019–2024 **PhD in Informatics**, *The Swiss AI Lab IDSIA USI-SUPSI, Università della Svizzera italiana*, Lugano, Switzerland, Advisor: Prof. **Cesare Alippi**
- Note of distinction from the PhD reviewing committee.
- 2016–2018 **MSc in Computer Science and Engineering**, *Politecnico di Milano*, Milan, Italy, Final grade: 110/110 cum Laude, GPA: 29.3/30
- 2013–2016 **BSc in Computer Science and Engineering**, *Politecnico di Milano*, Milan, Italy, Final grade: 110/110, GPA: 28.3/30

Teaching

Courses

- 2022 **Graph Deep Learning**, *MSc, USI*, Teaching assistant and lecturer, Director: Prof. Alippi
- 2020–2024 **Advanced Topics in Machine Learning**, *MSc, USI*, Teaching assistant and lecturer, Director: Prof. Alippi
- 2020,2021 **Machine Learning**, *BSc & MSc, USI*, Teaching assistant and lecturer, Director: Prof. Alippi
- 2019 **Software Performance**, *MSc, USI*, Teaching assistant, Director: Prof. Hauswirth

Supervision

- 2024– (ongoing) **Valentina Moretti**, *PhD @ USI*, Research co-supervision. Valentina is working on time series forecasting and learning in non-stationary environments
- 2022– (ongoing) **Tommaso Marzi**, *PhD @ USI*, Research co-supervision. Tommaso is working on graph-based representations for reinforcement learning

Thesis Supervisor

- 2023–2024 **Valentina Moretti**, *MSc @ Politecnico di Milano*, Thesis: State Initialization in Recurrent Neural Networks, PhD student at USI
- 2022 **Arshjot Khehra**, *MSc @ USI*, Thesis: Hierarchical Graph Reinforcement Learning, Data Scientist at Swiss Data Science Center
- 2022 **Simone Eandi**, *MSc @ USI*, Thesis: Spatio-Temporal Graph Neural Networks for aggregate load forecasting, Machine Learning Engineer at Intesa
- 2022 **Hritik Roy**, *MSc @ USI*, Thesis: Geometric Aspects of Reinforcement Learning, PhD student at Technical University of Denmark

- 2020 **Gabriel Carraretto**, *BSc @ USI*, Thesis: Graph Representations for Skeleton-based Action Recognition, MSc student at USI
- 2019 **Gloria Sassone**, *BSc @ USI*, Thesis: Exploiting AI for automatic gender stereotypes detection in Disney movies, MSc student at USI

Research collaborations

- 2025–
(ongoing) I am collaborating with Prof. **Michael Bronstein** and his team at the **University of Oxford** as part of my SNSF project, *Relational Deep Learning for Reliable Time Series Forecasting at Scale*, for which the University of Oxford serves as the host institution. The project focuses on the design of scalable and reliable *relational time series processing* methods.
- 2023–
(ongoing) I am collaborating with Prof. **Danilo Mandic** and Dr. **Fu Siong Ng** and their teams at **Imperial College London** on the application of *graph deep learning* to the analysis and processing of *biomedical signals*. The collaboration has already led to a patent application.
- 2022–
(ongoing) I am collaborating with Prof. **Filippo Maria Bianchi** and his team at **UiT The Arctic University of Norway**. The collaboration with Prof. Bianchi focuses on *time series forecasting*, *uncertainty quantification*, and graph deep learning for *energy analytics*. Prof. Bianchi is a collaborator on my postdoctoral SNSF project and as a result of the collaboration I have been recognized as a postdoctoral affiliate at UiT.
- 2019–
(ongoing) I completed my doctoral studies at the Graph Machine Learning Group (GMLG), within the Swiss AI lab IDSIA USI-SUPSI, at **Università della Svizzera italiana (USI)**, working under the supervision of Prof. **Cesare Alippi**. My research at GMLG focused on *graph-based methods for time series processing*. After the PhD, I was a postdoctoral researcher at USI for 6 months and I am currently recognized as a postdoctoral affiliate in the scope of ongoing collaborations. My role at GMLG also involves the supervision of MSc and PhD students.
- 2019–2021 I collaborated with Prof. **Carlo D’Eramo** on bias correction in *reinforcement learning* while he was at **TU Darmstadt** in the group lead by Prof. **Jan Peters**.

