

Veronica Lachi

10/10/2025

PERSONAL INFORMATION

Birth Date: August 10, 1996

Gender: Female

Nationality: Italian

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Scholar: <https://scholar.google.com/citations?user=uly8D-sAAAAJ&hl=it&oi=ao>

CURRENT POSITION

Researcher, MobS Group, Augmented Intelligence Center, Fondazione Bruno Kessler, Trento, Italy.

GNNs - Temporal GNNs - Pooling in GNNs - Expressivity of GNNs - Link Prediction with GNNs.

EDUCATION

17/07/2024

PhD in Information Engineering & Science (XXXVI cycle), Department of Information Engineering and Mathematics, University of Siena, Italy.

Thesis: "Temporal Graph Processing and Pooling in Graph Neural Networks".

Advisors: Monica Bianchini, Chiara Mocenni.

23/10/2020

MS in Applied Mathematics, Department of Information Engineering and Mathematics, University of Siena, Italy.

Thesis: "Comparative Analysis of Neural Models for Predicting Protein Synthesis Levels".

Advisor: Monica Bianchini

Evaluation: 110/110 cum Laude

24/07/2018

BS in Economia & Commercio, Department of Economic Sciences, University of Florence, Italy.

Thesis: "Differential Calculus in Banach spaces"

Advisor: Antonio Villanacci

Evaluation: 110/110 cum Laude

29/06/2015

High School Diploma, Liceo Scientifico Giovanni da Castiglione, Arezzo, Italy.

Evaluation: 100/100

PUBLICATIONS

Papers In Journals and Conference Proceedings

- [1] **V. Lachi**, F. Ferrini, A. Longa, B. Lepri, A. Passerini, M. Jaeger, *Bridging Theory and Practice in Link Representation with Graph Neural Networks*, Advances in neural information processing systems 38 (2025), Spotlight Paper.
- [2] **V. Lachi**, A. Moallemi-Oureh, A. Roth, P. Welke, *Expressive Pooling for Graph Neural Networks*, Transactions on Machine Learning Research (2025). <https://openreview.net/pdf?id=xGADInGWMt>
- [3] S. Beddar-Wiesing, G. A. D'Inverno, C. Graziani, **V. Lachi**, A. Moallemi-Oureh, F. Scarselli, J. M. Thomas, *Weisfeiler-Lehman goes dynamic: an analysis of the expressive power of graph neural networks for attributed and dynamic graphs*, Neural Networks, 173, 106213 (2024). <https://doi.org/10.1016/j.neunet.2024.106213>
- [4] F. M. Bianchi and **V. Lachi**, *The Expressive Power of Pooling in Graph Neural Networks*, Advances in neural information processing systems 36, 71603-71618 (2023). <https://openreview.net/forum?id=zqyVjCjhYD>
- [5] A. Longa, **V. Lachi**, G. Santin, M. Bianchini, B. Lepri, P. Liò, F. Scarselli, A. Passerini, *Graph Neural Networks for Temporal Graphs: State of the Art, Open Challenges, and Opportunities*, Transactions on Machine Learning Research (2023). <https://openreview.net/forum?id=pHCdMat0gl>
- [6] P. Andreini, S. Bonechi, C. Graziani, **V. Lachi**, N. Nikoloulopoulou, M. Bianchini, F. Scarselli, *Multi-Stage Synthetic Image Generation for the Semantic Segmentation of Medical Images*, Artificial Intelligence and Machine Learning for Healthcare: Vol. 1: Image and Data Analytics (pp. 79-104). Cham: Springer International Publishing (2022). https://doi.org/10.1007/978-3-031-11154-9_5
- [7] P. Andreini, S. Bonechi, C. Graziani, **V. Lachi**, A. Mecocci, A. Sodi, F. Scarselli, M. Bianchini, *A Two-Stage GAN for High-Resolution Retinal Image Generation and Segmentation*, Electronics, 11(1), 60 (2022). <https://doi.org/10.3390/electronics11010060>
- [8] G. Giacomini, C. Graziani, **V. Lachi**, P. Bongini, N. Pancino, M. Bianchini, D. Chiarugi, A. Valleriani, P. Andreini, *A Neural Networks Approach for the Analysis of Reproducible Ribo-Seq Profiles*, Algorithms, 15(8), 274 (2022). <https://doi.org/10.3390/a15080274>

