CS395T
Agent-Based Electronic Commerce
Fall 2006

Peter Stone

Department of Computer Sciences
The University of Texas at Austin

A Bidding Game

- Bid for my pen

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- The highest bid wins

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First-price sealed bid auction

Let's Try Again

- Same thing

- New values

Now Change the Rules

- The highest bidder still wins

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- But only pay as much as the 2nd highest bidder

Now Change the Rules

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Second-price sealed bid auction

This Course

- Auctions, including some auction theory

- Game theory and mechanism design

- Autonomous bidding agents

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- Other topics according to your interests

  - What do you want to learn?

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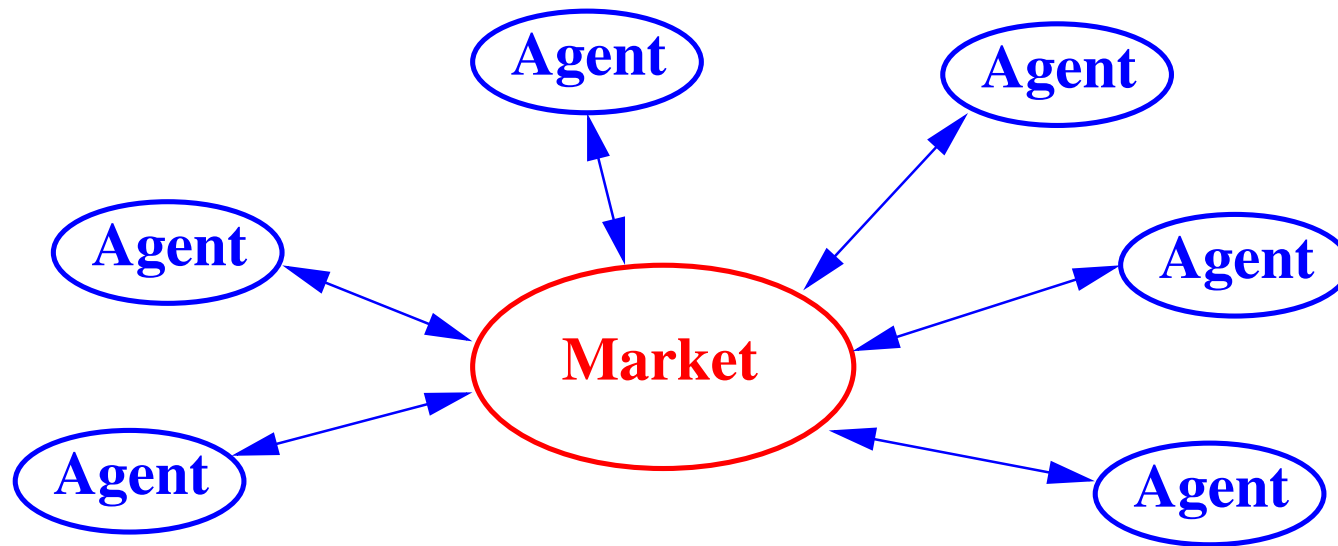 - What do you want to learn?

