Ida Kantor

Contact Information

Institut teoretické informatiky
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Education

University of Illinois, Urbana, Illinois USA

Ph.D., Mathematics, December 2010.
Advisor: Zoltán Füredi
Thesis: *Graphs, codes, and colorings.*

M.Sc., Applied Mathematics, August 2009.

Charles University, Prague, Czech Republic

B.Sc., Mathematics, May 2003.

Visited Institutions

Institute for Pure & Applied Mathematics, University of California, Los Angeles — October - December 2009

Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences — February – May 2010

Honors and Awards

Fellowship at the Institute for Pure and Applied Mathematics, UCLA — October – December 2009
Dr. Lois M. Lackner Mathematics Fellowship — January 2008 – May 2010
Named to the List of Teachers Ranked Excellent By Their Students — Fall 2006
UIUC University Fellowship — August 2004 – July 2005

Positions held

Postdoctoral Researcher, Charles University — September 2010 – present

Research Assistant, University of Illinois — June – July 2007 and 2009 and June – December 2010

Teaching Assistant, University of Illinois — August 2005 – December 2007
Calculus I, III (leading discussion sections)
Mathematical world, Introductory Matrix Theory (full instructor)

Teaching Assistant, Charles University — October 2003 – January 2004
Discrete Mathematics (leading discussion sections)

Publications

Z. Füredi, I. Kantor, A. Monti, B. Sinaimeri, *On reverse free codes and permutations*,
SIAM J. Discrete Math. 24 (2010), no. 3, 964–978

Z. Füredi, I. Kantor, *List colorings with distinct list sizes, the case of complete bipartite graphs*,
Electron. Notes Discrete Math. 34 (2009), 323-327

J. Nešetřil, I. Švejdarová, *Small Diameters of Duals*,
SIAM J. Discrete Math. 21 (2007), no.2, 374-384

J. Barát, Z. Füredi, I. Kantor, Y. Kim, B. Patkós, *Large B_d-free and union-free subfamilies*
(submitted, available at http://arxiv.org/abs/1012.3918)

I. Kantor, *Prague dimension of trees*
(in preparation)

Professional Referee experience, Discrete Applied Mathematics.

Talks

Rényi Institute of Mathematics, Hungarian Academy of Sciences, Budapest, 2010
EuroComb: European Conference on Combinatorics, Graph Theory and Applications, 2009, University of Bordeaux
WaterMellon Workshop on Extremal Graph Theory, 2009, University of Waterloo
Midwestern Graph Theory Conference, 2007, The University of Detroit Mercy
DIMACS/DIMATIA/Rényi Working Group on Algebraic and Geometric Methods in Combinatorics, DIMACS, 2006
Graduate Student Combinatorics Conference, 2006, University of Wisconsin-Madison
Two seminar talks, University of Illinois at Urbana-Champaign, 2008-2009

Research interests (paper abstracts)

On reverse free codes and permutations.
A set $\mathcal{F}$ of ordered k-tuples of distinct elements of an n-set is pairwise reverse free if it does not contain two ordered k-tuples with the same couple of elements in the same couple of coordinates in reversed order. Let $F(n,k)$ be the maximum size of a pairwise reverse free set. In this paper we focus on 3-tuples and prove $\lim_{n\to\infty} F(n,3)/\binom{n}{3} = 5/4$, with an exact result whenever n is a power of 3. We prove results for related parameters, as well.

List colorings with distinct list sizes, the case of complete bipartite graphs.
A graph G is *f-choosable* if for every collection of lists with list sizes specified by f there is a proper coloring using colors from the lists. The sum choice number, $\chi_{sc}(G)$, is the minimum of $\sum f(v)$, over all f such that G is f-choosable. In this paper we show that $\chi_{sc}(G)/|V(G)|$ can be bounded while the minimum degree $\delta_{\min}(G) \to \infty$. (This is not true for the list chromatic number, $\chi_\ell(G)$). Our main tool is to give tight estimates for the sum choice number for the complete bipartite graphs $K_{a,q}$.

Small Diameters of Duals.
We prove that dual graphs and relational structures are connected. Moreover we give efficient bounds for their diameter. This bound is linear in the case of oriented graphs (and this is best up to a constant) and in the case of relational structures we give a polynomial bound.

Large B_d-free and union-free subfamilies.
For a property Γ and a family of sets $\mathcal{F}$, let $f(\mathcal{F},\Gamma)$ be the size of the largest subfamily of $\mathcal{F}$ having property Γ. For a positive integer m, let $f(m,\Gamma)$ be the minimum of $f(\mathcal{F},\Gamma)$ over all families of size m. A family $\mathcal{F}$ is said to be B_d-free if it has no subfamily $\mathcal{F}' = \{F_I : I \subseteq [d]\}$ of 2^d distinct sets such that for every $I, J \subseteq [d]$, both $F_I \cup F_J = F_{I\cup J}$ and $F_I \cap F_J = F_{I\cap J}$ hold. A family $\mathcal{F}$ is a-union free if $F_1 \cup ... F_a \neq F_{a+1}$ whenever $F_1, .., F_{a+1}$ are distinct sets in $\mathcal{F}$. We verify a conjecture of Erdős and Shelah that $f(m, B_2\text{-free}) = \Theta(m^{2/3})$. We also obtain lower and upper bounds for $f(m, B_d\text{-free})$ and $f(m, a\text{-union free})$.

Prague dimension of trees.
The *product dimension* (or Prague dimension) of a graph G, denoted dim (G), is the minimum number k such that G is an induced subgraph of Cartesian product of k complete graphs. We improve the known bounds for product dimension of trees and determine the exact numbers for an infinite family of trees.