

Rico Zenklusen

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ETH Zurich, Switzerland

Advances in Approximation Algorithms for Tree Augmentation

Abstract: Augmentation problems are a fundamental class of Network Design problems. The goal is to find a cheapest way to increase the (edge-)connectivity of a graph by adding edges among a given set of options. The Minimum Spanning Tree Problem is one of its most elementary examples, which can be interpreted as determining a cheapest way to increase the edge-connectivity of a graph from 0 to 1. The "next step", to increase from 1 to 2, leads to the heavily studied Tree Augmentation Problem, which is the focus of this talk. This talk has several goals, namely:

- 1. Providing a brief introduction to Tree Augmentation and some related problems.
- 2. Discussing relevant algorithmic techniques, including the Relative Greedy method and a new link to local search procedures.
- 3. Showing how these techniques can be leveraged to address a long-standing open question, namely how to obtain better-than-2 approximations for (Weighted) Tree Augmentation.

Bio: Rico Zenklusen is a Professor in the Mathematics Department at ETH Zurich, heading the Combinatorial Optimization Group. Prior to joining ETH Zurich, Rico was on the faculty of the Johns Hopkins University, before which he worked several years as a postdoc at MIT, and also shortly at EPFL. Rico holds a PhD from ETH Zurich and a master's degree from EPFL. His main research interests lie broadly in Combinatorial Optimization and its applications, ranging from foundational research related to polyhedra, (poly-)matroids, and submodular functions to industrial collaborations.

Link to the Zoom session:

https://us02web.zoom.us/j/81100173104?pwd=HTAZbKF9g2xEHgWl3y68G3v4oSyj9L.1