Maximilian Vötsch

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Summary

Outgoing PhD student interested in the design and implementation of algorithms. My PhD work was focused on engineering algorithms for unsupervised learning problems. I'm passionate about writing efficient code and low-level optimization. I have excellent communication skills and am experienced in international collaboration.

Work Experience

University of Vienna
Feb 2021 - Jan 2025

Prae-Doc Assistant

- Part of the Theory and Applications of Algorithms (TAA) group, where I used methods of classical algorithms research to design algorithms for unsupervised learning objectives and implemented them in C++
- Extensive experience in supervising and teaching students in mathematics, algorithms, data structures
- Experience in oganizing projects, conferences and workshops

Projects

XCut (published at KDD 2024)
May 2023 - Present

A graph clustering algorithm implemented using random walks and the theory of expander decomposition. The algorithm sparsifies a graph to a tree and uses this to solve the normalized cut problem. Current state of the art solver for this problem.

- **Technologies:** C++, CMake, Python, pandas, pyplot

PRONE (published at NeurIPS 2023)
February 2023 - Present

New algorithm for solving Euclidean k-means and creating coresets for downstream applications in time $O(n \log n)$. Made available as a Python package for the data science community. Main implementation in C++, with Cython wrappers provided to make it available to data scientists using python.

- **Technologies:** C++, Python, Cython, numpy, pandas, pyplot

Education

University of Vienna
February 2021 - (expected) March 2025

Dr. techn. Computer Science
Supervisors: Monika Henzinger and Kathrin Hanauer
Thesis Title: Efficient Algorithms for Problems in Clustering and Fairness

University of Vienna
October 2014 - August 2020

B.Sc. and M.Sc. Mathematics

Skills

Languages: C++, Python, Haskell, Rust, Java, German (native), English (fluent)
Technology: Linux, git, unix shell, cmake, poetry, clang-tidy
Libraries: Blaze, OpenMP, OpenMPI, pandas, numpy, scikit-learn, pytorch

Awards

- KDD 2024 Audience Appreciation Award — August 2024

Personal Interests

Bouldering, Analog and Digital Photography, Electronics, Guitar