On sizes of 1-cross intersecting set pair systems

Kostochka, Alexandr V.
University of Illinois at Urbana-Champaign

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Abstract:

Let $(A_i, B_i)_{i=1}^m$ be a set pair system. Füredi, Gyárfás and Király called it 1-cross intersecting if the size of intersection of A_i and B_j is 1 when i and j are distinct, and 0 if $i = j$. They studied such systems and their generalizations, and in particular considered $m(a, b, 1)$, the maximum size of a 1-cross intersecting set pair system in which $|A_i| \le a$ and $|B_i| \le b$ for all i.

Answering one of their questions, Holzman proved that if $a, b \ge 2$, then $m(a, b, 1) \le (29/30)\binom{a+b}{a}$. He also conjectured that the factor $29/30$ in his bound can be replaced by $5/6$. The goal of this talk is to sketch a proof of this conjectured bound.

This is joint work with Grace McCourt and Mina Nahvi.