

INCENTIVES: A MULTIDISCIPLINARY APPROACH

The problem of implementation is defined as follows: given a set of desired results for different states of the world (in the form of a social choice rule) design a game form (or mechanism) such that autonomous, rational, and maximising own utility agents (or players) will have incentives to make individual choices that lead to socially desirable outcomes, e.g. those that maximise social welfare. A simple example of mechanism is the second price auction (widely used in Internet auctions such as allegro or e-bay). It incentivises the buyers to submit bids that are equal to their valuation of the object. Another example are on-line scoring systems motivating the users to submit truthful scores, or facility location mechanisms used to choose locations that are most convenient for the citizens.

Information is of key importance when creating incentivising mechanisms is concerned. On the one hand there is the problem of information asymmetry, resulting from the fact that the mechanism designer does not know the state of the world, which is partially or fully known to the agents. On the other hand, the agents might have information that exceeds the knowledge of their private state. An example of such a scenario are social networks, where agents share information with their neighbours in the network. Social networks create a completely new tool for creating incentives for the agents. For example, individual decisions about whether to vaccinate or not affect the risk of infection to other agents and, in effect, affect their decisions about vaccination.

How to use additional sources of information to create mechanisms motivating agents to choose the desired outcomes? How to utilize social networks, where neighbouring agents share information about their internal state? Which network topologies create incentives to make more desirable choices? How to automate the process of constructing the best and the simplest mechanisms? These are the questions that our project will attempt to give answers to.

We are going to address these questions using the rigorous methods of theoretical economics, combining them with methods of theoretical computer science and with use of computational tools. The outcomes of our research will, on one side, have the nature of formal results describing mechanisms or network topologies and their properties. On the other side, the proposed methods of incentivising agents will be tested with use of rigorous methods of economic experiments.