

Robust Repeated First Price Auctions

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We study dynamic mechanisms for optimizing revenue in repeated auctions, that are robust to heterogeneous forward-looking and learning behavior of the buyers. Typically it is assumed that the buyers are either all myopic or are all infinite lookahead, and that buyers understand and trust the mechanism. These assumptions raise the following question: is it possible to design approximately revenue optimal mechanisms when the buyer pool is heterogeneous? We provide this fresh perspective on the problem by considering a heterogeneous population of buyers with an unknown mixture of k -lookahead buyers, myopic buyers, no-regret-learners and no-policy-regret learners. Facing this population, we design a simple state-based mechanism that achieves a constant fraction of the optimal achievable revenue.¹

CCS Concepts: • **Theory of computation** → **Algorithmic mechanism design; Computational pricing and auctions.**

Additional Key Words and Phrases: repeated auctions, dynamic auctions, no-regret learning, lookahead buyers

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¹Full version of the paper: <https://arxiv.org/abs/1906.03286>

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