TEXAS STATE UNIVERSITY

The rising STAR of Texas

Discrete Mathematics Seminar

Time: Friday, October 20, 2017, 2:15-3:15 PM
Room: 237 Derrick Hall
Title: Natural Generalizations of Graphs Part I: Graphs, Oriented hypergraphs, and
            integer matrices
Speaker: Dr. Lucas Rusnak, Department of Computer Science, Texas State University

Abstract:

An oriented hypergraph is a multi-directed generalization of bidirected graphs, and provides for the natural generalization of graph theoretic concepts through its locally signed graphic structure. In this talk, I will survey natural hypergraphic versions of the (balanced) cycle space, Sachs' Theorem, and the Matrix-tree Theorem. These generalizations allow for a new order-theoretic approach to the Matrix-tree Theorem, as well as provide insight on determinant and permanent bounds. Additionally, the "naturality" discussed serves as a concrete example that will be made formal in Part II with a comparison of graph-like categories.