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Presentation Title

A Universal Dynamic Auction for Unimodular Demand Types (with Satoru Fujishige)

Abstract

We propose a new and general dynamic design for efficiently auctioning multiple heterogeneous indivisible items. The auction applies to all unimodular demand types of Baldwin and Klemperer (2019) which are a necessary and sufficient condition for the existence of competitive equilibrium in economies with indivisible goods and accommodate a variety of substitutes, complements, gross substitutes and complements, strong substitutes, and other kinds. The seller has a reserve price for every bundle of items and maximizes her revenues. The auctioneer announces the current prices for all items, bidders respond by reporting their demands at these prices, and then the auctioneer adjusts the prices of items accordingly. The trading rules are simple, transparent and detail-free. Although bidders are not assumed to be price-takers so they can strategically exercise their market power, this auction always induces bidders to bid truthfully and yields an efficient outcome. Bidding sincerely is an ex post perfect Nash equilibrium. The auction is also privacy-preserving and independent of any probability distribution assumption.

Keywords

Dynamic Auction, Incentive-Compatibility, Competitive Equilibrium, Unimodular Demand Types, Substitute, Complement, Indivisibility, Dynamic Auction Game of Incomplete Information

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