Simple motion pursuit differential game of many pursuers and one evader on convex compact set

ABSTRACT

We study a differential game of many pursuers and single evader in nonempty closed bounded convex subset of $\mathbb{R}n$. In this game, all players cannot leave the given set. Control parameters of all players are subjected to geometric constraints. Maximum speeds of all players are equal to 1. Pursuit is said to be completed if geometric position of at least one pursuer coincides with that of the evader. Pursuers try to complete the pursuit. Problem is to find estimate for guaranteed pursuit time. To solve the problem, first, we study the same problem in an n-dimensional cube. Then, we reduce the main problem to the game in the cube. To this end, we use method of fictitious pursuers. In this paper, we improve the estimate for guaranteed pursuit time from O(n3) to O(n2).