

Incentive-Compatible Cost-Sharing Mechanism Design – Collectors' Happiness

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Abstract

We consider the traditional economic situation where n players are competing for a service. A standard working assumption is that an agent is indifferent to receiving the service for the maximum price he is willing to pay or not receiving the service at all.

In this work we introduce and look at "collector utilities" which model the alternative situation where players still prefer receiving the service for their maximum price (compared to not receiving it). We obtain the following results with regard to collector utilities:

- We present a generic cost-sharing mechanism which is group-strategyproof and budget-balanced for every cost function.
- There is a rich class of cost functions for which this mechanism is $2H_n$ -efficient. This class includes the widely studied submodular cost functions as well as scheduling makespan cost.
- Although the standard implementation of the mechanism takes exponential time to compute, there are two interesting classes of cost functions that allow polynomial-time computation: Symmetric cost functions and $(1 + \varepsilon)$ -approximate makespan functions.