### Algorithmic game theory

Martin Balko

### 13th lecture

January 6th 2022



 For revenue maximization, we had to consider Bayesian model, where each bidder i draws his valuation according to some probability distribution F<sub>i</sub>.

• For revenue maximization, we had to consider Bayesian model, where each bidder *i* draws his valuation according to some probability distribution *F<sub>i</sub>*. We then try to maximize the expected revenue.

- For revenue maximization, we had to consider Bayesian model, where each bidder i draws his valuation according to some probability distribution  $F_i$ . We then try to maximize the expected revenue.
- In DSIC mechanisms, maximizing the expected revenue is then the same as maximizing the expected virtual social surplus  $\sum_{i=1}^{n} \varphi_i(v_i) x_i(v).$  (Theorem 3.14).

- For revenue maximization, we had to consider Bayesian model, where each bidder i draws his valuation according to some probability distribution  $F_i$ . We then try to maximize the expected revenue.
- In DSIC mechanisms, maximizing the expected revenue is then the same as maximizing the expected virtual social surplus  $\sum_{i=1}^{n} \varphi_i(v_i) x_i(v).$  (Theorem 3.14).
- If  $F_1 = \cdots = F_n = F$  is regular, then Vickrey's auction with reserve  $\varphi^{-1}(0)$  maximizes the expected revenue among all single-item auctions.

• Bulow-Klemperer theorem,

- Bulow-Klemperer theorem,
- Revelation principle,

- Bulow-Klemperer theorem,
- Revelation principle,
- Multiparameter environments.

#### • Exam format:

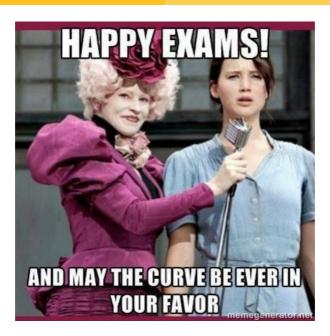
- o Oral exam with preparation, 4 hours at max.
- I will ask about two topics, one survey question and one with proofs.

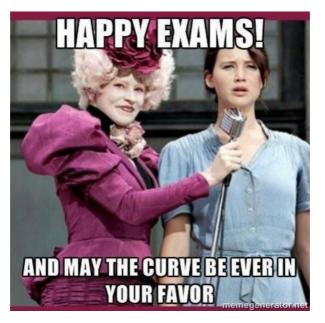
- Exam format:
  - o Oral exam with preparation, 4 hours at max.
  - I will ask about two topics, one survey question and one with proofs.
- Dates (so far):
  - 11.1. 10:00–14:00, capacity 9
  - 25.1. 10:00–14:00, capacity 9

#### Exam format:

- o Oral exam with preparation, 4 hours at max.
- I will ask about two topics, one survey question and one with proofs.
- Dates (so far):
  - 11.1. 10:00-14:00, capacity 9
  - 25.1. 10:00–14:00, capacity 9
  - o If you wish to try the exam at some other date, let me know.

- Exam format:
  - o Oral exam with preparation, 4 hours at max.
  - I will ask about two topics, one survey question and one with proofs.
- Dates (so far):
  - 11.1. 10:00-14:00, capacity 9
  - 25.1. 10:00–14:00, capacity 9
  - o If you wish to try the exam at some other date, let me know.
- What you should know: everything that we covered (everything is included in the lecture notes).





Thank you for your attention.