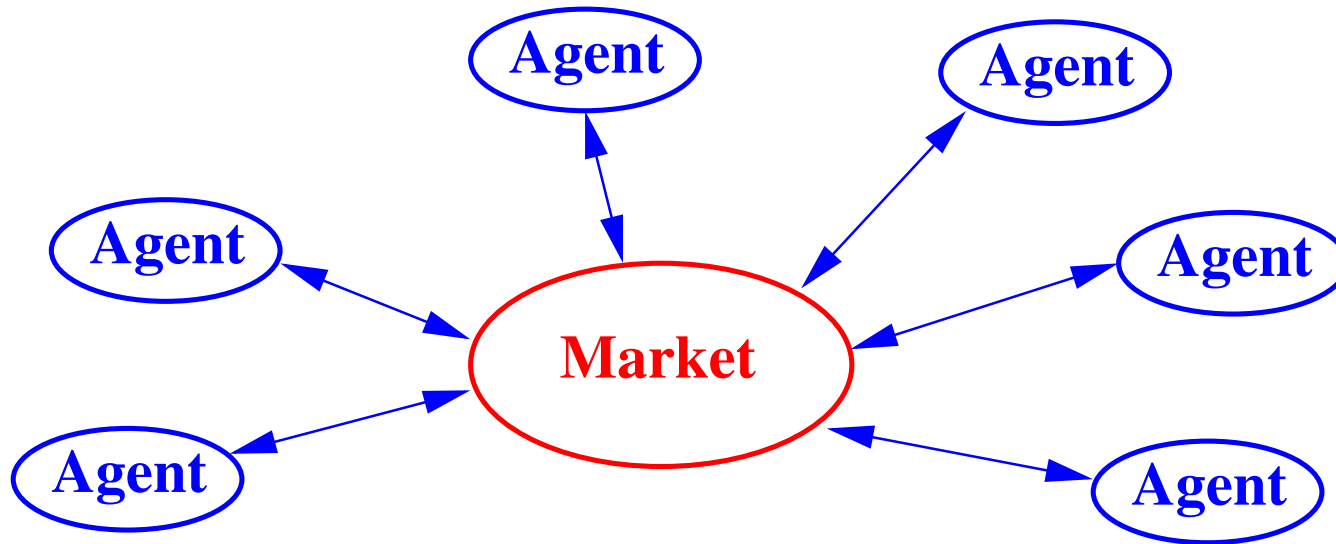Syllabus on-line

Market Mechanisms
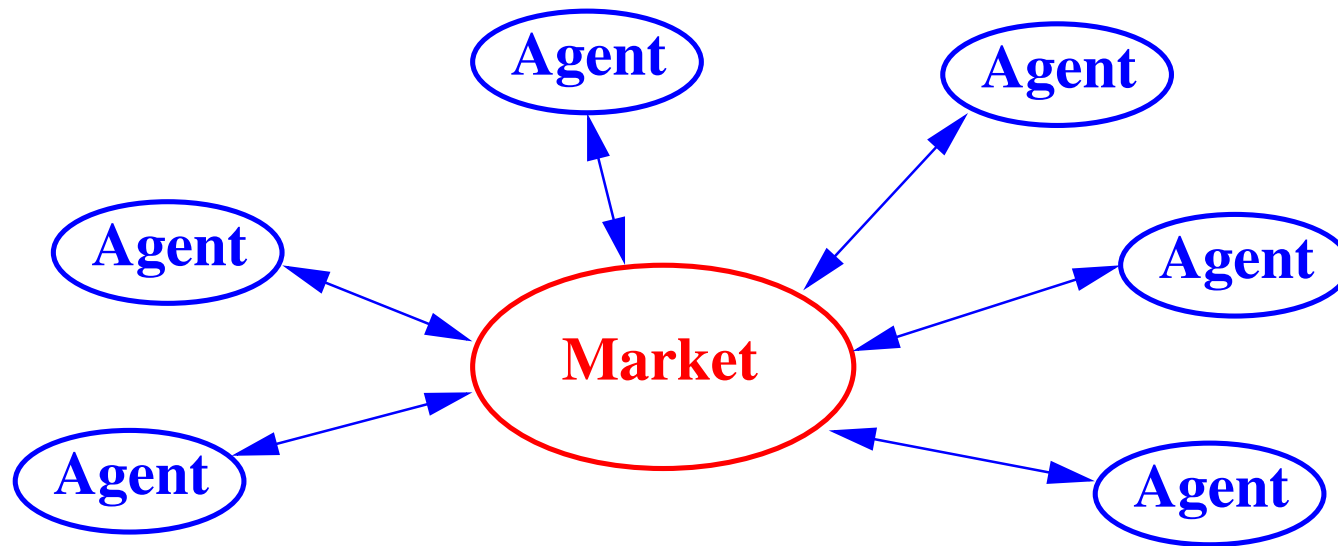
Market Mechanisms

