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**Min-max solutions for parametric continuous static game under roughness (parameters in the cost function and feasible region is a rough set).** (English) Zbl 1461.91064

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Summary: Any simple perturbation in a part of the game whether in the cost function and/or conditions is a big problem because it will require a game re-solution to obtain the perturbed optimal solution. This is a waste of time because there are methods required several steps to obtain the optimal solution, then at the end we may find that there is no solution. Therefore, it was necessary to find a method to ensure that the game optimal solution exists in the case of a change in the game data. This is the aim of this paper. We first provided a continuous static game rough treatment with min-max solutions, then a parametric study for the processing game and called a parametric rough continuous static game (PRCSG). In a parametric study, a solution approach is provided based on the parameter existence in the cost function that reflects the perturbation that may occur to it to determine the parameter range in which the optimal solution point keeps in the surely region that is called the stability set of the $1^{st}$ kind. Also the sets of possible upper and lower stability to which the optimal solution belongs are characterized. Finally, numerical examples are given to clarify the solution algorithm.

**MSC:**

91A40 Other game-theoretic models
90C05 Linear programming
90C30 Nonlinear programming



**Keywords:**

continuous static game; rough programming; nonlinear programming; rough set theory; parametric linear programming; parametric nonlinear programming

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