

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,

...

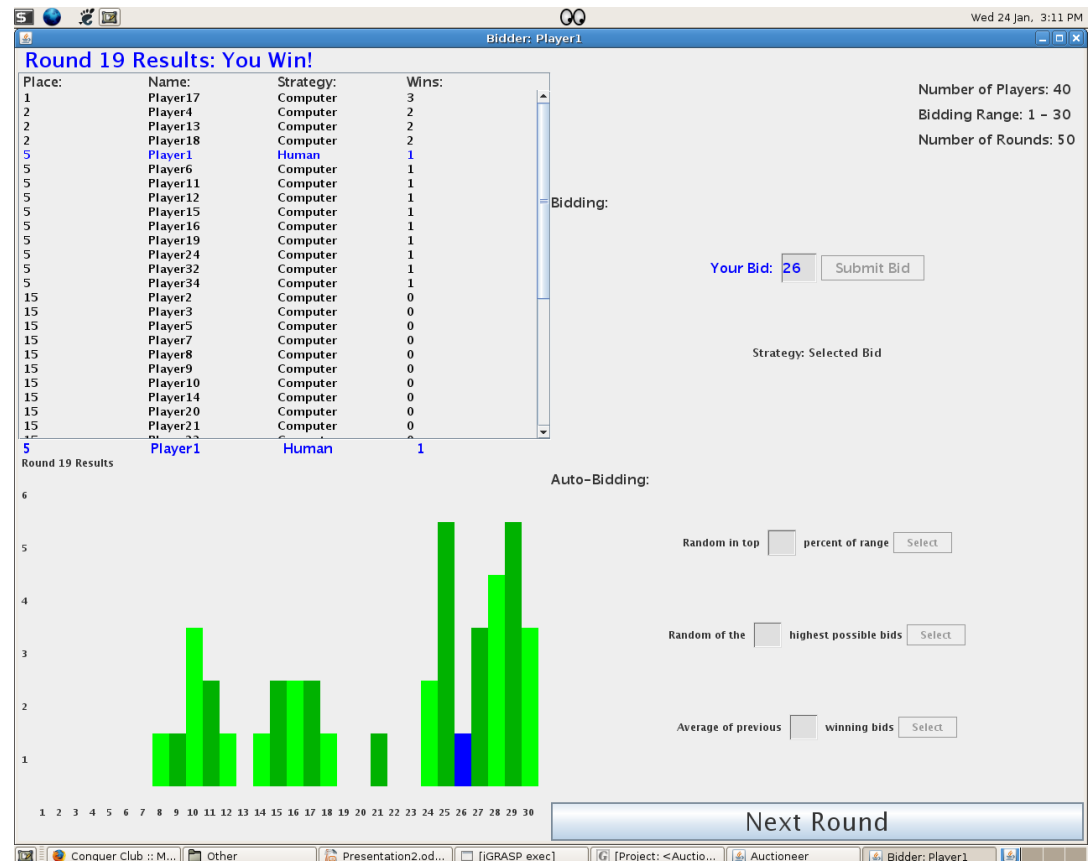
Highest unique bid is 117

Robotic Bidders

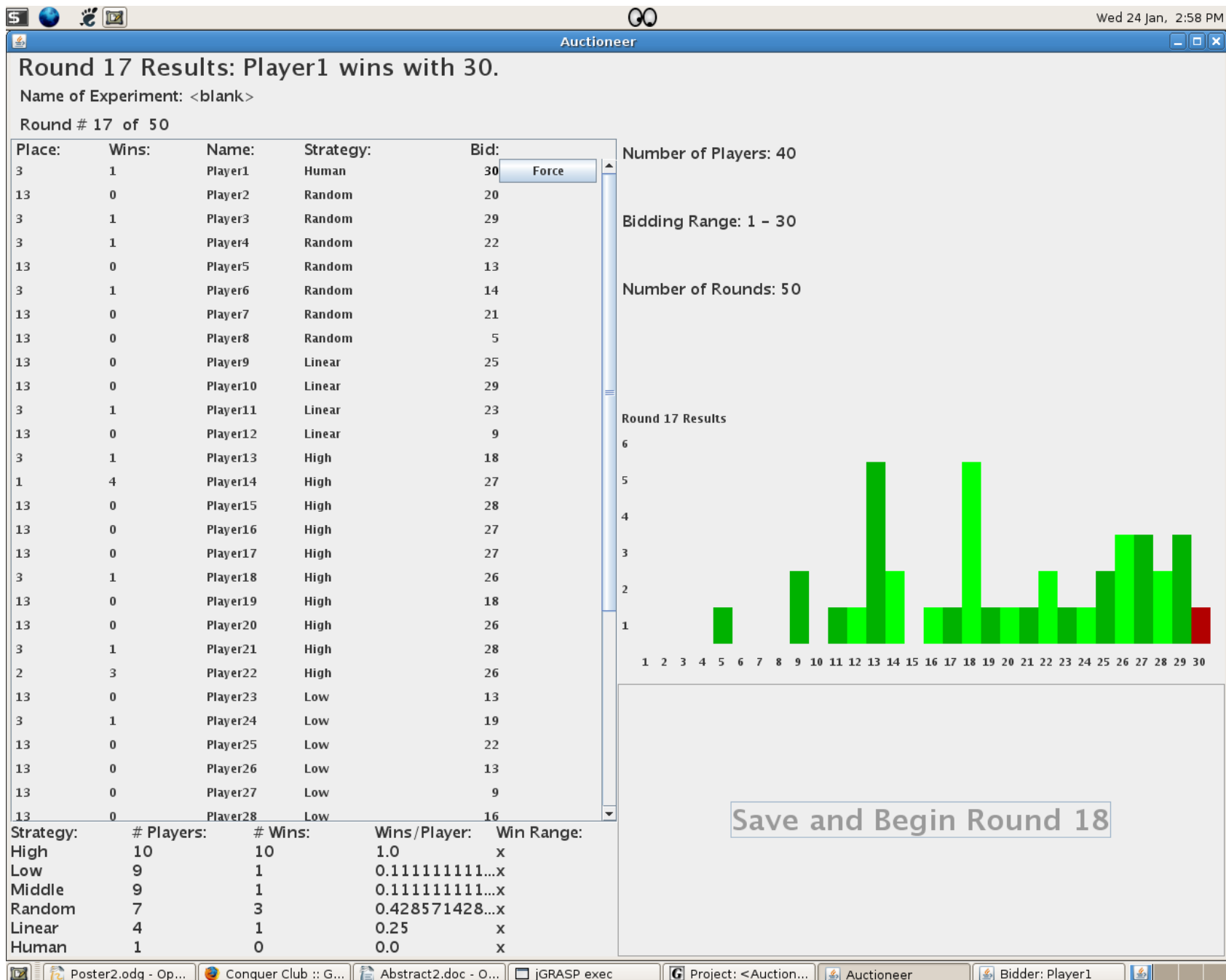
- Robotic bidding strategy involves picking randomly from a probability distribution
- When bid does not win, the chance of bidding that value decreases
- For each round, the chance of bidding the winning value value increases

Bidder Program

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



Auctioneer Program



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?