Talks

Seminars and invited talks

- 2025 **McGill University**, *Graph Deep Learning for Time Series Processing*, Invited to deliver a lecture on spatiotemporal graphs to Prof. Reihaneh Rabbany’s Temporal Graph Learning class at McGill University
- 2024 **Temporal Graph Learning Reading Group**, *Graph Deep Learning for Time Series Processing*, Invited to present my research on graph-based time series processing
- 2024 **Oxford Networks and Society Group**, *Graph Deep Learning for Time Series Forecasting*, Held a seminar to Prof. Xiowen Dong’s group at the University of Oxford
- 2023 **Temporal Graph Learning Reading Group**, *Scalable Spatiotemporal Graph Neural Networks*, Invited to present my work on scalable graph-based predictors

2022 **Baker Hughes**, *Graph Deep Learning for Time Series Imputation*, Invited to give a seminar about my work on time series imputation to the AI team of Baker Hughes

2022 **TU Dresden**, *Deep Reinforcement Learning with Weighted Q-Learning*, Invited to talk about my work at the Conference on Reinforcement Learning at TU Dresden

Tutorials

2024 **Graph Deep Learning for Time Series Processing**, *Tutorial on graph deep learning for time series at the Italian LoG-meetup in Siena*, <https://sites.google.com/student.unisi.it/log24siena/home-page>

2024 **Graph Deep Learning for Time Series Processing**, *Organized tutorial on graph deep learning for time series processing at LoG 2024*, <https://gmlg.ch/tutorials/graph-based-processing/log-2024>

2023 **Graph Deep Learning for Spatiotemporal Time Series**, *Organized tutorial on graph deep learning for time series processing at ECML PKDD 2023*, <https://gmlg.ch/tutorials/graph-based-processing/ecml-2023>

Paper presentations

I have presented several papers at international conferences (ICML, NeurIPS, ICLR, AAAI, etc.) and workshops (see **publication list**).

Best paper awards

2022 **Scalable Spatiotemporal Graph Neural Networks**, *TGL @ NeurIPS 22*, Best paper award at Temporal Graph Learning Workshop at NeurIPS 2022

Research Grants

2023 **SNSF postdoc fellowship**, *Swiss National Science Foundation*, Grant for an independent 2-year research project at the University of Oxford (**PI, 132.6K CHF**)

2023 **Doctoral mobility grant**, *Università della Svizzera italiana*, Grant for 6 months of doctoral mobility to investigate graph-based spatiotemporal forecasting at Imperial College London (**PI, 18.5K CHF**)

Service

Area chair

2024 Learning on Graphs Conference (LOG)

Reviewer/Program committee member

Journals Journal of Machine Learning Research (JMLR), IEEE Transactions on Neural Networks (TNNLS), IEEE Transactions on Artificial Intelligence (TAI), Neural Networks

Conferences Advances in Neural Information Processing Systems (NeurIPS), International Conference on Machine Learning (ICML), International Conference on Learning Representations (ICLR), AAAI Conference on Artificial Intelligence (AAAI), Learning on Graphs Conference (LOG), International Joint Conference on Neural Networks (IJCNN), European Symposium on Artificial Neural Networks (ESANN)

Other awards

- 2023 **Top reviewer**, *Advances in Neural Information Processing Systems (NeurIPS)*, Selected among the best reviewers for NeurIPS 2023.
- 2023 **Travel grant**, Travel award to attend the NeurIPS conference in New Orleans (US)
- 2022 **Travel grant**, Travel award to attend the RLDM 2022 conference in Providence (US)
- 2013–2018 **Scholarship**, *Politecnico di Milano*, Reduced tuition for high merits
- 2013 **Scholarship**, *Liceo Scientifico Giovanni da Castiglione*, Scholarship awarded to the best high-school graduate

Open-source projects

- 2022 **Torch Spatiotemporal**, <https://github.com/TorchSpatiotemporal/ts1>, A PyTorch library built to accelerate research on neural spatiotemporal data processing methods, with a focus on Graph Neural Networks, Lead developer

Publications list

Google Scholar: **502 citations, h-index 12** (10 February 2025)

Preprints

- [1] **A. Cini**, I. Marisca, D. Zambon, and C. Alippi. “Graph Deep Learning for Time Series Forecasting”. In: *arXiv preprint arXiv:2310.15978* (2023).
- [2] D. Zambon, **A. Cini**, L. Livi, and C. Alippi. “Graph state-space models”. In: *arXiv preprint arXiv:2301.01741* (2023).

