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Who's gonna catch the Robber? And when?

Pursuit games in graphs have attracted a lot of attention both for their practical motivation and theoretical impact, as many of their variants relate to various width parameters of graphs. We will survey recent results on a Cops & Robber game introduced in 1980s by Nowakowski–Winkler, and by Quilliot.

In this game two players take turns, one moving a group of cops along edges of the graph, the other one moving the robber. The robber gets caught if at some moment he/she is standing in the same vertex as one of the cops. The cops win the game when they catch the robber, the robber wins if he/she can avoid capture indefinitely.

We consider the questions of how many cops are needed to catch the robber in a given graph, or how many steps they need for it. Computational complexity of these questions is studied, as well as extremal results for particular graph classes. Interesting results have been obtained when the speed of the robber is allowed to be higher than the speed of the cops. We conclude with a number of open problems.