

The Simple Economics of Approximately Optimal Auctions

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ABSTRACT

The intuition that profit is optimized by maximizing marginal revenue is a guiding principle in microeconomics. In the classical auction theory for agents with quasi-linear utility and single dimensional preferences, Bulow and Roberts (1989) show that the optimal auction of Myerson (1981) is in fact optimizing marginal revenue. In particular Myerson's virtual values are exactly the derivative of an appropriate revenue curve.

This paper considers mechanism design in environments where the agents have multi-dimensional and non-linear preferences. Understanding good auctions for these environments is considered to be the main challenge in Bayesian optimal mechanism design. In these environments maximizing marginal revenue may not be optimal, and furthermore, there is sometimes no direct way to implementing the marginal revenue maximization mechanism. Our contributions are two fold: we give procedures for implementing marginal revenue maximization in general, and we show that marginal revenue maximization is approximately optimal. Our approximation factor smoothly degrades in a term that quantifies how far the environment is from an ideal one (i.e., where marginal revenue maximization is optimal).