Lutz Oettershagen

Curriculum Vitae

✉ *lutz.oettershagen@cs.uni-bonn.de*
lutzoe.github.io

Education

2018–2022 **Ph.D. in Computer Science**, *University of Bonn*, Bonn, Germany.
Summa Cum Laude
- **Adviser:** Prof. Dr. Petra Mutzel
- **Thesis:** Temporal Graph Algorithms
- **Committee:** Prof. Dr. Petra Mutzel (University of Bonn), Prof. Dr. Giuseppe F. Italiano (LUISS University), Prof. Dr. Anne Driemel (University of Bonn), Prof. Dr. Jürgen Kusche (University of Bonn)

2014–2017 **M.Sc. in Computer Science**, *TU Dortmund University*, Germany.
Graduated with Honors

2008–2014 **B.Sc. in Computer Science**, *TU Dortmund University*, Germany.

Research Interests

- **Algorithmic Data Analysis**
- **Algorithm Engineering**
- **Graph Data Mining**
- **Machine Learning**

My primary research areas are algorithmic data analysis, data mining, and machine learning on graphs. My research focuses strongly on mathematical and computational foundations and the engineering and application of efficient algorithmic data analysis on dynamic graphs for solving real-world problems.

Research and Work Experience

2022–Present **Postdoctoral Researcher**, *LAMARR Institute for Machine Learning and Artificial Intelligence/University of Bonn*, Bonn, Germany.
Research and Teaching

2019–2022 **Scientific Staff**, *University of Bonn*, Bonn, Germany.
Research and Teaching

2018–2019 **Scientific Staff**, *TU Dortmund University*, Dortmund, Germany.
Research and Teaching

2014–2017 **Research Assistant**, *TU Dortmund University*, Dortmund, Germany.
Research

2009–2014 **Research Assistant**, *Fraunhofer Institut für Software und Systemtechnik*, Dortmund, Germany.
Research and Software Implementation

Scientific Activities

Program Committees

2023 ACM SIGKDD Conference on Knowledge Discovery and Data Mining

2023 AAAI Conference on Artificial Intelligence

2022 European Conference on Machine Learning and Knowledge Discovery in Databases (ECMLPKDD)

Reviewing

Journals Cybernetics and Systems (2023), Network Science (2022), Theoretical Computer Science (2022), Transactions on the Web (2022), Information Processing Letters (2022), Geo-spatial Information Science (2022), Journal of Experimental Algorithmics (2021)

Conferences The Web Conf (2022), Similarity Search and Applications - SISAP (2021), ALENEX (2020), WG (2018)

Talks and Posters

2022 Presented paper [C6] and a corresponding poster at the European Conference on Machine Learning and Data Mining (ECMLPKDD).

2022 Presented paper [W1] and a corresponding poster at the 18th International Workshop on Mining and Learning with Graphs.

2022 Invited participant (of 53) to the 1st SIAM Applied and Computational Discrete Algorithms (ACDA) Workshop, giving a talk on "*Inferring Tie Strength in Temporal Networks*".

2022 Presented a poster at the European Space Agency's Living Planet Symposium with the title "*mSTAR: Multicriteria Spatio Temporal Altimetry Retracking*".

2022 Presented paper [C5] at the ACM The WebConf

2021 Presented paper [C4] at the 21th IEEE Intl Conference on Data Mining (ICDM).

2021 Presented paper [C3] at the SIAM Intl Conference on Data Mining (SDM).

2019 Presented paper [C2] at the 15th Theory and Applications of Models of Computation (TAMC).

2019 Presented paper [C1] at the 29th International Workshop on Combinatorial Algorithms (IWOCA).

Awards

2022 Paper [W1] was awarded with the **best paper award** at the 18th International Workshop on Mining and Learning with Graphs.

Publications

Peer Reviewed Journal Articles

[J2] **Lutz Oettershagen** and Petra Mutzel.
Computing Top-k Temporal Closeness in Temporal Networks.
Knowledge and Information Systems 64.2 (2022): 507-535

[J1] **Lutz Oettershagen**, Nils M Kriege, Christopher Morris, and Petra Mutzel.
Classifying Dissemination Processes in Temporal Graphs.
Big Data 8.5 (2020): 363-378

Peer Reviewed Conference Publications

[C8] **Lutz Oettershagen** and Petra Mutzel.
An Index For Temporal Closeness Computation in Evolving Graphs.
To appear in the Proceedings of the SIAM International Conference on Data Mining, 2023

