On the Structure of Informationally Robust Optimal Mechanisms

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Abstract :
We study the design of optimal mechanisms when the designer is uncertain about the information held by the agents and about which equilibrium will be played. The *guarantee* of a mechanism is the minimum of the designer's welfare across all information structures and equilibria. The *potential* of an information structure is the maximum welfare across all mechanisms and equilibria. We formulate a pair of linear programs that upper bound the maximum guarantee across all mechanisms and lower bound the minimum potential across all information structures. In applications to public goods, bilateral trade, and optimal auctions, we use the bounding programs to characterize guarantee-maximizing mechanisms and potential-minimizing information structures and show that the max guarantee is equal to the min potential.