Robust Nash Equilibria and Second-Order Cone Complementarity Problems

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## Abstract:

In this paper we consider a bimatrix game in which the players can neither evaluate their cost functions exactly nor estimate their opponents' strategies accurately. To formulate such a game, we introduce the concept of robust Nash equilibrium that results from robust optimization by each player, and prove its existence under some mild conditions. Moreover, we show that a robust Nash equilibrium in the bimatrix game can be characterized as a solution of a secondorder cone complementarity problem (SOCCP). Some numerical results are presented to illustrate the behavior of robust Nash equilibria.

[This is a joint work with Shunsuke Hayashi and Nobuo Yamashita.]