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Shortest Paths and Tropical Geometry

Abstract for the Combinatorics Seminar 2019 February 19

One of the most basic classes of algorithmic problems in combinatorial optimization is the computation of shortest paths. Tropical geometry is a natural language to analyze parametrized versions where some of the arc weights are unknown. I will introduce this point of view, with a link to polyhedral geometry. Moreover, I will present two applications for those graphs, traffic networks and the enumeration of polytropes, building blocks of tropical convexity. This is ongoing work with Michael Joswig.

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