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Supermodular Bayesian Implementation: Learning and Incentive Design

This paper examines the problem of designing mechanisms with learning properties that help guide agents to play desired equilibrium strategies. I introduce the concept of supermodular implementation where the mechanisms are constructed to induce supermodular games, i.e games with strategic complementarities. These supermodular mechanisms receive the valuable characteristics of supermodular games such as their learning properties. A social choice function (scf) is supermodular implementable if it is implementable with a supermodular mechanism. In quasilinear environments, I prove that if a scf can be implemented by a mechanism that generates bounded strategic substitutes - as opposed to strategic complementarities - then this mechanism can be converted into a supermodular mechanism that implements the scf. If the scf also satisfies some efficiency criterion, then I show that it is supermodular implementable with budget-balancing transfers. Then I address the multiple equilibrium problem. I provide general sufficient conditions for a scf to be implementable with a supermodular mechanism whose equilibria are contained in the smallest interval among all supermodular mechanisms. I also give conditions for supermodular implementability in unique equilibrium. Finally, the paper deals with general preferences by providing a Supermodular Revelation Principle.