York Annual Symposium on Game Theory 2012

18-19 June 2012

Keynote Speakers:

Youngsub Chun (Seoul)
Matthew O. Jackson (Stanford)
Inés Macho-Stadler (UAB)
Hans Peters (Maastricht)

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Programme

18-19 June 2012 • ARRC Auditorium (R/C/014), University of York

Day 1: Monday 18 June 2012

09:00   Welcome

09:10   **Inés Macho-Stadler**: Sharing the surplus in games with externalities within and across issues

10:10   Break (Coffee and Tea)

10:30   **Makoto Shimoji**: Theoretical approaches to lowest unique bid auctions

   Paul Schweinzer: Labelling contests with endogenous precision

   David Pérez-Castrillo: Innovation contests

12:15   Lunch

13:45   **Jens Gudmumdsson**: A competitive partnership formation process

   Victoria Brosi: An analysis of mixed member proportional rule from an aggregation perspective

   Yukihiko Funaki: An experimental study of a double-track auction

15:30   Break

15:50   **Jiawen Li:** A non-cooperative interpretation of the Talmud solution for bankruptcy problem

   René van den Brink: Cooperative games on accessible union stable systems: hierarchy and communication restrictions

17:00   Break (Coffee and Tea)

17:20   **Youngsub Chun**: Subgroup additivity in the queueing problem

18:30   Departure for Symposium Dinner

Day 2: Tuesday 19 June 2012

09:10   **Hans Peters**: On the efficient and strategy-proof location of public bads

10:10   Break (Coffee and Tea)

10:30   **Anindya Bhattacharya**: Choosing to be an irresponsible parent: asymmetric equilibria in the presence of partial social insurance

             Tommy Andersson: House allocation under rent control

11:40   Break

12:00   **Matthew O. Jackson**: Diffusion of microfinance

13:00   Farewell Lunch

Abstracts

Inés Macho-Stadler (joint with E. Diamantoudi, D. Pérez-Castrillo and L. Xue): Sharing the surplus in games with externalities within and across issues

We consider issue-externality games in which agents can cooperate on multiple issues and externalities are present both within and across issues. We propose a way to extend (Shapley) values for partition function games to issue-externality games. We characterize our proposal through axioms that extend the Shapley axioms to our more general environment.

Makoto Shimoji (joint with M. Costa-Gomes): Theoretical Approaches to Lowest Unique Bid Auctions

In this paper, we use weak dominance to identify the upper bound of a player's bid in the lowest unique bid auction. This result extends to more general settings such as multiple-bid and incomplete information. When players have the same value, we show how a symmetric equilibrium mixed strategy can be computed using the recursive structure of the winning chances for the bids under one assumption. We also provide numerical examples to address practical issues.

Paul Schweinzer (joint with P. Fleckinger and B. Roussillon): Labelling contests with endogenous precision

This paper introduces a novel type of imperfectly discriminatory contest which endogenises the cost of compiling the relative ranking it is based on. As a first application, we propose a simple theory of labelling for credence or experience goods of differing quality. We model the competition for the first, second, etc. labels as a rank order tournament in which firms can jointly control the ranking precision through the release of individual information. This information may be interpreted as endogenously established (input for) labelling agencies, experts or regulatory bodies. While the labels can be seen as a public good guiding the consumers' purchasing decisions, individual firms have incentives to free ride on the competitors' information emission. The theory seems to be applicable to many industries including advertising, investment rating, the production (and pirating) of computer software, movies or music, etc.

David Pérez-Castrillo (join with D. Wettstein): Innovation contests

We study innovation contests with asymmetric information and identical agents, where contestants' efforts and innate abilities generate inventions of varying qualities. The designer offers a reward to the contestant achieving the highest quality and receives the revenue generated by the innovation. We characterize the equilibrium behavior, outcomes and payoffs for both nondiscriminatory and discriminatory (where the reward is

agent-dependent) contests. We derive conditions under which discrimination is optimal and describe settings where they are satisfied.

