Ilie Sarpe

Curriculum Vitae

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About me

I am a postdoctoral researcher mentored by Prof. Aristides Gionis. I got my PhD in Computer Engineering under the supervision of Prof. Fabio Vandin. My research interests focus the design of efficient, rigorous and scalable algorithms for knowledge extraction (such as patterns) from large data. I am therefore focused on designing algorithms with provable theoretical guarantees, often leveraging techniques and results from probability theory. I especially enjoy graph data and networks.

Education

PhD Student
Oct 2019 - Mar 2023
University of Padova, Italy
Department of Information Engineering

Thesis Title: Efficient and Rigorous Algorithms for the Analysis of Large Temporal Networks
Advisor: Prof. Fabio Vandin

M.S. in Computer Engineering
Oct 2017 - Sep 2019
University of Padova, Italy
Department of Information Engineering

Thesis title: Mining Motifs in Temporal Networks
Grade: 110/110 e lode (*summa cum laude*)
Advisor: Prof. Fabio Vandin

B.S. in Computer Engineering
Oct 2014 - Sep 2017
University of Padova, Italy
Department of Information Engineering

Thesis title: Statistical Correlation between Alignment-free and Edit Distance Measures
Grade: 104/110
Advisor: Prof. Matteo Comin

Academic Appointments

Postdoctoral Researcher
Sep 2023 - Sep 2025 — Department of Computer Science, KTH, Stockholm (Sweden), mentored by Prof. Aristides Gionis.

Research Fellow
Mar 2023 - Jun 2023 — Department of Information Engineering, Unipd, Padova (Italy), mentored by Prof. Fabio Vandin.

Visiting PhD Student
Oct 2022 - Jan 2023 — Department of Computer Science, KTH, Stockholm (Sweden), hosted by Prof. Aristides Gionis.

Teaching

Teaching Assistant
2018 - 2021 — *Big Data Computing*, Department of Information Engineering, University of Padova

Teaching Assistant
2017 - 2019 — *Tutorato Formativo*, Department of Information Engineering, University of Padova

Publications

Ilie Sarpe, Fabio Vandin and Aristides Gionis, *Scalable Temporal Motif Densest Subnetwork Discovery*, Accepted at the 30th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2024). (Acceptance rate $\approx$ 20%)

Diego Santoro* and *Ilie Sarpe**†, ONBRA*: Rigorous Estimation of the Temporal Betweenness Centrality in Temporal Networks*, Accepted at the ACM The Web Conference 2022 (WWW 2022). (Acceptance rate 17.7%)

Ilie Sarpe and Fabio Vandin, ODEN*: Simultaneous Approximation of Multiple Motif Counts in Large Temporal Networks*, Accepted at the 30th ACM International Conference on Information and Knowledge Management (CIKM 2021). ***Selected presentation*** (only a small number of works were selected for live presentation). (Acceptance rate 21.7%)

Ilie Sarpe and Fabio Vandin, *PRESTO: Simple and Scalable Sampling Techniques for the Rigorous Approximation of Temporal Motif Counts*, Accepted at the 2021 SIAM International Conference on Data Mining (SDM21). (Acceptance rate 21.15%)

* denotes equal contribution.

† denotes contact author.

Talks at International Conferences

29th April 2021 — *PRESTO: Simple and Scalable Sampling Techniques for the Rigorous Approximation of Temporal Motif Counts*. 2021 SIAM International Conference on Data Mining (SDM21), April 29 - May 1, 2021, Virtual Event.

4th November 2021 **Selected talk** — ODEN*: Simultaneous Approximation of Multiple Motif Counts in Large Temporal Networks*. 30th ACM International Conference on Information and Knowledge Management (CIKM 2021), 1 - 5 November 2021, Queensland (Australia), Virtual Event.

28th April 2022 — ONBRA*: Rigorous Estimation of the Temporal Betweenness Centrality in Temporal Networks*. ACM The Web Conference 2022 (WWW 2022), 25-29 April 2022, Lyon (France), Virtual Event.

Tutorials

13th May 2024 — Aristides Gionis, Lutz Oettershagen and *Ilie Sarpe*. *Mining Temporal Networks*. 2024 ACM on Web Conference 2024 (The Web Conference 2024), May 13 - May 17, 2024, Singapore. Lecture-style.

Invited Talks

13th September 2023 — *Discovering Temporal Motif Densest Subnetworks*. Workshop on Algorithmic Aspects of Clustering and Related Problems (ALACARTE 2023), Bertinoro BICI.

22nd December 2021 — *Motifs in Temporal Networks Definitions, Algorithms and Applications*. Invited lecture for the *Learning from Networks* M.Sc. course, Department of Information Engineering, University of Padova, Italy.

Fellowships and Awards

Oct 2022 — SoBigData Transnational Access (known as TNA) support for short term visits.

Oct 2019 - Dec 2022 — PhD Fellowship from "Department of Information Engineering (DEI)", University of Padova, Italy

2017 — Award for scientific degrees, award given to the best 500 students of scientific degrees, University of Padova, Italy

2017 — "Mille e una lode", award for the top 5% students of the academic year 2016, University of Padova, Italy

2016 — "Mille e una lode", award for the top 5% students of the academic year 2015, University of Padova, Italy

Other Information

Supervision

Master students — Davide Peressoni (2022, co-supervised)
Giorgio Venturin (2023, co-supervised)

Bachelor students — Filippo Ronco (2020, co-supervised)

Program Committee Member — KDD 2023, ECCB 2023, WSDM 2024, SDM 2024, WWW 2024, KDD 2024

Conference Reviewer — RECOMB 2020, KDD 2020, ICDM 2020, WWW 2021, ECML-PKDD 2021, ICDM 2021, WSDM 2022, WWW 2022, KDD 2022, ICDM 2022, ACDA23, WWW 2023, ECML-PKDD 2023, ESA 2023

Journal Reviewer — Journal of Graph Algorithms and Applications.

Session Chair	TheWebConference 2024, Session: Algorithms for social networks.
Projects	PRIN Project n. 20174LF3T8 AHeAD (Efficient Algorithms for Harnessing Networked Data), MIUR Italy. "SID 2020: RATED-X", University of Padova, Italy. EC H2020 Research and Innovation project n. 871042 "SoBigData++".
Programming Experience	C++, C, Java, Python, MATLAB, SQL, NoSQL, Bash, LaTeX
Programming Frameworks	Apache Spark, IBM ILOG CPLEX
Languages	Native Italian and Romanian Speaker, B2 English
Software Packages	Open-source software packages:

- PRESTO: an efficient sampling algorithm for estimating the count of a temporal motif in a temporal network. `https://github.com/VandinLab/PRESTO`.
- ODEN: and efficient sampling algorithm for estimating the counts of multiple temporal motifs sharing a common topological structure. `https://github.com/VandinLab/odeN`.
- ONBRA: an efficient algorithm for estimating the temporal betweenness centrality of the various nodes in a temporal network under two criteria for the paths considered. `https://github.com/iliesarpe/onbra`.