

Game Theory

Applied Mathematics Employed for Collaboration in the Presence of Challenges, Rapid Changes and Uncertainty

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Game Theory has a long tradition in economics and operational research. In the last years, real-world challenges in the areas of, e.g., environmental protection, development and new markets asked for a more intensive employment of modern methods from mathematics, such as combinatorics, linear and nonlinear optimization, optimal control, dynamical systems and statistical learning. These areas will support and host our project.

In these years of globalization and rapid changes, common challenges by earth warming, fossile energy resources but also water becoming less, etc., the concerted efforts of collaboration are needed for a future of mankind, appropriate living conditions of future generations, for justice, freedom and peace. The overcoming of antagonisms, conflicts and particular kinds of trade-offs are subjects of cooperative game theory. How can mathematics model “fairness” and “bargaining”? Can answers to these questions be given also in a dynamical and adaptive time sense? And how can the imprecision and uncertainty, in information, technology - even in modern high-tech, in the interrelations between human beings and societies, in the individual and joint decision makings as well, become represented and implemented into such a “game”?

This project wants to find some answers in the context of these questions. We ask for a generalization of the given more classical game theory, for an employing of interval concepts, dynamical, network and matrix models, of control theory and elements of learning theory.

You are cordially welcome!

Collaborators:

External Partners:

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