Workshop Papers

[9] F. Ferrini, **V. Lachi**, A. Longa, B. Lepri, A. Passerini, X. Liu, M. Jaeger, *Beyond Sparse Benchmarks: Evaluating GNNs with Realistic Missing Features*, NeurIPS 2025 Workshop: New Perspectives in Graph Machine Learning. <https://openreview.net/forum?id=GfU8DhOzae#discussion>

[10] F. Ferrini, **V. Lachi**, A. Longa, B. Lepri, A. Passerini, *GNNs Meet Sequence Models Along The Shortest-Path: an Expressive Method for Link Prediction*, NeurIPS 2025 Workshop: New Perspectives in Graph Machine Learning. <https://openreview.net/forum?id=mubWzUoEzl#discussion>

[11] **V. Lachi**, F. Ferrini, A. Longa, B. Lepri, A. Passerini, *A Simple and Expressive Graph Neural Network Based Method for Structural Link Representation*, ICML 2024 Workshop on Geometry-grounded Representation Learning and Generative Modeling (2024). <https://openreview.net/forum?id=EGGSCLyVrz>

[12] **V. Lachi**, A. Moallemi-Oureh, A. Roth, P. Welke, *Graph Pooling Provably Increases Expressivity*, NeurIPS 2023 Workshop: New Frontiers in Graph Learning (2023). <https://openreview.net/forum?id=lR5NYB9zrv>

[13] S. Beddar-Wiesing, G. A. D'Inverno, C. Graziani, **V. Lachi**, A. Moallemi-Oureh, F. Scarselli, *On the Extension of the Weisfeiler-Lehman Hierarchy by WL Tests for Arbitrary Graphs*, 18th International Workshop on Mining and Learning with Graphs, ECMLPKDD (2022). <https://openreview.net/forum?id=Qt6GrgDz2y5>

Submitted

[14] F. Ferrini, **V. Lachi**, A. Longa, B. Lepri, A. Matono, A. Passerini, X. Liu, M. Jaeger, *Rethinking GNNs and Missing Features: Challenges, Evaluation and a Robust Solution*, submitted to ICLR (2026).

[15] F. Ferrini, **V. Lachi**, A. Longa, B. Lepri, A. Passerini, *Improving Expressivity in Link Prediction with GNNs via the Shortest Path*, submitted to ICLR (2026).

[16] **V. Lachi**, A. Longa, B. Bevilacqua, B. Lepri, A. Passerini, B. Ribeiro, *Boosting Relational Deep Learning with Pretrained Tabular Models*, submitted to KDD (2026).

Theses

PhD Thesis: Temporal Graph Processing and Pooling in Graph Neural Networks, <https://usiena-air.unisi.it/handle/11365/1265178>

MS Thesis: Comparative Analysis of Neural Models for Predicting Protein Synthesis Levels, led to publication [9].

BS Thesis: Differential Calculus in Banach Spaces.

FOUNDED RESEARCH PROJECTS, GRANTS AND AWARDS

07/2025	Best Poster Award LOGML summer school, poster: <i>Bridging Theory and Practice in Link Representation with Graph Neural Networks</i> .
07/2025	Selected as Mentor at the LOGML summer school.
202/2024	CO-PI in the founded project PRIN 2022 'MEDICA'
11/2020-01/2024	PhD full scholarship in Information Engineering & Science.
03/07/2024	ELLIS Mobility Grant to attend GRaM Workshop, ICML 2024, Wien.
25/10/2023	NeurIPS 2023 Scholar Award , NeurIPS 2023, New Orleans.
27/08/2023	Selected Partecipant , M2L Summer School 2023, Thessaloniki.
28/02/2022	Travel Grant, "Lectures on Mathematics of Deep Learning" , Isaac Newton Institute for Mathematical Sciences, Cambridge.
29/10/2021	First Prize Winner "Rare Disease Hackathon 2021" , Firenze. (https://forumdellaleopolda.it/hackathon-2021/).