[C7] **Lutz Oettershagen**, Nils M Kriege, Claude Jordan, Petra Mutzel.
A Temporal Graphlet Kernel For Classifying Dissemination in Evolving Networks.
To appear in the Proceedings of the SIAM International Conference on Data Mining, 2023

[C6] **Lutz Oettershagen**, Athanasios L Konstantinidis, and Giuseppe F Italiano.
Inferring Tie Strength in Temporal Networks.
In Proceedings of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases, 2022

[C5] **Lutz Oettershagen**, Petra Mutzel, and Nils M Kriege.
Temporal Walk Centrality: Ranking Nodes in Evolving Networks.
In Proceedings of the ACM Web Conference 2022, pages 1640–1650, 2022

[C4] **Lutz Oettershagen** and Petra Mutzel.
Efficient Top-k Temporal Closeness Calculation in Temporal Networks.
In Proceedings of the 20th IEEE International Conference on Data Mining, pages 402–411. IEEE, 2020

[C3] **Lutz Oettershagen**, Nils M Kriege, Christopher Morris, and Petra Mutzel.
Temporal Graph Kernels for Classifying Dissemination Processes.
In Proceedings of the SIAM International Conference on Data Mining, pages 496–504. SIAM, 2020

[C2] Petra Mutzel and **Lutz Oettershagen**.
On the Enumeration of Bicriteria Temporal Paths.
In Proceedings of the 15th International Conference on Theory and Applications of Models of Computation, pages 518–535. Springer, 2019

[C1] Petra Mutzel and **Lutz Oettershagen**.
The Crossing Number of Seq-Shellable Drawings of Complete Graphs.
In Proceedings of the 29th International Workshop on Combinatorial Algorithms, pages 273–284. Springer, 2018

Peer Reviewed Workshop Papers

[W2] **Lutz Oettershagen** and Petra Mutzel.
TGLib: An Open-Source Library for Temporal Graph Analysis.
In the Proceedings of the IEEE ICDM 2022 Workshops, 2022

[W1] **Lutz Oettershagen**, Nils M Kriege, Claude Jordan, Petra Mutzel.
A Temporal Graphlet Kernel For Classifying Dissemination in Evolving Networks.
18th International Workshop on Mining and Learning with Graphs, 2022

Open-Source Software

TGLib: An open-source library for analyzing and processing temporal graphs
- See [W2] for the corresponding publication
- Available at `https://gitlab.com/tgpublic/tglib`

Supervised Theses

Master's Theses

2022 Link Prediction in Dynamic Communication Networks Using Graph Neural Networks

2021 Similarity Measures for Temporal Graphs based on the k-dimensional Weisfeiler-Leman Refinement

Bachelor's Theses

2022 Centrality measures for temporal graphs based on mutual reachability

2022 Comparison of centrality measures on static graphs to identify superspreaders

2022 BOBA* for marine data

2021 Classification of temporal graphs with graph kernels

2021 Maximal-flow graph kernel

2021 Development and Evaluation of Synthesis Approaches for Temporal Graphs with Generative Adversarial Networks

2021 Synthesis of Realistic Temporal Graphs

2019 Route planning for two vehicles in graphs with time-exclusive edges

2019 Determination of separations in drawings of complete graphs

Teaching

Labs and Seminars

Summer term 2022 **Lab Computational Analytics: Temporal Graphs for Functional Brain Network Analysis.**
M.Sc. Level Lab

Summer term 2020 **Lab Computational Analytics: Algorithms for Learning on Temporal Graphs.**
M.Sc. Level Lab

Summer term 2019 **Graph Algorithms**.
B.Sc. Level Seminar

Summer term 2018 **Algorithm Engineering**.
M.Sc. Level Seminar

Winter term 2017–2018 **Introduction into Programming**.
B.Sc. Level Lab

Tutoring

Winter term 2022–2023 **Algorithms for Data Analysis**.
M.Sc. Level Class

Winter term 2021–2022	**Algorithms for Data Analysis**. M.Sc. Level Class
Summer term 2021	**Graph algorithms**. B.Sc. Level Class
Winter term 2020–2021	**Advanced Algorithms**. M.Sc. Level Class
Winter term 2019–2020	**Algorithms and Complexity**. B.Sc. Level Class
Summer term 2021	**Software Technology**. B.Sc. Level Class
Winter term 2019–2020	**Introduction into Programming**. B.Sc. Level Class
Summer term 2018	**Theoretical Computer Science**. B.Sc. Level Class
Summer term 2017	**Efficient Algorithms**. B.Sc. Level Class