- eBay

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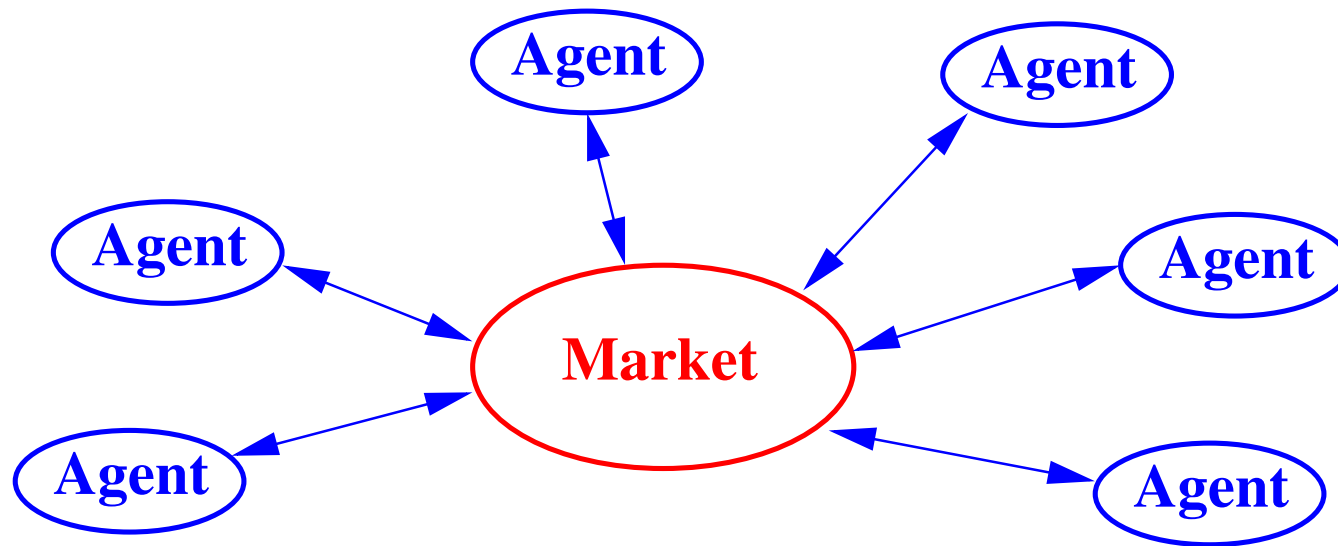
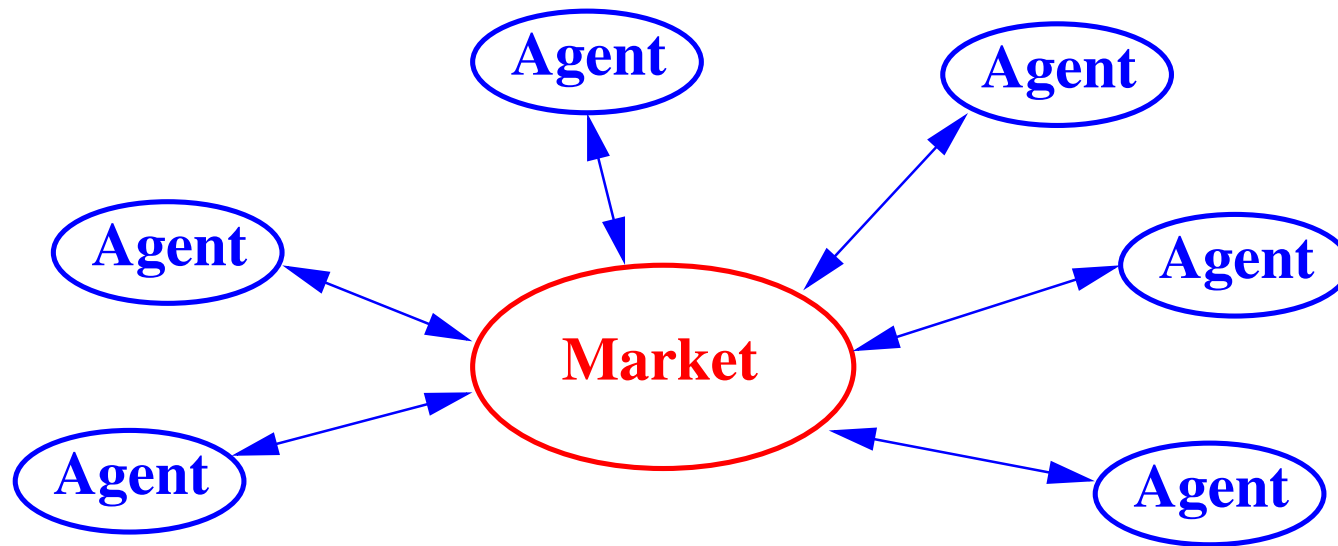