SCIENTIFIC PRESENTATIONS

Invited talks

03/2025	TGL Temporal Graph Learning Reading Group, Online. <u>Talk: Temporal Relational Deep Learning</u>
02/2025	University of Aalborg <u>Talk: Pooling in Graph Neural Networks</u>
06/2024	HONS satellite, NetSci 2024, Quebec City, Canada. <u>Talk: Graph Neural Networks for Temporal Graphs.</u>
02/2024	TGL Temporal Graph Learning Reading Group, Online. <u>Talk: Graph Neural Networks for Temporal Graphs.</u>
11/2023	NetPLACE, Online. <u>Talk: Machine Learning for Graphs: Hot Trend and Emerging Frontiers.</u>
09/2023	CENTAI Institute, Turin, Italy. <u>Talk: Graph Pooling in Graph Neural Networks.</u>
11/2022	AlxIA 2022, Udine, Italy. <u>Talk: The Expressive Power of Graph Neural Networks for dynamic graphs.</u>

Contributed talks

07/2023 NetSci 2023, Wien.
Talk: The Temporal Evolution of the Italian Vaccine Debate: a Network Based Analysis.

09/2023 20th International Workshop MLG at ECML-PKDD 2023, Turin.
Talk: The Expressive Power of Pooling in Graph Neural Networks.

10/2022 Conference on Complex Systems 2022, Palme de Mallorca.
Talk: The Temporal Evolution of the Italian Vaccine Debate: a Network Analysis.

Poster Presentations

09/2025 Visual Intelligence Days 2025, Oslo
Poster: Rethinking GNNs Under Missing Features.

07/2025 LOGML Summer School 2025, London
Poster: Bridging Theory and Practice in Link Representation.

12/2024 2nd Italian LoG Meetup 2024, Siena.
Poster: Graphons for Graph Learning: What, Why, How.

12/2024 2nd Italian LoG Meetup 2024, Siena.
Poster: Structural Link Representation Via GNNs on Line Graphs.

07/2024 ICML GRaM Workshop 2024, Wien.
Poster: A Simple and Expressive Graph Neural Network Based Method for Structural Link Representation.

12/2023 Neurips 2023, New Orleans.
Poster: The Expressive Power of Pooling in Graph Neural Networks.

12/2023 Neurips GLFrontiers Workshop 2023, New Orleans.
Poster: Graph Pooling Provably Improves Expressivity.

09/2023 Mediterranean Machine Learning Summer School, Thessaloniki.
Poster: The Expressive Power of Pooling in Graph Neural Networks.

12/2023 1st Italian LoG Meetup 2023, Trento.
Poster: The Expressive Power of Pooling in Graph Neural Networks.

09/2023 20th International Workshop MLG at ECML-PKDD 2023, Turin.
Poster: Graph Neural Networks for Temporal Graphs.

07/2023 NetSci 2023, Wien.
Poster: Graph Neural Networks for Temporal Graphs.

ACADEMIC SERVICES

09/2025 Member of the Program Committee of the 22st International Workshop on Mining and Learning with Graphs 2025, Porto.

09/2025 Examiner for PhD in Information Engineering, Siena University

09/2025 Area Chair for LoG conference 2025

06/2025 Area Chair for Temporal Graph Learning Workshop@KDD 2025

05/2025 External Examiner for the PhD Special Curriculum, Statistics, UiT.

05/2025 External Examiner for the STA-2003 Course, UiT.

12/2024 Organizer of the 2nd Italian Meetup of the LoG Conference 2024, Siena.

09/2024 Evaluator for the admission to the ELLIS PhD Program.

09/2024 Member of the Program Committee of the 21st International Workshop on Mining and Learning with Graphs 2024, Vilnius.

07/2024 Organizer of the Artificial Intelligence for Biomedical Applications (AI4BA) Summer School, Siena.

12/2023 Member of the Scientific Committee of 1st Italian Meetup of the LoG Conference 2023, Trento.

