

## Some Developments in Implementation Theory

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I take up three recent works of mine in implementation theory. The first work to be discussed is “Maskin Meets Abreu and Matsushima,” which revisits the classical Nash implementation problem by making use of lottery and monetary transfer. This paper’s results possess a number of appealing features: finite mechanisms (with no integer or modulo games) are used; mixed strategies are handled explicitly; neither transfer nor bad outcomes are used on the equilibrium path; the mechanism is robust to information perturbations; the size of off-equilibrium transfers can be made small; and the mechanism is extended to infinite/continuous settings and ordinal setting.

The second work is “Rationalizable Implementation of Correspondences,” which adopts a more robust solution concept of rationalizability than Nash equilibrium. We identify uniform monotonicity as a necessary and almost sufficient condition for implementation in rationalizable strategies. Uniform monotonicity is much weaker than Maskin monotonicity and reduces to it in the case of functions. Maskin monotonicity, the key condition for Nash implementation, had also been shown to be necessary for rationalizable implementation of social choice functions. In conclusion, the conditions for rationalizable implementation are not only starkly different from, but also much weaker than those for Nash implementation, when we consider social choice “correspondences.”

The third work is “Continuous Implementation with Small Transfers.” This work is distinct from the previous two works in two respects. First, this paper investigates an incomplete information environment, while the other two works deal with complete information environments. Second, this paper investigates “partial” implementation, whereas the other two papers consider full implementation. We say that a social choice function is continuously implementable with small transfers if it is partially implementable for types in the initial model and it continues to be so for types close to the initial model by a mechanism in which small transfers are added to both on and off the equilibrium. When a generic correlation condition is imposed on the class of interdependent values environments, any incentive compatible social choice function is continuously implementable with small transfers.