Dr. Lara Chiara Ost, MSc ETH MSc

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Experience

October 2019–March 2025	Prae-Doc Assistant in the research group Theory and Applications of Algorithms, University of Vienna ▷ Researched dynamic algorithms for graph problems, topological data analysis, differential privacy and trajectory analysis ▷ Developed, optimized and benchmarked performance oriented implementations of algorithms in C++ ▷ Evaluated reproducibility of published results as part of the ALENEX 2025 Artifact Evaluation Committee; acted as (sub-)reviewer for conferences (ALENEX, SODA, ESA, SEA, ACDA, SIROCCO) ▷ Local organizer of the "Symposium on Experimental Algorithms" 2024 ▷ Taught courses "Algorithms and Data Structures 2" and "Advanced Algorithms"; co-supervised a bachelor's thesis and master's theses
October 2018–June 2019	Teaching assistant for "Foundations of Computer Graphics", University of Vienna

Projects

BananaPersist (2025) `github.com/laraost/BananaPersist`, described in [1, 3]

Data structure to maintain the persistence diagram of time series under changes to the input. This work introduces the novel banana tree structure, which can be efficiently updated when the input is modified. I co-designed the data structure, implemented it in C++ and performed experiments to analyze its performance.

DyDJ-Match (2023) `github.com/DJ-Match/DyDJ-Match`, described in [4]

Dynamic algorithms to compute maximum disjoint matchings in weighted graphs. We are the first to study this problem in the dynamic setting, where inputs may change. This work is motivated by an application to optical networks in data centers. I co-designed the algorithms, implemented them in C++ and evaluated their performance.

Contribution to KaHIP (2020) `kahip.github.io`, described in [7]

I contributed an algorithm to compute node orderings with small fill-in, based on nested dissection. This work incorporates reduction rules into nested dissection to improve the algorithm's performance in practice. I implemented the algorithm in C++, analyzed it in extensive experiments and integrated it into the existing KaHIP-framework (version 3.0).

Education

March 2020–February 2025	Dr. techn. in Computer Science, University of Vienna Member of the "Vienna Graduate School on Computational Optimization" Thesis: *"Engineering Efficient Algorithms for the Analysis of Dynamic Data"* Supervisors: Prof. Monika Henzinger, Prof. Kathrin Hanauer
March–June 2023	Research stay, DTU Kopenhagen Research on discrete subtrajectory clustering algorithms
October 2017–September 2019	MSc in Computational Science, University of Vienna, pass with distinction Master's thesis: *"Reduced Nested Dissection for Fill Reducing Node Orderings"*
September 2015–May 2016	MSc ETH in Chemistry, ETH Zürich Master's thesis: *"Prejudice-Free Exploration of Reaction Space with Quantum Chemical Methods"*
Fall 2014	Exchange semester, Uppsala University
September 2012–May 2015	BSc ETH in Chemistry, ETH Zürich
October 2011–June 2012	Studies of classical archaeology and Greek philology, University of Tübingen

Skills

Languages	German, English, basics in French, Spanish and Swedish, Großes Latinum (advanced proficiency certificate in Latin), Graecum (proficiency certificate in Ancient Greek)
Programming Languages	C++, R, Python, Rust, Java, SQL, Matlab, JavaScript, LaTeX
Technologies	Linux, vim, git, cmake, meson

Other Activities

September 2018	Summer School Deep Learning and Visual Data Analysis, University of Vienna
2011	Qualification as part-time church musician with D-examination, Protestant Church of Baden, Germany

Publications

[1] Lara Ost, Sebastiano Cultrera di Montesano, and Herbert Edelsbrunner.
Banana Trees for the Persistence in Time Series Experimentally. To appear. 2025. arXiv: 2405.17920 [cs.DS].

[2] Lara Ost, Eva Rotenberg, Daniel Rutschmann, and Ivor van der Hoog.
Efficient Greedy Discrete Subtrajectory Clustering. To appear. 2025. arXiv: 2503.14115 [cs.CG].

[3] Sebastiano Cultrera di Montesano, Herbert Edelsbrunner, Monika Henzinger, and Lara Ost.
Dynamically Maintaining the Persistent Homology of Time Series.
In: *Proceedings of the 2024 Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*. 2024, pp. 243–295.
DOI: 10.1137/1.9781611977912.11.

[4] Kathrin Hanauer, Monika Henzinger, Lara Ost, and Stefan Schmid.
Dynamic Demand-Aware Link Scheduling for Reconfigurable Datacenters.
In: *IEEE INFOCOM 2023 - IEEE Conference on Computer Communications*. 2023, pp. 1–10.
DOI: 10.1109/INFOCOM53939.2023.10229050.

[5] Hendrik Fichtenberger, Monika Henzinger, and Lara Ost.
Differentially Private Algorithms for Graphs Under Continual Observation.
In: *29th Annual European Symposium on Algorithms (ESA 2021)*. 2021. DOI: 10.4230/LIPIcs.ESA.2021.42.

[6] Hendrik Fichtenberger, Monika Henzinger, and Lara Ost.
Differentially Private Algorithms for Graphs Under Continual Observation.
Poster at the Workshop on Theory and Practice of Differential Privacy at ICML 2021.

[7] Lara Ost, Christian Schulz, and Darren Strash. *Engineering Data Reduction for Nested Dissection*.
In: *2021 Proceedings of the Symposium on Algorithm Engineering and Experiments (ALENEX)*. 2021, pp. 113–127.
DOI: 10.1137/1.9781611976472.9.