The Effect of Size and Information on the Unique-Bid Auction



A study of how auction size and access to information affects the performance of a unique-bid auction.

The Technology Project

- To create an auction environment and allow human and robotic bidders to compete for a fictitious auction item.
 - Complex system modeling
 - Computer networking
 - Artificial Intelligence
 - Graphical interfaces and displays

The Unique-Bid Auction

Seller's Perspective:

- Seller sets a bidding range below value of item
- Seller determines a set number of bidders
- Bidders pay a bidding fee to the seller and submit their bids
- Winning bidder pays his/her bid and receives the item

Example:

- \$60,000 Cadillac for a maximum bid of \$120
- 6 000 bidders
- \$10 fee (\$60,000 to the auctioneer)
- Winning bidder gets a Cadillac for at most \$130
- Losing bidders lose \$10
- Seller gets at most \$120 profit

The Unique-Bid Auction

Bidders' Perspective:

- Bidders submit bid within the bidding range
- Item goes to the bidder
- who picks the highest value that no other bidder chooses.
- In event of tie, item goes to first bidder who picks correctly

Example:

 In Cadillac auction, bidding distribution is:

120, 120, 120,

- 119, 119, 119, 119,
- 118, 118,
- 117,
- 116,

. . .

115, 115,

Highest unique bid is 117

Robotic Bidders

- Robotic bidding strategy involves picking randomly from a probability distribution
- When bid does not win, the chance of bidding that value decreases
- For each round, the chance of bidding the winning value value increases

Bidder Program

- Distribution Histogram
- Bid inputs
- Auto-Strategies
 - Random(percentile)
 - Previous Winners
 - Top Choices



Red selection is the winning bid

The Economics Project

• To manipulate the auction environment to test the responses in the auction results.

Questions

When deciding on a value to bid, players need to evaluate the behavior of opponents.

 How does the size of the auction affect the behavior of the auction? As the rounds progress, players are forced to reevaluate their bidding strategies.

 How does access to the previous round's information affect the behavior of the auction?