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On a solution of a guarantee optimization problem under the functional constraints on the disturbance. (English) [Zbl 1431.93043](#)

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Summary: The paper deals with a control problem for a dynamical system under disturbances. A motion of the system is considered on a finite interval of time and described by a nonlinear ordinary differential equation. The control is aimed at minimization of a given quality index. In addition to geometric constraints on the control and disturbance, it is supposed that the disturbance satisfies a compact functional constraint. Namely, all disturbance realizations that can happen in the system belong to some unknown set that is compact in the space L_1 . Within the game-theoretical approach, the problem of optimizing the guaranteed result of the control is studied. For solving this problem, we propose a new construction of the optimal control strategy. In the linear-convex case, this strategy can be numerically realized on the basis of the upper convex hulls method. Examples are considered. Results of numerical simulations are given.

MSC:

[93C73](#) Perturbations in control/observation systems

[93C15](#) Control/observation systems governed by ordinary differential equations

[49J15](#) Existence theories for optimal control problems involving ordinary differential equations

[91A80](#) Applications of game theory

Keywords:

control problem; disturbances; functional constraint; optimal guaranteed result; optimal strategy; reconstruction; numerical method

Full Text: [DOI](#)

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