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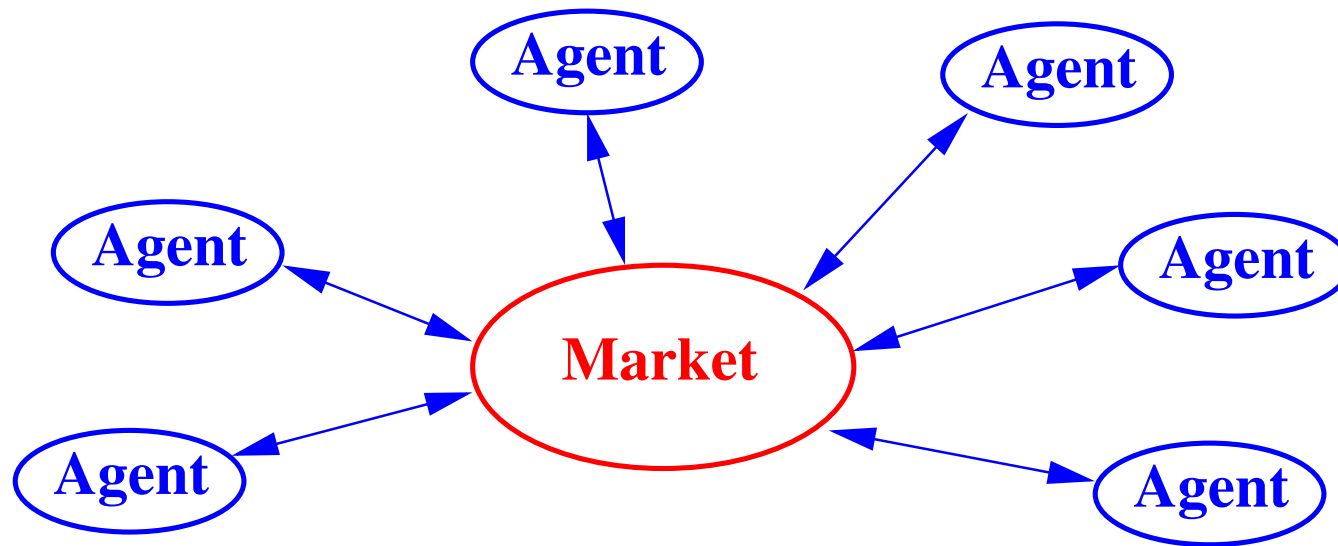
- eBay
- Telecommunications spectrum
- Electricity
- Takeoff/landing slots at airports
- Building temperature

Some Bidding Agent Domains

- Simulated travel agent

- Supply chain management

- Automated market design

- FCC spectrum auctions

- Stock market trading

Simulated Travel Agent

Trading Agent Competition

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- Bid for flights, hotel rooms, entertainment tix

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- Values of goods interact

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Simulated Travel Agent

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Trading Agent Competition

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- Represent customers with different preferences

