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Cops and Robber with Decoys

We consider a variation of the Cops and Robber game in which the robber side consists of a robber and a decoy which are indistinguishable to the cops except under certain conditions. The cops win when one of them moves onto the same vertex as the actual robber (i.e. not the decoy) after a finite number of moves. The robber can throw the decoy to a neighbouring vertex on any move beyond his first. The decoy disappears after the cops' next move so there is only a single decoy in play at any time. We characterize decoy-copwin graphs in the case where the cop can distinguish between the robber and decoy only when he is on the same vertex as one of them. We also characterize such graphs if the cop can distinguish between the robber and decoy only when he has cornered at least one of them. This is joint work with D. DesRoches, M. Islam, and J. Diamond.