

Differential Games: a New Look at Concepts of Feedback Strategies and Applications to Robust Controller Design

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Abstract

We consider feedback control strategies that counteract, in some optimal sense, disturbances tending to drive the system into forbidden regions of the state space. Various formulations of the design problem are reviewed. Special emphasis is given to controllers obtained by solving a problem of differential games, and the interpretation of such controllers as risk sensitive controllers for exit time problems of stochastic control, in the limit as a small noise parameter tends to zero. We also present some new results, which permit us to interpret notions of generalized feedback control strategies in differential games, required to ensure a saddle point of the game, as classical feedback strategies. The theory is illustrated by an example in process control.