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Guarding graphs with small diameter

We discuss the guarding game introduced by Fomin et al. when the cop region is a specific graph class. We show that the guarding number can be found in linear time when the cop region is a complete bipartite graph and the guarding problem is NP-hard when the cop region is a graph of diameter two. We give a 2-approximation algorithm for this case. We prove that the guarding problem is NP-hard when the cop region is a split graph and we introduce a new variant of the guarding game, namely, cops have speed two. The speed two variant of the guarding game is solvable in linear time when the cop region is a split graph but it is NP-hard when the cop region is a graph of diameter 3 and we give a 2-approximation algorithm for this case.

Joint work with Rodica Mihal.