Simulated Travel Agent

Trading Agent Competition

- Bid for flights, hotel rooms, entertainment tix

- Simultaneous auctions of different types

- Values of goods interact

- Represent customers with different preferences

- Bid against other travel agents, created by others
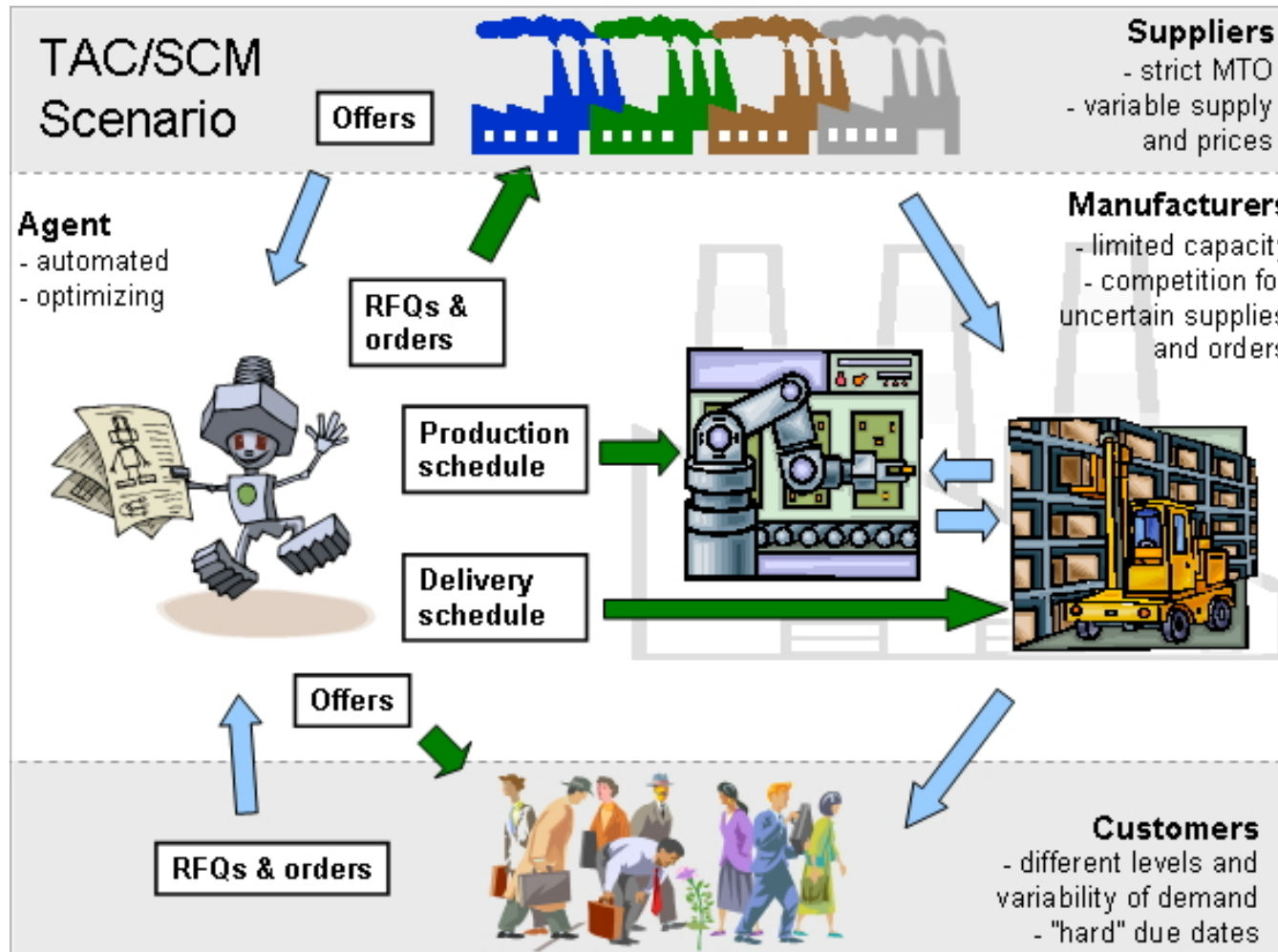
Supply Chain Management

Trading Agent Competition (TAC)

