

## Search Direction with Régis Renault:

The project brings together two themes that are central to Internet commerce – consumer sequential search and position auctions.

Much search is sequential, and much is ordered too. The key puzzle to reconcile is to have firms want to bid more to be earlier – so profits must be greater at earlier slots – but consumers want to follow the sequence suggested to them by the ad order, so they must expect lower prices earlier. We deploy a specific model of sequential search and pricing that is both tractable and can deal with asymmetric advertiser characteristics.

The auction format used for allocating positions to bidders is a generalized second price auction. The highest bidder gets the top slot on the web-page at the second highest bid, etc. Strikingly, under some central conditions, this generates an order of firms that yields the maximal total advertiser gross surplus.

We study the efficiency of the market outcome. For each optimization criterion (gross advertiser profit, social surplus, consumer surplus), we can rank firms by summary statistics (“scores”). Then the rankings are compared. Results indicate the market bias. Allowing for a consumer participation margin rationalizes the use of relevancy scores in Google’s auctions, though it remains to show to what extent this improves the allocation.