Skeletal degeneracy for hypergraph Turán and Ramsey problems

Jonathan Tidor

Abstract

We define the skeletal degeneracy of a hypergraph to be the degeneracy of its 1-skeleton. Unlike the usual notion of hypergraph degeneracy, we show that skeletal degeneracy gives good control over Turán- and Ramsey-type properties of a hypergraph. In particular, we show that k-uniform hypergraphs with bounded skeletal degeneracy have linear Ramsey number and we give closely-matching upper and lower bounds on the Turán exponent of a k-uniform k-partite hypergraph in terms of its skeletal degeneracy. The proof of both of these results uses dependent random choice.

Joint work with Jacob Fox, Maya Sankar, Michael Simkin, and Yunkun Zhou.