VCU Discrete Mathematics Seminar

On intersecting families of independent sets in trees

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Wednesday, Feb. 15
1:00-1:50 EST

Zoom! @ `https://vcu.zoom.us/j/92975799914`
`password=graphs2357`

The Erdős-Ko-Rado Theorem states that, for $r \leqslant n/2$, intersecting families of r-sets have size at most that of a star, which is a family of sets with nonempty intersection. A graph G is r-EKR if intersecting families of independent r-sets of G are maximized by a star. Holroyd and Talbot conjectured that every graph G is r-EKR for all $1 \leqslant r \leqslant \mu(G)/2$, where $\mu(G)$ is the size of the largest independent dominating set. We verified the conjecture for all chordal graphs with isolated vertices, for example, as well as for sparse graphs with $r \leqslant cn^{1/3}$.

While investigating whether trees are r-EKR, we had conjectured that stars of trees are maximized at leaves. We proved this for $r \leqslant 4$, but Borg gave counterexamples for all $r \geqslant 5$. Here we prove that all trees with a unique split vertex satisfy the leaf conjecture, and we characterize their best leaves. We recently showed that all trees whose split vertices have pendant edges satisfy the leaf conjecture. For such trees with exactly two split vertices, we also provide partial results on their best leaves.

For the DM seminar schedule, see:

`https://go.vcu.edu/discrete`