

CS344M

Autonomous Multiagent Systems

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Good Afternoon, Colleagues

Are there any questions?

Logistics

- Progress reports due at beginning of class
 - 2 hard copies
 - Attach your proposals
 - Anonymized soft copy

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- Prof. Stone will teach class Thursday

Distributed Rational Decision Making

Self-interested, rational agent

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The protocol is key

Evaluation Criteria

- Social welfare
- Pareto efficiency
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- Efficiency (computational, communication)

Voting vs. auctions

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 - result affects all

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 - result affects all
- Auctions: maximize profit
 - result affects buyer and seller

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- Write down your bid
- Repeat with 2nd price sealed-bid auction
- Number under the line is your utility

Auctions

- Valuations:

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 - second-price sealed-bid (Vickrey)

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Revenue equivalence: private-value, risk-neutral

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- What if it's an antique?

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 - Why? Winner's curse

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- Application of auctions to robot soccer?

Auctions vs. voting

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Gibbard-Satterthwaite

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What about Clarke tax algorithm?

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- Push-over: Rank someone higher to get someone else elected
 - e.g. in a protocol with multiple rounds

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Criterion of independence of irrelevant alternatives. If one set of preference ballots would lead to an overall ranking of alternative X above alternative Y and if some preference ballots are changed without changing the relative rank of X and Y , then the method should still rank X above Y .

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Not all possible!

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- Strategy proof under weaker irrelevant alternatives criterion
- A pairwise method
- Smith set: smallest set of candidates such that each candidate in the set preferred over each candidate not in the set
- Every candidate in the Smith set is relevant

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- Does that solve everything? What about cycles?