

Grigorenko, N. L.

A pursuit problem in many person differential games. (Russian) Zbl 0662.90107
Mat. Sb., N. Ser. 135(177), No. 1, 36-45 (1988).

A general differential game for m pursuers and two evadors is described (the problem formulation follows L. S. Pontryagin); pursuers' strategies have the form $u_i(t) = V_i(t, v_1(t), v_2(t))$ where $v_1(t)$ and $v_2(t)$ are controls of the evadors. Capture of the j -th evador at time t_j implies $z_{ij}(t_j) \in M_{ij}(t_j)$ for some $i \leq m$; here z_{ij} is a state of a system describing the interaction process for the i -th pursuer and the j -th evador, $M_{ij}(t) = M_{ij}^1 + M_{ij}^2(t)$, M_{ij}^1 are linear subspaces, $M_{ij}^2(t)$ are convex compact functions continuous in t . System equations linear in z_{ij} are considered. Sufficient algebraic conditions for two evadors to be captured within a finite time interval are given, and an upper bound for the capture time is deduced. For the case of three pursuers $\dot{x}_i = u_i(t)$, $\|u_i(t)\| \leq 1$, and two evadors $\dot{y}_j = v_j(t)$, $\|v_j(t)\| \leq 1$, it is shown that for any initial position three situations are possible: (a) ensured evasion, (b) capture of one evador, (c) capture of one prescribed evador.

Reviewer: [A.V.Kryazhimskij](#)

MSC:

[91A24](#) Positional games (pursuit and evasion, etc.)
[91A23](#) Differential games (aspects of game theory)
[91A99](#) Game theory

Cited in **1** Review
Cited in **2** Documents

Keywords:

many pursuers; successful capture conditions; sufficient conditions of capture and evasion; two evadors; three pursuers

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