Jens Gudmumdsson (joint with T. Andersson, D. Talman and Z. Yang): A competitive partnership formation process

A number of heterogeneous but well-informed agents (or firms) wish to form joint ventures in partnership. Joint ventures generate joint revenues. The joint revenue must be divided completely among the agents involved in the joint venture. Every agent has to consider both whether to act independently or to partner someone and how to share the joint revenue with his partner. In equilibrium, no agents have incentive to break up or to form new partnerships. It has been shown that there is a competitive equilibrium under general conditions which are easily satisfied by the well-known assignment markets. In this paper we propose a dynamic competitive adjustment process that always either finds an equilibrium or exclusively proves the nonexistence of equilibrium in finite time. When an equilibrium is found, partnership and revenue distribution will be automatically and endogenously determined. Moreover, several fundamental properties of the equilibrium solution are derived.

Victoria Brosi: An analysis of mixed member proportional rule from an aggregation perspective

This paper analyzes some properties of the mixed member proportional rule for electing a parliament (and it uses the institutional features of the German parliamentary election system as a specific case of the rule). This rule that we study is a particular mixture of the proportional rule and the plurality rule designed, presumably, to improve upon the parent rules. However, first we show that there are preference profiles for which the parent rules satisfy some desirable properties which the mixed rule fails to satisfy: for example, a kind of monotonicity and a kind of invariance. Next we show that there are limitations of the parent rules that the mixed rule cannot remedy: for example, the rule does not always pick the Condorcet winner even when it exists and that it occasionally picks a Condorcet loser.

Yukihiko Funaki: An experimental study of a double-track auction

Jiawen Li (joint woth Y. Ju): A non-cooperative interpretation of the Talmud solution for bankruptcy problem

The paper devotes to the non-cooperative study of bankruptcy problems. A simple multi-period strategic game is proposed for claimants to negotiate and divide the underlying estate. It is shown that all subgame perfect equilibria of the game yields the same outcome that coincides with the Talmud solution of the corresponding bankruptcy problem. We then analyze a modified game such that it has a unique subgame perfect

equilibrium and it leads to the Talmud solution. We also study simple variations of the bargaining protocol to implement the constrained equal award rule, constrained equal loss rule, as well as the reverse Talmud solution. Moreover, a generalization of the strategic approach to surplus sharing problem is discussed.

René van den Brink (joint with E. Algaba and C. Dietz): Cooperative games on accessible union stable systems: hierarchy and communication restrictions

Set systems that can be obtained as a set of connected coalitions in an undirected communication graph, are characterized by (i) containing the empty set, (ii) being union stable (meaning that the union of every pair of feasible coalitions that are not disjoint is also feasible), and (iii) satisfying 2-accessibility (meaning that for every feasible coalition with at least two players, there are at least two players such that without any of these two players the remaining coalition is still feasible). This makes them comparable with antimatroids being set systems that are defined by (i) containing the empty set, (ii) being union closed (meaning that the union of every pair of feasible coalitions is also feasible), and (iii) satisfying accessibility (meaning that for every nonempty feasible coalition there is at least one player such that without this player the remaining coalition is still feasible). Since every set system that satisfies union closedness satisfies union stability, and every set system that satisfies 2-accessibility satisfies accessibility, the sets of connected coalitions in a communication graph (called communication feasible sets) and antimatroids are thus characterized by similar properties, where antimatroids satisfy a stronger union property, and communication feasible sets satisfy a stronger accessibility property.
In this paper we combine the weaker of each type of axiom, and introduce accessible union stable systems, being set systems that are defined as (i) containing the empty set, (ii) being union stable, and (iii) satisfying accessibility. We provide results on these structures (for example, we characterize their dual systems as a class containing the convex geometries), and on their supports (being those feasible coalitions that are not the union of two non disjoint feasible coalitions). After that we consider cooperative games with restricted cooperation where the set of feasible coalitions is given by an accessible union stable system. This generalizes, a.o. the communication graph games of Myerson (1977) and games on antimatroids studied by Algaba, Bilbao, van den Brink and Jimenez-Losada (2003, 2004). We consider the solution that assigns to every game on an accessible union stable system the Shapley value of a restricted game where the worth of every coalition equals the sum of the worths of its components in the structure, and provide an axiomatic characterization.

