

Predicting Bidders' Willingness to Pay in Online Multiunit Ascending Auctions: Analytical and Empirical Insights

Ravi Bapna, Paulo Goes, Alok Gupta, Gilbert Karuga

We develop a real-time estimation approach to predict bidders' maximum willingness to pay in a multiunit ascending uniform-price and discriminatory-price (Yankee) online auction. Our two-stage approach begins with a bidder classification step, which is followed by an analytical prediction model. The classification model identifies bidders as either adopting a myopic best-response (MBR) bidding strategy or a non-MBR strategy. We then use a generalized bid-inversion function to estimate the willingness to pay for MBR bidders. We empirically validate our two-stage approach using data from two popular online auction sites. Our joint classification-and-prediction approach outperforms two other naïve prediction strategies that draw random valuations between a bidder's current bid and the known market upper bound. Our prediction results indicate that, on average, our estimates are within 2% of bidders' revealed willingness to pay for Yankee and uniform-price multiunit auctions. We discuss how our results can facilitate mechanism-design changes such as dynamic-bid increments and dynamic buy-it-now prices.

*To read the Full paper, please contact Arun_Kumar@isb.edu