GAMENET2019 Invited talks: Titles & Abstracts

Cseh, Ágnes

Title: Pareto optimal coalitions of fixed size

joint work with Tamás Fleiner and Petra Harján

Abstract:

We tackle the problem of partitioning players into groups of fixed size, such as allocating eligible students to shared dormitory rooms. Each student submits preferences over the other individual students. We study several settings, which differ in the size of the rooms to be filled, the orderedness or completeness of the preferences, and the way of calculating the value of a coalition---based on the best or worst roommate in the coalition. In all cases, we determine the complexity of deciding the existence, and then finding a Pareto optimal assignment, and the complexity of verifying Pareto optimality for a given assignment.

Michal Feldman

Title: Auction design under interdependent values

Abstract:

We study combinatorial auctions with interdependent valuations. In such settings, every agent has private signal, and every agent has a valuation function that depends on the private signals of all the agents. Interdependent valuations capture settings where agents lack information to determine their own valuations. Examples include auctions for artwork or oil drilling rights. For single item auctions and assume some restrictive conditions (the so-called single-crossing condition), full welfare can be achieved. However, in general, there are strong impossibility results on welfare maximization in the interdependent setting. This is in contrast to settings where agents are aware of their own valuations, where the optimal welfare can always be obtained by an incentive compatible mechanism. Motivated by these impossibility results, we study welfare maximization for interdependent valuations through the lens of approximation. We introduce two valuation properties that enable positive results. The first is a relaxed, parameterized version of single crossing; the second is a submodularity condition over the signals. We obtain a host of approximation guarantees under these two notions for various scenarios.

Edith Elkind

Title: Hedonic diversity games.

based on joint work with Ayumi Igarashi, Robert Bredereck and Niclas Boehmer.

Abstract:

We consider a coalition formation setting where each agent belongs to one of the two types, and agents' preferences over coalitions are determined by the fraction of the agents of their own type in each coalition. This setting differs from the well-studied Schelling's model in that some agents may prefer homogeneous coalitions, while others may prefer to be members of a diverse group, or a group that mostly consists of agents of the other type. We model this setting as a hedonic game and investigate the existence of stable outcomes using hedonic games solution concepts, such as Nash stability, individual stability and core stability. In particular, we establish that every hedonic diversity game admits an individually stable solution, and such solutions can be computed in polynomial time.

Penélope Hernández

Title: **How Bayesian persuasion can help reduce illegal parking and other socially undesirable behavior**

by Penélope Hernández and Zvika Neeman

Abstract:
We consider the question of how best to allocate enforcement resources across different locations with the goal of deterring unwanted behaviour. We rely on “Bayesian persuasion” to improve deterrence. Our approach is distinguished by the following five features: (1) we consider a problem in which the principal has to allocate resources and then send messages (persuade) rather than just persuade. (2) Messages are received by drivers in n different neighborhoods, so persuasion is with respect to multiple audiences. (3) The problem is a “constrained convexification” rather than just a convexification problem, where the constraints are due to resource and probability restrictions. This implies that convexification may be partial rather than complete as is usually the case in Bayesian persuasion models. (4) Even though the basic problem is not linear, we show that it can be cast as a linear programming problem. Finally, (5) we characterize the number of messages needed in order to obtain the optimal solution, and describe conditions under which it is possible to explicitly solve the problem with only two messages.

Catherine Rainer

Title: **Solving two-state Markov games with incomplete information on one side**

joint work with Galit Ashkenazi-Golan and Eilon Solan

Abstract: We study the optimal use of information in Markov games with incomplete information on one side and two states. We provide a finite-stage algorithm for calculating the limit value as the gap between stages goes to 0, and an optimal strategy for the informed player in the limiting game in continuous time. This limiting strategy induces an $\ep$-optimal strategy for the informed player, provided the gap between stages is small.