

Uncertain Differential Game with Optimistic Value Criterion

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Abstract. Uncertain differential game investigates interactive decision making of players over time, and the system dynamics can be described by an uncertain differential equation. Instead of using the traditional expected utility criterion, this paper assumes that the players want to optimize the optimistic values of their uncertain utilities, and presents an optimistic value model of uncertain differential game. Moreover, a sufficient condition is established to guarantee a feedback Nash equilibrium of the uncertain differential game. As an application, a resource extraction problem is analyzed by the optimistic value model of uncertain differential game.

Keywords: Uncertain differential game, optimistic value criterion, feedback Nash equilibrium, resource extraction problem