1. Advert Assignment Auctions .....

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Ad-auctions lie at the heart of search markets and generate billions of dollars in revenue for platforms such as Bing and Google. Sponsored search auctions provide a distributed mechanism where advertisers compete for their adverts to be shown to users of the search platform, by bidding on search terms associated with queries.

The earliest search auction required that advertisers bid a separate price to place an advert in each position on the search page. This design was soon abandoned for one where an advertiser simply bid an amount per click: this amount was converted to adjusted bids for each position by multiplication by the platform's estimate of click-through probabilities; the highest adjusted bid won the first position, the second-highest the second position, and so on, with payments only made when an advert was clicked. Since then the design used to assign adverts to positions on the page and the rules used to determine payments have changed several times, with platforms such as BingAds or Google AdWords using variants of the generalised second-price auction to determine the price per click.

This essay should survey the recent research literature on the modelling of Ad-auctions, paying particular attention to the incentive issues for advertisers and the platform, and to the different information about search queries available to advertisers and the platform.

Relevant Courses

Useful: Stochastic Networks, Mathematics of Operational Research.

References

[1] P. Milgrom (2010) Simplified mechanisms with an application to sponsored-search auctions. *Games and Economic Behavior* 70, 62-70.

[2] B. Roberts, D. Gunawardena, I. A. Kash, P. Key (2013) Ranking and tradeoffs in sponsored search auctions. In *EC '13 Proceedings of the fourteenth ACM conference on Electronic Commerce*, 751–766.

[3] F. Kelly, P. Key and N. Walton (2015) Efficient advert assignment.

http://arxiv.org/abs/1404.2750