Auction Design under Interdependent Values

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Abstract

We consider a setting where an auctioneer sells a single item to n potential agents with interdependent values. This captures settings such as valuations for artwork, oil drilling rights, and broadcast rights. All previous work on interdependent values assumed a so-called single-crossing condition, which is a crucial property that enables positive results. Without single-crossing, an efficient outcome cannot be obtained. Motivated by this, we study welfare maximization for interdependent valuations through the lens of approximation. We introduce two valuation properties that enable positive results. The first is a relaxed, parameterized version of single-crossing; the second is a submodularity condition over the signals. We obtain a host of approximation guarantees under these two notions.

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