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| Contact Information | Room S2.018 Max-Planck-Ring 4 Tübingen, 72076, Germany | 🏠 Homepage: aleable.github.io 🐙 Github: @aleable 🎓 Google Scholar: Alessandro Lonardi ✉ E-mail: alessandro.lonardi.vr@gmail.com |
| Research | Machine Learning Methods and Machine Learning for Science: Mathematical Optimization, Optimal Transport, Routing Algorithms Discrete optimal transport on graphs: advancements in theory, efficient algorithms, and applications to machine learning and science, from supervised classification to engineering networks. Pathfinding algorithms. Probabilistic Modelling: Inference on Graphical Models Bayesian inference methods: belief-propagation algorithms for inference and community detection. Generative graph modeling. Complex Systems Modeling of emergent phenomena in complex systems: community detection, network efficiency, and robustness, hypergraphs. | |
| Experience | Head, co-founder at Commute Startup for data-driven solutions for efficient and sustainable transportation. Supported by the MAX!mize incubation program for the Max Planck Society by Max Planck Innovation. Research Intern at the Max Planck Institute for Intelligent Systems Research on Routing Algorithm, Optimal Transport, Inference on Graphical Models. | Oct, 2022 – Apr, 2023 Jan, 2020 – Aug, 2020 |
| Education | Max Planck Institute for Intelligent Systems IMPRS-IS: International Max Planck Research School PhD in Computer Science Focus: Mathematical optimization, optimal transport, network routing, probabilistic network models Thesis: Designing Networks with Adaptation Rules and Optimal Transport Advisor: Caterina De Bacco (Max Planck Institute for Intelligent Systems) Università degli Studi di Padova MSc in Mathematical Engineering: Mathematical Modelling for Engineering and Science (cum laude) BSc in Physics | Sep, 2020 – Apr, 2024 Oct, 2015 – Jul, 2020 |
| Coding & Tools | Programming Languages (advanced, > 6 years): Python (Numpy, Scipy, Pandas, Matplotlib, Scikit-learn) Programming Languages (intermediate-basic): Python (PyTorch), MATLAB, C++, Mathematica Tools: Git, cluster computing management: HTCondor, \LaTeX , HTML, CSS, scientific presentation suites, MacOS, Debian/Arch-based Linux distros | |
| 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 | Lonardi , De Bacco, Bilevel Optimization for Traffic Mitigation in Optimal Transport Networks, Physical Review Letters (2024), 10.1103/PhysRevLett.131.267401 (form 7 peer-reviewed) Ruggieri*, Lonardi *, De Bacco, Message-Passing on Hypergraphs: Detectability, Phase Transitions and Higher-Order Information, Journal of Statistical Mechanics: Theory and Experiment, 2024 (* = equal contribution) | |
| Review Service | Journals (# rev.): Journal of Physics Communications (3), Physica Scripta (2) | |
| Talks | 2 talks at Netsci 2023 (flagship conference in network science) 2 talks at academic seminars 4 talks at MPI IS scientific events | |
| Volunteering | Volunteer for TRenD in Africa Python Workshop 2022, online (trendinafrica.org) Volunteer for Pint of Science Italia 2016 – 2017, Padua, Italy (pintofscience.it) | |
| Other relevant interests | XAI, Inference vs. mechanistic modeling in science, coding best practices, efficient problem-solving, personal finance, AI and art | |