

Lecture 2b: Auctions

SIF8072
**Distributed Artificial Intelligence
and
Intelligent Agents**

<http://www.idi.ntnu.no/~agent/>

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References

Wooldridge: "Introduction to MAS"

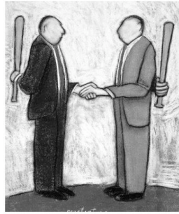
– Auctions: Chapter 7

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Negotiation

- "The process of several agents searching for an agreement"
e.g. about price.

➤ *Reaching consensus*



"Rules of Encounter" by
Rosenchein and Zlotkin, 1994

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Auction: Example 1

Several millions of \$ paid for art
at auction houses such as
Sotheby's.



Ears 2 u, Vincent!

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Auction: Example 2

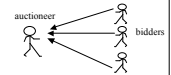
Online Auctions



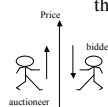
You want to buy some exciting video games.
You see that there are some available on eBay.
You register at eBay and offer a bid for some of
these games.

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Auctions



- An Auction takes place between an auctioneer and a collection of bidders.
- Goal is for the auctioneer to allocate the goods to one of the bidders.
- In most settings, the auctioneer desires to maximise the price; bidders desire to minimise the price.



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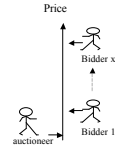
Auction Parameters

Value of goods	Private, public/common, Correlated
Winner determination	First price, second price
Bids may be	Open cry, Sealed
Bidding may be	One shot, ascending, descending

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English Auctions

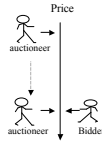
- English auctions are:
 - First price
 - Open cry
 - Ascending
- Dominant strategy: successively bid a small amount more than the highest current bid until it reaches the valuation, then withdraw.
- Susceptible to Winners curse
 - Winner is the one who overvalues the goods on offer and may end up paying more than its worth.



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Dutch Auctions

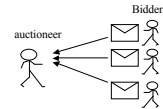
- Dutch auctions are:
 - Open cry
 - Descending
- Auctioneer starts at an artificially high price. Then continually lowers the offer price until an agent makes a bid which is equal to the current offer price.
- Dominant strategy: None
- Susceptible to Winners curse
- Often used with multiple lots



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First-price Sealed-bid Auctions

- One shot auction
- Single round, where bidders submit a sealed-bid for the good.
- Good is awarded to agent that made the highest bid.
- Winner pays price of highest bid.
- Best strategy: bid less than true value.



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Vickrey Auctions

- Vickrey auctions are:
 - second-price
 - sealed-bids
- Good is awarded to agent that made the highest bid.
- Winner pays price of second highest bid.
- Best strategy: bid your true value.
- Susceptible to anti-social behaviour

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Lies and Collusions

- Lies:
 - By the bidders (e.g. In Vickrey auctions)
 - By the auctioneer (shills, in Vickrey auction)
- Collusion of bidders
 - Coalition of bidders where they agree beforehand to put forward artificially low bids for the good on offer. When the good is obtained, the bidders can then get the true value of the good and share the profits.

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Limitations of Auctions

- Only concerned with the allocation of goods;
 - Not adequate for settling agreements that concerns matters of mutual interest.
- Negotiation

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Let's take a minute.....

- Can you think of any auctions that you have come across?
- How about offering your notebook to the highest bidder at the end of the year.....
- Discuss with your neighbour.

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.....Selecting a Bid



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Auctions: Summary

- An Auction takes place between an auctioneer and a collection of bidders.
- In most settings, the auctioneer desires to maximise the price; bidders desire to minimise the price.
- Types of Auctions:
 - English auction
 - Dutch auction
 - First-price sealed bids
 - Vickrey (Second-price sealed bids)
- Useful for allocating goods. But too simple for many other settings.

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Next Lecture: Negotiation

Will be based on:

”Reaching Agreements”,

Chapter 7 in

Wooldridge: ”Introduction to MultiAgent Systems”

Coordination – Working together, Chapter 9

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