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SECURITY GAME WITH CONCEALED SECURITY SYSTEM

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Abstract.

This paper proposes a new security game with concealed security system. There are two players in the security game, called defender and attacker, and we assume that the defender leads her/his security system, and the attacker follows her/his attacks. Moreover, we assume that the attacker obtains information on the defender's security system incompletely. Then, an optimizing problem for the defender can be formulated to a bi-level programming problem whose solutions are Stackelberg solutions. For finding an optimal response of the attacker for each the defender's security system, we apply Monte Carlo method that gives determinate values from its incomplete information randomly. By using her/his optimal response obtained, we construct a solution method for finding a Stackelberg solution by applying particle swarm optimization with the security game's characteristics. We show its effectiveness of solution method by applying a numerical example of the security game.