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A Data-Centric Approach to Cops and Robbers

Meyniel (1985) conjectured that the cop number of any connected graph G of order n is bounded by $O(\sqrt{n})$. In this talk, I introduce a data-centric approach to explore this conjecture by analyzing key properties of graphs, such as genus, tree-width, and planarity. Using computational techniques and automated planning tools, we filter out trivial Meyniel satisfiable graphs to focus on more complex cases. I will walk through the algorithm we developed, which processes graphs into NETWORKX objects, accumulates properties, and calculates the cop number using a PDDL planner (PLANNING DOMAIN DEFINITION LANGUAGE). I will then discuss how we plan to scale this approach to handle larger datasets.