Ivan **Marisca**

Ph.D. Student

ivan.marisca@usi.ch

Lugano, Switzerland

marshka.github.io

ivanmarisca

marshka

IvanMarisca

LANGUAGES

Italian (Native)

English (Professional)

French (Basic)

Spanish (Basic)

About Me

I am a Ph.D. student at the Graph Machine Learning Group, within the Swiss AI lab IDSIA and Università della Svizzera italiana (USI, CH), under the supervision of Prof. Cesare Alippi. Currently, I'm a visiting researcher at University of Oxford with Prof. Michael Bronstein.

I obtained BSc (2017) and MSc (2020) degrees in Computer Science and Engineering at Politecnico di Milano (IT). My master thesis project has been supervised by Prof. Nicola Gatti.

My research focuses on **graph deep learning** for **irregular spatiotemporal data**. I study the problems of **imputation**, **regularization**, and **prediction** of data coming over time from both physical and virtual **sensor networks**.

Education

Ph.D. Student in Informatics — 2020 — ongoing
Università della Svizzera italiana (USI)
Currently, I am a Ph.D. Student at the Swiss AI Lab IDSIA at USI Università della Svizzera Italiana, under the supervision of Prof. Cesare Alippi.

Research visit — Mar 2024 — Aug 2024
University of Oxford
6-month research visit within the group of Prof. Michael Bronstein.

MSc in Computer Science and Engineering — 2017 — 2020
Politecnico di Milano
Master's degree with honors (110/110L), defending a thesis on machine learning. During the two years of studies, I mostly attended AI-oriented courses.

Exchange — Sep 2018 — Jan 2019
Universitat Politècnica de València
During the semester spent abroad – in Valencia – within the Erasmus program, I attended Spanish and English courses on programming, robotics and AI.

BSc in Engineering of Computing Systems — 2014 — 2017
Politecnico di Milano
The course program covered general topics of engineering and computer science.

High School in Mathematics — 2009 — 2014
Liceo C. Caminiti
High school diploma with a specific focus in mathematics and science at *Liceo Scientifico Caminiti* in Santa Teresa di Riva (IT).

Academic Activities

Teaching

- **Advanced Topics in Machine Learning** (TA) – MSc at USI — Sep 2023 — Jan 2024
  Teaching assistant, involved in course organization, lecture preparation and student tutoring.
- **Graph Deep Learning** (TA) – MSc at USI — Feb 2023 — Jun 2023
  Lectures design and students tutoring on team projects.
- **Advanced Topics in Machine Learning** (TA) – MSc at USI — Sep 2022 — Jan 2023
  Students tutoring for projects on reproducibility.
- **Graph Deep Learning** (TA) – MSc at USI — Feb 2022 — Jun 2022
  I gave a lecture on Spatiotemporal Graph Neural Networks and tutored students on projects.
- **Introduzione all'Intelligenza Artificiale e ML** (TA) – MSc at USI — Sep 2021 — Jan 2022
  Course on AI and ML delivered in Italian for high school teachers.
- **Machine Learning** (TA) – BSc at USI — Feb 2021 — Jun 2021
  Lab sessions on practical aspects and show how to design machine learning solutions to real-world problems.

Supervised students

- **Marco Latella**, MSc at USI — 2022
  Graph Representation Learning for Multi-site Photovoltaic Energy Production

Last update: Mar 19, 2024

Talks

- **Reading group presentation** at TGL reading group (Virtual) — Feb 2024
  Invited to present the paper Taming Local Effects in Graph-based Spatiotemporal Forecasting at the Temporal Graph Learning Reading Group. (📹 Video)
- **Tutorial** at ECML/PKDD (Turin) — Sep 2023
  Presentation of the tutorial Graph Deep Learning for Spatiotemporal Time Series with colleagues Daniele Zambon and Andrea Cini.
- **Reading group presentation** at TGL reading group (Virtual) — Apr 2023
  Invited to present the paper Scalable Spatiotemporal Graph Neural Networks at the Temporal Graph Learning Reading Group.
- **Spotlight presentation** at TGL Workshop (New Orleans) — Dec 2022
  The Temporal Graph Learning Workshop at NeurIPS 2022.
- **Poster presentation** at NeurIPS (New Orleans) — Nov 2022
  The 36th Conference on Neural Information Processing Systems.
- **Invited talk** at Baker Hughes (Virtual) — Jul 2022
  Invited to give a webinar on time series imputation with colleague Andrea Cini.
- **Poster presentation** at ICLR (Virtual) — Apr 2022
  The 10th International Conference on Learning Representations.
- **Abstract presentation** at MLDM (Virtual) — Nov 2021
  The 10th Italian Workshop on Machine Learning and Data Mining.

Awards & Scholarships

- **Doctoral Mobility** — Università della Svizzera italiana — Dec 2023
  CHF 20'000 (≈$23K) to cover the expenses for a 6-month research stay at University of Oxford.
- **Travel Award** — NeurIPS — Dec 2023
  Travel award to attend the NeurIPS conference in New Orleans (US).
- **Best Paper Award** — Temporal Graph Learning Workshop @ NeurIPS — Dec 2022
  For the paper "Scalable Spatiotemporal Graph Neural Networks".
- **Travel Award** — NeurIPS — Nov 2022
  Travel award to attend the NeurIPS conference in New Orleans (US).
- **Scholarship** — National Association SAPAR — 2019
  Scholarship awarded to the top-4 students in STEM subjects.
- **Scholarship** — Politecnico di Milano — 2019
  Reduced tuition for high merits.

Projects

I believe in worldwide accessibility of science. As such, I make the software I develop for my research publicly available through my GitHub page. You can also find the code related to my publications on the GitHub page of Graph Machine Learning Group.

Torch Spatiotemporal

Torch Spatiotemporal (**TSL**) is a library built upon PyTorch and PyG for neural spatiotemporal data processing, with a focus on Graph Neural Networks.

GitHub Documentation

Other projects

- **GraPV** — Sep 2020 — Feb 2023
  Developing of graph-based methods for multi-site photovoltaic power forecasting, to improve accuracy on portfolio production prediction. The solution is based on novel graph-based AI strategies exploiting existing heterogeneous information and related dependencies. Joint project in collaboration with DXT Commodities, funded by Innosuisse.

Publications

Graph-based Forecasting with Missing Data through Spatiotemporal Downsampling
Ivan Marisca, Cesare Alippi, Filippo Maria Bianchi
Preprint, 2024

Graph Deep Learning for Time Series Forecasting
Andrea Cini, **Ivan Marisca**, Daniele Zambon, Cesare Alippi
Preprint, 2023

Taming Local Effects in Graph-based Spatiotemporal Forecasting
Andrea Cini*, **Ivan Marisca***, Daniele Zambon, Cesare Alippi
Advances in Neural Information Processing Systems, 2023

Scalable Spatiotemporal Graph Neural Networks
Andrea Cini*, **Ivan Marisca***, Filippo Maria Bianchi, Cesare Alippi
Proceedings of the AAAI conference on artificial intelligence, 2023

Learning to Reconstruct Missing Data from Spatiotemporal Graphs with Sparse Observations
Ivan Marisca*, Andrea Cini*, Cesare Alippi
Advances in Neural Information Processing Systems, 2022

Filling the G_ap_s: Multivariate Time Series Imputation by Graph Neural Networks
Andrea Cini*, **Ivan Marisca***, Cesare Alippi
International Conference on Learning Representations, 2022

*Equal contribution.

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