Conference Papers

- [3] **A. Cini**, D. Mandic, and C. Alippi. “Graph-based Time Series Clustering for End-to-End Hierarchical Forecasting”. In: *International Conference on Machine Learning* (2024).
- [4] G. De Felice, **A. Cini**, D. Zambon, V. Gusev, and C. Alippi. “Graph-based Virtual Sensing from Sparse and Partial Multivariate Observations”. In: *International Conference on Learning Representations*. 2024.
- [5] **A. Cini**, I. Marisca, F. M. Bianchi, and C. Alippi. “Scalable Spatiotemporal Graph Neural Networks”. In: *Proceedings of the AAAI Conference on Artificial Intelligence* (2023).
- [6] **A. Cini**, I. Marisca, D. Zambon, and C. Alippi. “Taming Local Effects in Graph-based Spatiotemporal Forecasting”. In: *Advances in Neural Information Processing Systems (NeurIPS)* (2023).
- [7] **A. Cini**, C. D’Eramo, J. Peters, and C. Alippi. “Deep reinforcement learning with weighted Q-Learning”. In: *The Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM)* (2022).
- [8] **A. Cini**, I. Marisca, and C. Alippi. “Filling the Gaps: Multivariate Time Series Imputation by Graph Neural Networks”. In: *International Conference on Learning Representations (ICLR)* (2022).

- [9] S. Eandi, **A. Cini**, S. Lukovic, and C. Alippi. "Spatio-Temporal Graph Neural Networks for Aggregate Load Forecasting". In: *2022 International Joint Conference on Neural Networks (IJCNN)*. IEEE. 2022, pp. 1–8.
- [10] I. Marisca, **A. Cini**, and C. Alippi. "Learning to Reconstruct Missing Data from Spatiotemporal Graphs with Sparse Observations". In: *Advances in Neural Information Processing Systems (NeurIPS) (2022)*.
- [11] **A. Cini**, S. Lukovic, and C. Alippi. "Cluster-based aggregate load forecasting with deep neural networks". In: *2020 International Joint Conference on Neural Networks (IJCNN)*. IEEE. 2020, pp. 1–8.
- [12] **A. Cini**, M. E. Hariry, and A. Balossino. "Neural Attitude Control: Nanosatellite attitude control with Deep Reinforcement Learning". In: *Interplanetary CubeSat Workshop (iCubeSat)*. 2019.
- [13] C. D'Eramo, **A. Cini**, and M. Restelli. "Exploiting Action-Value Uncertainty to drive Exploration in Reinforcement Learning". In: *International Joint Conference on Neural Networks (IJCNN)*. 2019.

Journal Papers

- [14] L. Butera, G. D. Felice, **A. Cini**, and C. Alippi. "On the Regularization of Learnable Embeddings for Time Series Forecasting". In: *Transactions on Machine Learning Research* (2025). ISSN: 2835-8856. URL: <https://openreview.net/forum?id=F5ALCh3GWG>.
- [15] L. Butera, **A. Cini**, A. Ferrante, and C. Alippi. "Object-Centric Relational Representations for Image Generation". In: *Transactions on Machine Learning Research* (2024). ISSN: 2835-8856. URL: <https://openreview.net/forum?id=7kWjB9zW90>.
- [16] T. Marzi, A. S. Khehra, **A. Cini**, and C. Alippi. "Feudal Graph Reinforcement Learning". In: *Transactions on Machine Learning Research* (2024). ISSN: 2835-8856. URL: <https://openreview.net/forum?id=wFcyJTik90>.
- [17] **A. Cini**, D. Zambon, and C. Alippi. "Sparse Graph Learning from Spatiotemporal Time Series". In: *Journal of Machine Learning Research* 24.242 (2023), pp. 1–36.
- [18] N. A. Efkarpidis, S. Imoscopi, M. Geidl, **A. Cini**, S. Lukovic, C. Alippi, and I. Herbst. "Peak shaving in distribution networks using stationary energy storage systems: A Swiss case study". In: *Sustainable Energy, Grids and Networks* 34 (2023), p. 101018.
- [19] L. Ferretti, **A. Cini**, G. Zacharopoulos, C. Alippi, and L. Pozzi. "Graph Neural Networks for High-Level Synthesis Design Space Exploration". In: *ACM Transactions on Design Automation of Electronic Systems* (2022).
- [20] C. D'Eramo, **A. Cini**, A. Nuara, M. Pirotta, C. Alippi, J. Peters, and M. Restelli. "Gaussian Approximation for Bias Reduction in Q-Learning". In: *Journal of Machine Learning Research* 22 (2021), pp. 1–51.