Youngsub Chun (joint with M. Mitra): Subgroup additivity in the queueing problem

We introduce 'subgroup additivity' as our main axiom and investigate its implications for the queueing problem. The axiom of subgroup additivity requires that a rule assigns the same expected 'relative' utility to each agent whether an agent's expected relative utility is calculated from the problem involving all agents or from its sub-problems with a smaller number of agents. As a result, we present characterizations of five important rules in the queueing problem: the minimal transfer rule, the maximal transfer rule, the symmetrically balanced VCG rule, the pivotal rule and the reward based pivotal rule. Given some basic axioms and subgroup additivity, the characterization results can be obtained by additionally imposing either strategic axioms (like weaker versions of strategyproofness) or equity axioms (adjusted versions of egalitarian equivalence). Each strategic axiom can be replaced by an appropriate equity axiom for the characterization of all five rules.

Hans Peters (joint with Murat Öztürk and Ton Storcken): On the efficient and strategy-proof location of public bads

A finite number of agents has to agree on the location of a public bad, such as a garbage dumping place or a nuclear plant, in a certain area (city, province, state or country). Formally, we focus on compact convex subsets of the plane – mostly convex polygons – on which each agent has a single-dipped Euclidian preference. A social choice function assigns a point (the location of the public bad) to each profile of preferences. We impose Pareto optimality and strategy-proofness and for each convex polygon obtain an (essentially) complete characterization of all social choice functions satisfying these two conditions.

Anindya Bhattacharya (joint with S. Chattopadhyay): Choosing to be an irresponsible parent: asymmetric equilibria in the presence of partial social insurance

Consider a society of ex-ante identical individuals whose procreation decisions are determined by their own consumption, the cost of having a child and the vicarious utility from the consumption of the child (if procreated). The child's consumption is a lottery which may get adversely affected if the parent, motivated by a higher intensity of pleasure, chooses an irresponsible/self-indulgent lifestyle. Suppose there is a social norm that redistributive compensation, which is required to be ex-post feasible, is provided to children in low consumption states. We show that the introduction of such compensation schemes can lead to asymmetric equilibrium strategic choices, i.e., procreation decisions change upon the introduction of the scheme, and a person leads an irresponsible life in equilibrium precisely because another person leads a responsible one and vice versa.

Tommy Andersson (joint with L.-G. Svensson): House allocation under rent control

This paper investigates the problem of allocating a number of indivisible objects among a group of agents when restrictions are imposed on the prices, e.g., due to legislation, binding agreements, collective bargaining etc. Because the set of equilibrium prices may be empty, given such constraints, the concept of equilibrium is weakened. An allocation mechanism with an incorporated rationing method that captures the specific feature "weakly competitive" markets is investigated. A number of properties of this allocation rule are stated and the main result demonstrates that the allocation rule is strategy-proof.

Matthew O. Jackson (joint with A. Banerjee, A. Chandrasekhar, and E. Duflo): Diffusion of microfinance

We examine how participation in a microfinance program diffuses through social networks, using detailed demographic, social network, and participation data from 43 villages in South India. We exploit exogenous variation in the importance (in a network sense) of the people who were first informed about the program, the ``injection points.'' Microfinance participation is significantly higher when the injection points have higher eigenvector centrality. We also estimate structural models of diffusion that allow us to (i) determine the relative roles of basic information transmission versus other forms of strategic effects and peer influence, and (ii) distinguish information passing by participants and non-participants. We find that participants are significantly more likely to pass information on to friends and acquaintances than informed non-participants. However, information passing by non-participants is still substantial and significant, accounting for roughly one-third of informedness and participation. We also find that, once we have properly conditioned on an individual being informed, her decision to participate is not significantly affected by the participation of her acquaintances.