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Multiple Capture of an Evader in the Linear Pursuit Problem on Time Scales

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Abstract—The linear problem of pursuing one evader by a group of pursuers is considered in a finite-dimensional Euclidean space. In a given time scale, the problem is described by a linear system with a simple matrix. The set of admissible controls for each participant is the unit ball centered at the origin. The terminal sets are given convex compact sets. The pursuers use counter-strategies based on information about the initial positions and control prehistory of the evader. Sufficient conditions for the capture of the evader by a given number of pursuers are obtained in terms of the initial positions and parameters of the game. Sufficient evasion conditions are obtained for discrete time scales.

Keywords: differential game, group pursuit, evader, pursuer, multiple capture, timescale.

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