

## **Throttling for the Cop versus Robber Game**

Anthony Bonato, Jane Breen, Boris Brimkov, Joshua Carlson, Jesse Geneson\*, Leslie Hogben, Katherine Perry, Carolyn Reinhart, Iowa State University

Meyniel conjectured that the number of cops required to win the cop versus robber game on any connected  $n$ -vertex graph is at most a multiple of the square root of  $n$ . Despite the fact that several families of connected graphs are known to have cop number at least a multiple of the square root of  $n$  and none are known to have higher cop number, the best current upper bound on the cop number of  $n$ -vertex graphs is only slightly sub-linear.

The cop-throttling number of a graph sums the number of cops with the capture time (allowing more cops than the minimal number that can win the graph). Like the cop number, the cop-throttling number was conjectured to be at most a multiple of the square root of  $n$  for any connected  $n$ -vertex graph. We discuss a family of graphs that refute this conjecture, along with bounds on cop-throttling for trees and other families. We also discuss how cop-throttling relates to throttling for positive semi-definite zero forcing and other graph processes.

This abstract is for a talk to be given in the session on research from the GRWC.