Non-clairvoyant Dynamic Mechanism Design*

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Despite their better revenue and welfare guarantees for repeated auctions, dynamic mechanisms have not been widely adopted in practice. This is partly due to the complexity of their implementation as well as their unrealistic use of forecasting for future periods. We address these shortcomings and present a new family of dynamic mechanisms that are simple and require no distribution knowledge of future periods.

This paper introduces the concept of non-clairvoyance in dynamic mechanism design, which is a measure-theoretic restriction on the information that the seller can use. A dynamic mechanism is non-clairvoyant if the allocation and pricing rule at each period does not depend on the type distributions in future periods.

We develop a framework (bank account mechanisms) for characterizing, designing, and proving lower bounds for dynamic mechanisms (clairvoyant or non-clairvoyant). This framework is used to characterize the revenue extraction power of non-clairvoyant mechanisms with respect to mechanisms that are allowed unrestricted use of distributional knowledge.

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

Keywords: Dynamic mechanism design; bank account mechanisms; non-clairvoyance; dynamic auctions; approximations; Internet advertising

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