

Mauro PASSACANTANDO

Network games with bounded strategies: properties, algorithms, extensions.

Network games are a class of non-cooperative games useful for modeling social and economic interactions among various agents whose connections are described with the help of graph-theoretical notions. Specifically, agents (players) are identified with the nodes of a graph and can interact only with the players directly connected through an arc. A characteristic of this kind of games is that the adjacency matrix of the underlying graph plays a central role in the utility functions of players.

In this talk, we focus on a class of network games with linear-quadratic utility functions and bounded strategy sets. First, some theoretical properties of Nash equilibria are presented: existence, uniqueness and a representation formula based on the Katz-Bonacich centrality measure. Next, we propose a solution algorithm based on the sequential solution of linear systems of equations and we prove that it finds the exact Nash equilibrium after a finite number of iterations. Experimental results show the efficiency of the algorithm in solving large scale problems. Finally, extensions of the considered model to Generalized Nash Equilibrium Problems on networks and network games with random utility functions are discussed.

Giandomenico MASTROENI

Optimality conditions for quadratic optimization problems with quadratic cone constraints

We consider a quadratic programming problem with quadratic cone constraints and an additional geometric constraint. We establish necessary and sufficient conditions for optimality of a KKT point under suitable assumptions, using, in particular, strong duality as a regularity condition. We consider in details the case where the feasible set is defined by two quadratic equality constraints and we outline some possible applications to quadratically constrained variational inequalities or to equilibrium problems