

Approximately Optimal Mechanism Design via Differential Privacy  
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## ABSTRACT

In this paper we study the implementation challenge in an abstract common values model and an arbitrary social welfare function. We design a mechanism that allows for approximate optimal implementation in ex-post Nash equilibrium. If, furthermore, values are private then the same mechanism is strategy proof.

We cast our results onto two specific models: pricing and facility location. The mechanism we design is optimal up to an additive factor of the order of magnitude of the square root of the optimum and involves no utility transfer.

Underlying our mechanism is a lottery between two auxiliary mechanisms - with high probability we actuate a random mechanism that reduces players influence on the choice of the social alternative, while choosing the optimal outcome with high probability. With the complementary probability we actuate a mechanism that is possibly sub-optimal but is incentive compatible. The joint mechanism inherits the desired properties from both.

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