Abstract

In this paper, we examine information revelation designs and policies in ad exchanges that use a second-price auction mechanism. Two auction designs are studied: one-call and two-call. Under the one-call design, the ad exchange makes one call to all bidders at the beginning of an auction. Under the two-call design, in addition to the call to all bidders at the beginning of the auction, the exchange calls out the winning bidder at the end of the auction; this second call enables the winning bidder to match the right advertiser for the impression. Thus, the two-call design requires a higher level of technical sophistication but offers to the auction site the choice of the timing and the extent of information released to bidders about an impression.

While valuations are private to bidders, there are two possibilities as far as the information available to the ad exchange on these bidder valuations is concerned: One, the ad exchange has no reliable knowledge about bidder valuations. For this situation, we develop simple information revelation policies that do not use any knowledge of the valuations and establish their performance guarantees. Two, the ad exchange has distributional knowledge about bidder valuations. For this situation, we develop an informed heuristic that exploits this information. While the heuristic continues to offer the same performance guarantee as that of the simple policies, we show that its performance on a comprehensive test bed is near-optimal. The welfare implications of the information revelation policy of the ad exchange on other stakeholders of the ecosystem are also analyzed.

Keywords: Ad exchanges, information revelation designs, heuristic policies