Leaky Forcing on Generalized Petersen Graphs

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In this presentation we discuss a recent variation of zero forcing called leaky forcing.

Zero forcing is a coloring process on a graph that consists of finding a set of vertices (that are initially colored blue) that can observe (color) the entire graph by following this propagation rule: vertices can force (color) a white neighbor to become blue if all other neighbors are blue. The goal is to find the zero forcing number for a graph (the minimum number of initially blue vertices needed to observe (color) the whole graph by repeatedly applying the propagation rule).
Leaky forcing is a fault-tolerant variation of zero forcing where certain vertices (not necessarily initially colored blue) cannot force. The goal, in this context, is to find the leaky forcing number for a graph (the minimum number of initially colored blue vertices needed to observe the whole graph regardless of which small number of vertices can't force).

In this talk, we first discuss some general tools developed to help find the leaky forcing number. Then we present results about upper bounds on leaky forcing number on generalized Petersen graphs.

This is a joint work with Drs. Beth Bjorkman (Wright-Patterson Air Force Base, OH); Lei Cao (Nova Southeastern University, FL); Franklin Kenter (United States Naval Academy, MD), Ryan Moruzzi (California State University, East Bay, CA); Carolyn Reinhart (Swarthmore College, PA), and is part of the AIM Mathematical Research Communities.