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The Good, The Bad, and The Ugly: Minimally Cop Win and Maximally Robber Win Graphs

Cops and robbers is a two-player pursuit and evade game played on discrete graphs. This presentation will investigate the addition and removal of any one edge to change the outcome of the game. In one instance, the removal of any edge will change a cop win game into a robber win game (called minimally cop win). In another instance, the addition of any edge will turn a robber win game into a cop win game (called maximally robber win). Characterizing the former is quite simple. However, characterizing maximally robber win graphs presents many challenges. Our efforts were greatly aided by studying such graphs in the complement, with unexpected results.