

Graph representations: measured intersections

Zoltán Füredi

University of Illinois at Urbana-Champaign

z-furedi@math.uiuc.edu

and

Rényi Alfréd Mathematical Institute, Budapest

There are many interesting ways to represent the vertices of a given graph with geometric objects (like intervals or vectors), or by sets and the incidencies by certain relations between these objects. After a short historic overview we consider max-representations, as follows.

A hypergraph $\mathcal{H} = \{H_1, \dots, H_n\}$ is called a *k-representation* of the graph G if $V(G) = \{1, 2, \dots, n\}$ and (i, j) is an edge if and only if $\max\{|H_i \setminus H_j|, |H_j \setminus H_i|\} \geq k$. Let $k(G) := \min k$.

Improving earlier results of Boros, Gurvich and Meshulam (2004) we show that for most n -vertex graphs $k(G)$ is asymptotic to $\Theta(n/\log n)$. We show similar results for "min" and "ave" representations, too, and propose a number of problems.