Alessandro Lonardi
Assistant AI Researcher, Sony AI **Last update: July 25, 2024**

Contact Information

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Research

Probabilistic Models
Generative models for graphs, Bayesian inference methods: belief-propagation algorithms for inference and community detection.

Knowledge Graphs and XAI
Knowledge graph embedding models, explainability in knowledge graph completion, generative models for knowledge graphs.

Mathematical Optimization, Optimal Transport, Routing Algorithms
Optimal transport: bridging theory and applications to machine learning and science, with scalable algorithms. Applications from machine learning tasks to engineering.

Complex Networks
Modeling of emergent phenomena in complex systems: graphs and hypergraphs.

Experience

Assistant AI Researcher at Sony AI, ES — Jul, 2024 – Dec, 2024

Guest Researcher at the Max Planck Institute for Intelligent Systems, DE — Jan, 2024 – Aug, 2024

Head, co-founder at Commute, DE — Oct, 2022 – Apr, 2023
Startup for data-driven solutions for efficient and sustainable transportation.

Research Intern at the Max Planck Institute for Intelligent Systems, DE — Mar, 2020 – Aug, 2020

Education

Max Planck Institute for Intelligent Systems - University of Tübingen, DE — Sep, 2020 – Dec, 2023
IMPRS-IS: International Max Planck Research School

PhD in Computer Science (magna cum laude)
Advisor: Caterina De Bacco (Max Planck Institute for Intelligent Systems)

University of Padova, IT — Oct, 2015 – Jul, 2020

MSc in Mathematical Engineering: Mathematical Modelling for Engineering and Science (cum laude)
BSc in Physics

Coding & Tools

Programming Languages (advanced, $>$ 7 years): Python (Numpy, Scipy, Pandas, Matplotlib, Scikit-learn)
Programming Languages (intermediate): Python (PyTorch), MATLAB, C++, Mathematica
Tools: Git, Poetry, wandb, cluster computing management: HTCondor, LaTeX, HTML, CSS, scientific presentation suites, MacOS, Debian/Arch-based Linux distros, MS Windows

Teaching

Tübingen University: Advanced Probabilistic Machine Learning and Applications. Master's program in Machine Learning (2 terms: 2020, 2021)

Languages

Italian (native), English (fluent), German (intermediate, learning), Spanish (basic)

Selected Recent Publications (from 7 peer-reviewed)

Ruggeri*, **Lonardi***, De Bacco, Message-Passing on Hypergraphs: Detectability, Phase Transitions and Higher-Order Information, Journal of Statistical Mechanics: Theory and Experiment (2024) 10.1088/1742-5468/ad343b

Lonardi, De Bacco, Bilevel Optimization for Traffic Mitigation in Optimal Transport Networks, Physical Review Letters (2024), 10.1103/PhysRevLett.131.267401

Review Service

Journals/Conference (# rev.): PRE (1), J. of Phys. Comm. (3), Physica Scripta (2), SysDo 2024 (1)

Talks

2 talks at Netsci 2023 (flagship conference in network science) | 2 talks at academic seminars | 4 talks at MPI IS scientific events

Volunteering

University orientation for high schoolers: Career perspectives in AI, 2024, Verona, IT (calabreselevi.edu.it)
Volunteer for TReND in Africa Python Workshop 2022, online (trendinafrica.org)
Volunteer for Pint of Science Italia 2016 – 2017, Padua, IT (pintofscience.it)

Other relevant interests

Inference vs. mechanistic modeling in science, coding best practices, efficient problem-solving, personal finance, AI and art