

Discrete Mathematics Seminar

Time: Friday, 25 October 2013, 1:00-2:00 PM
Room: 238 Derrick Hall
Title: A Harary-type Theorem for Balanced Oriented Hypergraphs
Speaker: Dr. Lucas Rusnak, Mathematics Department

Abstract:

We say a signed graph is balanced if all circles are positive. Harary's Balance Theorem tells us that an equivalent formulation of balance is that all paths between two vertices must have the same sign. If we extend balance to oriented hypergraphs (as being negative circle-free) Harary's Theorem does not hold. However, if we replace the path condition with the new concept of weak-walks introduced by Reff and Rusnak (2012), we obtain a stronger Harary-type Theorem that characterizes balance. Moreover, this characterization is understood through powers of the Laplacian matrix.

This work was accomplished through Texas State's Mathworks Honors Summer Math Camp, and was done by Siemens Regional Finalists Vinci Chen, Angie Rao, and Alex Yang; mentored by Lucas Rusnak.