

Discrete Mathematics Seminar

Time: Friday, 3 February 2012, 12:30–1:30 PM
Location: 238 Derrick Hall
Title: Acyclic Subgraphs in k -Majority Tournaments
Speaker: Dr. Jian Shen, Mathematics Department

Abstract:

A k -majority digraph is a directed graph created by combining k individual rankings on the same ground set to form a consensus where edges point in the direction indicated by a strict majority of the rankings. The k -majority digraph is used to model voting scenarios, where the vertices correspond to options ranked by k voters. When k is odd, the resulting digraph is always a tournament, called k -majority tournament. Let $f_k(n)$ be the minimum, over all k -majority tournaments with n vertices, of the maximum order of an induced transitive sub-tournament.

In 2011, Milans, Schreiber, and West proved that $\sqrt{n} \leq f_3(n) \leq 2\sqrt{n} + 1$. [Acyclic sets in k -majority tournaments, *Electronic J. Combin* 18(1) (2011), Paper 122, 7 Pages.] In this talk, we will improve the upper bound of $f_3(n)$ by showing that $f_3(n) < \sqrt{2n} + \frac{1}{2}$. This work was part of a research project done by three high school students (Alexandra Ilic, Lilly Shen, and Bobby Shen) in the summer of 2011 under the supervision of Dr. Jian Shen at Texas State University Mathworks.