



The rising STAR of Texas

Discrete Mathematics Seminar

Time: Friday, April 20, 2018, 2:15-3:15 PM
Room: 237 Derrick Hall
Title: Chordal graphs and complexes, with a view towards commutative algebra and data clustering
Speaker: Dr. Anton Dochtermann, Department of Mathematics, Texas State University

Abstract:

A graph is said to be 'chordal' if it has no induced cycles of length 4 or more. Chordal graphs are a widely studied class of combinatorial objects with connections to various algorithmic and structural questions. Chordal graphs have several equivalent formulations including an algebraic characterization due to Froberg: the complement of a graph G is chordal if and only if the 'edge ideal' of G has a 'linear resolution'. This observation lead to several attempts to define higher-dimensional analogues of chordal graphs, extending the algebraic condition to ideals generated in higher degree. We will survey some of these chordal complexes and also discuss a recent result of Culbertson, Guralnik, and Stiller who gave a new characterization of chordal graphs inspired by notions in data clustering. We will describe an algebraic proof of their result and discuss possible generalizations.