

Máté Telek

Title: Positive Solutions to Polynomial Systems via Tropical Geometry

Abstract: Tropical geometry establishes a connection between algebraic and polyhedral geometry, allowing to transform an algebraic variety into a polyhedral object, called tropical variety, that mimics essential properties of its algebraic counterpart. Recently, there has been increasing attention on the tropicalization of the positive part of algebraic varieties, i.e. the intersection of the variety with the positive real orthant.

After a gentle introduction to tropical geometry, we will discuss real analogs of the Fundamental Theorem of Tropical Geometry and the Transverse Intersection Theorem. Building on these results, we will present an algorithm that provides lower bounds on the maximal number of positive real solutions of a parametrized polynomial equation system. The talk is based on joint work with Kemal Rose.