

Workshop on Advancements in Social Choice

Université de Lausanne – September 15, 2017

All talks take place in building Extranef, Room 125: 45 minutes for each talk, 15 minutes for discussions.

9.00 am - 10.00 am	Battal Dogan, University of Lausanne, Lausanne, Switzerland “On acceptant and substitutable choice rules” (joint with Serhat Dogan and Kemal Yildiz)
10.00 am - 10.30 am	Coffee break
10.30 am - 11.30 am	Sidarta Gordon, Université Paris-Dauphine/PSL, Paris, France “Strategy-proof provision of two public goods: the Lexmax extension “ (joint with Lars Ehlers)
11.30 am - 12.30 pm	Panos Protopapas, University of Lausanne, Lausanne, Switzerland “On strategy-proofness and single-peakedness: median-voting over intervals”
12.30 pm - 2 pm	Lunch
2 pm – 3:00 pm	Herve Moulin, University of Glasgow, Glasgow, Scotland “Fair mixing” (joint with Haris Aziz and Anna Bogomolnaia)
3.00 pm – 3:30 pm	Coffee break
3.30 pm - 4.30 pm	Clemens Puppe, Karlsruhe Institute of Technology, Karlsruhe, Germany “The single-peaked domain revisited: a simple global characterization”
4:30 pm – 5:30 pm	Arunava Sen, Indian Statistical Institute, New Delhi, India “Implementation in undominated strategies by bounded mechanisms: The Pareto correspondence and a generalization” (joint with Saptarshi Mukherjee, Nozomu Muto, and Eve Ramaekers)
7 pm	Workshop Dinner for speakers and local organizers.

Abstracts

Battal Dogan, On acceptant and substitutable choice rules: Each acceptant and substitutable choice rule is known to have a collected maximal representation: there exists a list of priority orderings such that from each choice set that includes more elements than the capacity, the choice is the union of the priority orderings' maximizers (Aizerman and Malishevski, 1981). We introduce the notion of a prime atom and constructively prove that the number of prime atoms of a choice rule determines its smallest size collected maximal representation. We show that responsive choice rules require the maximal number of priority orderings in their collected maximal representations among all acceptant and substitutable choice rules. We characterize collected maximal choice rules in which the number of priorities equals the capacity. We also show that if the capacity is greater than three and the number of elements exceeds the capacity by at least two, then no acceptant and substitutable choice rule has a collected maximal representation of the size equal to the capacity.

Sidarta Gordon, Strategy-proof provision of two public goods: the Lexmax extension: This paper studies the problem of providing two public goods for agents with single-peaked preferences. A decision rule selects two points on the segment $[0,1]$ for the public goods, for every profile of reported preferences. Agents compare public good pairs by the lexmax ordering over pairs induced by their single-peaked preference over single locations. We derive implications of strategy-proofness in this setting and compare them with those in the model with one public good and in the model with two public goods under the max extension. We characterize the class of decision rules satisfying strategy-proofness, anonymity and continuity with respect to preferences. We also characterize subclasses of rules that satisfy additional properties.

Clemens Puppe, The single-peaked domain revisited: a simple global characterization: It is proved that, among all restricted preference domains that guarantee consistency (i.e. transitivity) of pairwise majority voting, the single-peaked domain is the only minimally rich and connected domain that contains two completely reversed strict preference orders. It is argued that this result explains the predominant role of single-peakedness as a domain restriction in models of political economy and elsewhere. The main result has a number of corollaries, among them a dual characterization of the single-dipped domain; it also implies that a single-crossing ('order-restricted') domain can be minimally rich only if it is a subdomain of a single-peaked domain. The conclusions are robust as the results apply both to domains of strict and of weak preference orders, respectively.

Panos Protopapas, On strategy-proofness and single-peakedness: median-voting over intervals: We consider the problem of choosing an interval of alternatives when agents have single-peaked preferences. Similar to Klaus and Storcken (2002), we ordinally extend these preferences over intervals. Loosely speaking, we extend the results of Moulin (1980) to solutions and show that other related results do not hold in this setting. Our main results show the following. First, strategy-proofness and peaks-onliness characterize the class of generalized median solutions; second, strategy-proofness, peaks-onliness, and anonymity, characterize the class of median solutions; and finally, in these results peaks-onliness cannot be replaced by the "weaker" property of continuity, as has been shown for rules (Ching, 1997).

Herve Moulin, Fair mixing: Budgetary participation (Cabannes 2004) is a growing form of democratic collective decision making eliciting citizens' (employees', club members') input into which subset of public projects the community (firm, club) should implement. A stylized version of this process is an instance of probabilistic voting, but with an interpretation significantly different than standard voting. In the latter, randomization of the final decision is second best to the first best of a deterministic outcome. By contrast in our model the selection of a single (deterministic) public outcome is typically ruled out as unfair, and a proper mixture of outcomes must strike a fair compromise between heterogeneous preferences. The "mixture" of outcomes may come from an actual lottery, or a allocation of time-shares, or the distribution of a fixed amount of resources over these outcomes.

For instance we must schedule a weekly meeting (of a gym class, a choir, a chess club) but the members of the group are only free to attend certain days at certain hours: the meeting time can change in some weeks to accommodate individual constraints. The local public TV chooses the time-shares of broadcast in different languages, or different types of program (news, music, movies). In the fair knapsack problem, the server randomly schedule jobs of different sizes under a capacity constraint: this allows to relate the expected delays of a job to its size. The city authority must divide funds or staff between several geographically dispersed facilities (libraries, hospitals), taking into account the citizens' travel costs to those facilities.

On the one hand we must listen to the will of the majority, which means that more support for a public good should imply a bigger share for that good; on the other hand we must protect minorities whose idiosyncratic preferences are not satisfied by the popular goods. In the knapsack example, the server wants to favour short jobs, but cannot ignore long jobs entirely; similarly the meeting will be scheduled most often, but not always, when many members of the club can attend; and so on.

We discuss this tradeoff when preferences can be represented in a very simple Facebook-style dichotomous form: each agent likes or dislikes each outcome, and her utility is simply the total share of her likes. In the knapsack problem this is the plausible assumption that agents care only about their expected service time; similarly in the scheduling example where they care only about the number of yoga classes they can attend. Though less natural in the public TV and the library funding examples, because they rule out any complementarities between outcomes, dichotomous preferences are still of practical interest because they are easy to elicit.

Our results. We consider a sequence of normative properties which lead us to recommend two familiar decision rules for our problem: the Nash bargaining solution (maximizing the product of utilities) and the Random Priority solution (averaging all deterministic priority outcomes).

Fairness properties postulate that each individual agent "owns" a fair share of decision power, and extend this principle to subgroup of agents.

Incentive compatibility properties include Participation, and Strict Participation, requiring that each agent is (weakly or strictly) worse off by not reporting his preferences; and two versions of Strategyproofness, the weaker version allowing to exclude agents from consuming the goods they claim to dislike.

The Nash solution meets all requirements except both versions of Strategyproofness, while Random Priority can be badly inefficient in the worst case, but meets essentially all other properties.

Arunava Sen, Implementation in undominated strategies by bounded mechanisms: the Pareto correspondence and a generalization: We show that the Pareto correspondence can be implemented in weakly undominated strategies by bounded mechanisms. This resolves a question raised in Boergers (1991). The result is also extended to show that all social choice correspondences satisfying tops-inclusivity and a requirement called the seconds-property can be implemented.