

Discrete Mathematics Seminar

Illinois State University

2:00–2:50 pm, September 16

Speaker: Heather Blake, Davidson College

Zero Forcing - The Spread of “Infection” on a Graph

Graphs can be used to track the spread of infection among people. There are many different ways to model how infection spreads, but we examine one particular model, called zero forcing, which has its roots in linear algebra.

We start with a set S of vertices which will be initially infected. Zero forcing is an iterative process in which a vertex v spreads the infection to a neighbor u if v is infected and u is the only uninfected neighbor of v . If S is chosen carefully, it can happen that every vertex of the graph will become infected after a sufficient amount of time. The zero forcing number is the minimum size of such a set S . In the talk, we will examine the zero forcing number of several graph families. We also discuss the zero forcing polynomial and a conjecture about the number of zero forcing sets of various sizes.

