TEXAS STATE UNIVERSITY

The rising STAR of Texas

Discrete Mathematics Seminar

Time: Friday, September 27, 2019, 2:15-3:15 PM
Room: 330 Derrick Hall
Title: Total Minor Polynomials and Matrix-Tree Theorem for Oriented Hypergraphs
Speaker: Josephine Reynes, Department of Mathematics, Texas State University

Abstract:

Sachs showed that coefficient of the characteristic polynomial of the adjacency matrix of a graph are calculated using cycle covers. We extend this notion to weak cycle covers via closed walk embeddings into the underlying incidence structure and obtain a universal characterization of the all-minors matrix-tree theorem for integer matrices using oriented hypergraphs. In addition, a characterization of the coefficients for the multivariate determinantal and permanental polynomials for both the adjacency and Laplacian matrices is established via the finest possible collection of locally graphic submonic embeddings into the injective closure induced by the subobject classifier. When specialized to degree-k monomials of bidirected graphs, we demonstrate that the trivial activation classes are in one-to-one correspondence with Tutte's k-arborescences.