

An Approximation Scheme for a Class of Generalized Nash Equilibrium Problems with Risk Aversion.

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Resumo/Abstract:

The Generalized Nash Equilibrium problem (GNEP) is an appropriate tool for modeling real-life situations where there are a number of agents with conflicting interests. As a solution to this problem, we are interested mainly in computing the so-called Variational Equilibria (VE) which are distinguished Nash Equilibria that arise as solutions of a Variational Inequality (VI) associated to the GNEP.

In order to obtain more accurate representations of the reality, it is often necessary to include stochastic information in the model. This feature makes more challenging the VI associated to the game, that now is of larger size and has a multivalued operator. Indeed, the risk-measures used by the agents to hedge against volatility makes their problems nondifferentiable and yields a multivalued VI.

We present a family of approximating single-valued VIs, associated to approximating GNEPs with agents hedging risk with smoothed measures. The corresponding approximate VE converge to a variational equilibrium of the game. Moreover, since the approximating VIs are associated to GNEPs, they are amenable to decomposition techniques, making it possible to overcome the size increase resulting from the stochastic representation.

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