

Revenue-Maximizing Online Auctions

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Motivation

- Hajiaghayi *et al.* 2005 demonstrated the fallibility of greedy allocation in the online auction problem with respect to revenue.
- How does their randomized algorithm compare to greedy allocation without a reserve price? With an optimal reserve price? What about priors?

Implementation

- k identical goods expiring at times $\{1, \dots, k\}$
- n bidders with values $\in [0, 1]$ according to a Beta distribution with random expectation, random arrival and departure times, and quasi-linear utilities.
- Prior information scales between perfect and uniform.
- 10 rounds per auction in this implementation

Results

- The optimal reserve price for this auction is given by: $r^* = \frac{1 - F(r^*)}{f(r^*)}$ (Myerson 1981)

$n=10$	0	.4	1
Optimal	.963	1.447	1.361
No-Reserve	1.464	1.652	1.338
Hajiaghayi et al.	.883	.887	.845
$n=1000$	0	.4	1
Optimal	1.471	1.406	1.265
No-Reserve	1.901	1.633	1.254
Hajiaghayi et al.	.882	1.084	.834