Automated Market Design

- A new TAC game
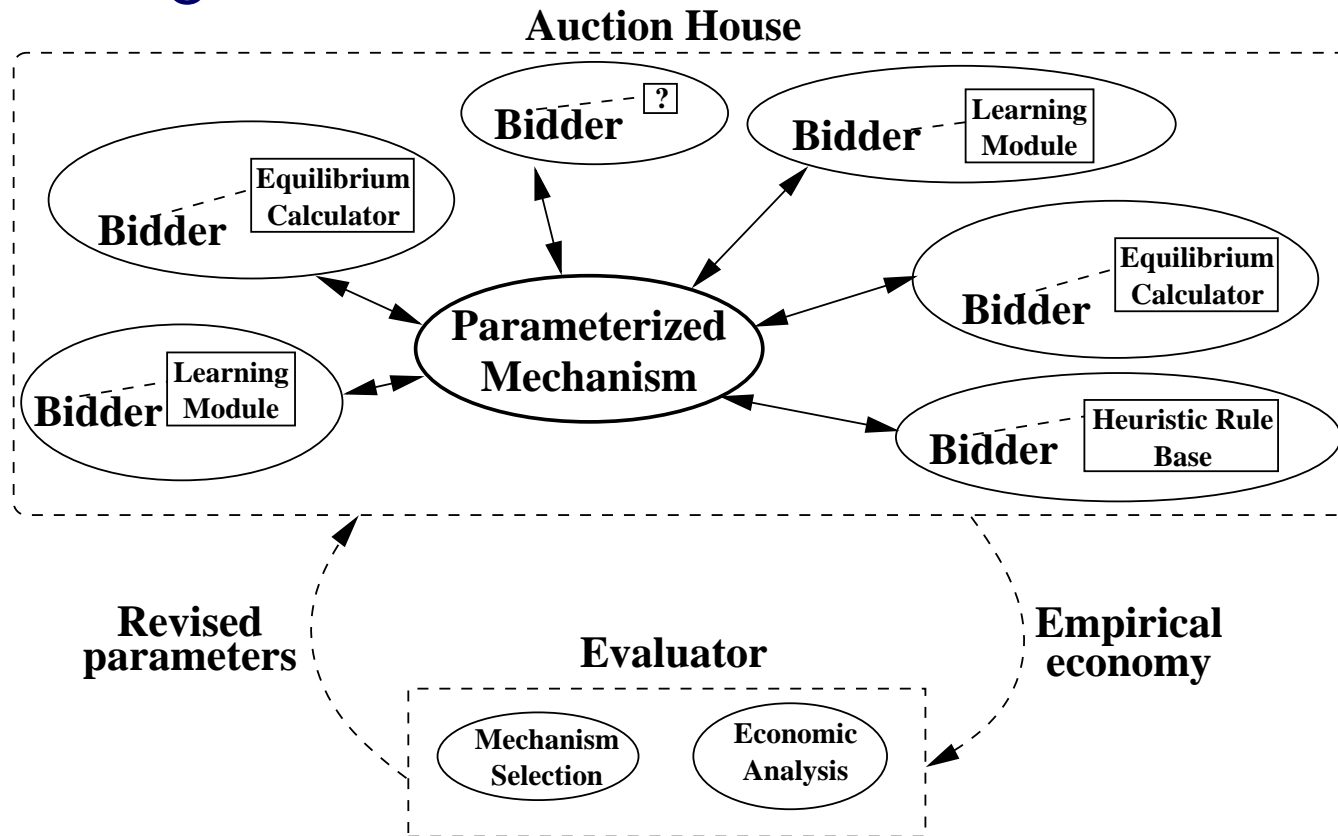
- First competition next summer

- May get a preview this semester

FCC Spectrum Auctions

- Model of auction #35

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- 422 licenses; 80+ bidders; $\approx$ \$8 billion spent

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- FauCS — a realistic simulator based on information from AT&T's real bidders

Stock Market Trading

Penn-Lehman Automated Trading Project

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- Real market data

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Penn-Lehman Automated Trading Project

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- Based on Electronic Crossing Network (ECN) data

- Not just stock price, but complete order books

Stock Market Trading

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Penn-Lehman Automated Trading Project

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- Not just stock price, but complete order books

- Agent bids can be matched with real-world orders

Bidding for Multiple Items

	utility
camera alone	$50
flash alone	10
both	100
neither	0

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  – Auctions are independent (no combinatorial bids)

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- $\in [10, 50]$ — **Depends on the price of the camera**

Research Challenges

- Autonomous bidding — no human input   **(agents)**

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Indifferent to other agents' goals

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Beauty Contest

- Everyone submit a number $\in [0, 100]$

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- http://www.cs.rutgers.edu/~mlittman/topics/nips.html
  - Camerer

- http://www.geocities.com/SiliconValley/Byte/5215/Economics/BeautyContest.html

Assignments for Tuesday

- Join the mailing list!

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- Send a question or comment by midnight Monday