

Algorithmic game theory

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10th lecture

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Myerson's lemma

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- We then generalized single-item auctions to **single-parameter environments**.
- Is there an awesome auction for single-parameter environments?

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Figure: Roger Myerson (born 1951) receiving a Nobel prize in economics.

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Theorem (Myerson's lemma)

In a single-parameter environment, the following three claims hold.

- (a) An allocation rule is implementable if and only if it is monotone.
- (b) If an allocation rule x is monotone, then there exists a unique payment rule p such that the mechanism (x, p) is DSIC (assuming that $b_i = 0$ implies $p_i(b) = 0$).
- (c) For every $i \in \{1, \dots, n\}$, the payment rule p is given by

$$p_i(b_i; b_{-i}) = \int_0^{b_i} z \cdot \frac{d}{dz} x_i(z; b_{-i}) dz.$$



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ONE US DOLLAR BILL- WHAT'S IT WORTH?

Item condition: --

Time left: 2h 6m 28s (Jun 06, 2010 19:20:07 PDT)

Bid history: 0 bids

Starting bid: US \$0.99

Your max bid: US \$ Place bid

(Enter US \$0.99 or more)

Watch this item

Shipping: FREE shipping Standard Flat Rate Shipping Service
See all details
Estimated delivery time varies.

Returns: No Returns Accepted

Zoom unavailable Enlarge

ebay Buyer Protection

Seller info
thephotobuddy
(2959 ★) mo
99.9% Positive feedback

Ask a question
Save this seller
See other items

Visit store! The Buddy

Other item info

Item number: 2604

Item location: Orla
Flori
Stat

Ships to: Unit

Payments: Pay
See

Source: <https://goodgearguide.com.au>

- Next lecture, we will focus on **revenue maximization**.

The screenshot shows an eBay auction page for a "ONE US DOLLAR BILL - WHAT'S IT WORTH?". The page includes the eBay logo, navigation links, and a search bar. The item is listed by a seller named "thephotobuddy" with a 99.9% positive feedback rating. The starting bid is US \$0.99, and there are 0 bids currently. The time left for the auction is 2h 6m 28s. The page also features a "FREE shipping" badge and a "Watch this item" button. The seller's information and other item listings are visible on the right side of the page.

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Thank you for your attention.