09/2023 Member of the Program Committee of the 20st International Workshop on Mining and Learning with Graphs 2023, Turin.

09/2023 Organizer of the 3rd Young Applied Mathematicians Conference (YAMC), Siena.

07/2023 Volunteering at the 17th International Workshop on Neural-Symbolic Learning and Reasoning (NeSy) 2023, Siena.

07/2023 Member of the thesis committee for the Master of Bioinformatics and Data Science, University of Siena.

10/2022 Organizer of the Artificial Intelligence in Complex Systems Workshop at CCS 2022, Palma de Mallorca.

2021– Referee activity for NeurIPS ICML, ICLR, KDD, IEEE Transactions on Neural Networks (TNNLS), Neurocomputing.

RESEARCH STAYS

01/2023–05/2023 Visiting Scholar, UiT the Arctic University of Norway, Tromsø.
Host: Professor Filippo Maria Bianchi

02/2022 Visiting Scholar, GAIN group, University of Kassel.
Host: Dr. Josephine Maria Thomas

TEACHING EXPERIENCE

09/2025 – 10 hours Teaching Assistant, Master of Bioinformatics and Data Science, University of Siena.
Course: Data Mining for Biological Big Data

09/2024 – 10 hours Teaching Assistant, Master of Bioinformatics and Data Science, University of Siena.
Course: Data Mining for Biological Big Data.

07/2024 – 12 hours Lecturer, Università per Stranieri di Siena.
Course: Fundamentals of Mathematics.

01/2024 – 20 hours Lecturer, ITS course Web Developer, Arezzo.
Course: Statistics.

01/2024 – 12 hours Lecturer, University of Siena.
Course: Mathematics and Physics for TOLC-MED.

09-12/2023 – 30 hours Lecturer, CET Academic Programs, University of Virginia.
Course: Artificial Intelligence.

09/2023 – 10 hours Teaching Assistant, Master of Bioinformatics and Data Science, University of Siena.
Course: Data Mining for Biological Big Data.

10/2022 – 12 hours Lecturer, Università per Stranieri di Siena.
Course: Fundamentals of Mathematics.

10/2022 – 10 hours Teaching Assistant, Master of Bioinformatics and Data Science, University of Siena.
Course: Data Mining for Biological Data.

09-12/2021 – 40 hours Teaching Assistant, University of Siena.
Course: Mathematical Analysis.

10/2021 – 8 hours Lecturer, ITS Fondazione Vita, Siena.
Course: Databases Systems.

THESES AND PROJECTS CO-SUPERVISION

MSc Theses

2022/2023 B.W.C., *The Tutte-Whitney Polynomial for Topologically Informed Graph Neural Networks*, MSc thesis in Applied Mathematics, University of Siena.

Research Project

2025— D.N., J.L., G.S., *Towards a more Rigorous Evaluation of Hyperbolic Graph Neural Networks*, Research Project at LOGLM summer school.

2025— E.M., *Statistical Analysis and Temporal Graph Neural Networks for the Mathematical Modeling of Disinformation Propagation*, PhD project, FBK and University of Trento.

2024/2025 N.M. and C.D., *Approximating volume computations via GNNs*, MSc project for the course Advanced Topics in Machine Learning and Optimization, University of Trento.

2024/2025 A.J. and C.K., *Graph Neural Networks for Relational Databases*, MSc project for the course Advanced Topics in Machine Learning and Optimization, University of Trento.

OTHER EDUCATIONAL ACTIVITIES

08/2023 Participant M2L Summer School, Thessaloniki 2023.

06/2022 Participant ACAI-Taylor Summer School, Barcellona 2022.

05/2022 Participant Theoretical CS Spring School, Marseille 2022.

03/2022 Participant Lectures by Gitta Kutyniok, Mathematics of Deep Learning, University of Cambridge 2022.

07/2021 Participant IRDTA School on Deep Learning, Las Palmas (2021).

OTHER SKILLS

Language Italian: mother tongue, English: fluent.

Coding Python, Matlab: advanced knowledge.