Markets, Algorithms, Incentives, and Networks

WS 2016/2017

Overview Meeting (Vorbesprechung)

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Purpose of today’s meeting

- Let you know more about the **format of the seminar**
- Tell you about the **application process**
- Introduce you to the **topics and material**
Suitability / Requirements

• This is a **bachelor’s level** seminar
• ... that is open for master students as well.
• Suitable for students from
  ‣ Computer science
  ‣ Mathematics
  ‣ Business Administration
  ‣ ...

• Requirements
  ‣ no formal requirements
  ‣ interest in reasoning with mathematical rigor
## Tentative Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Talks</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 30 ✔</td>
<td>14:00 - 15:30</td>
<td>(information)</td>
<td>01.10.011</td>
</tr>
<tr>
<td>October 21</td>
<td>14:15 - 16:00</td>
<td>(kick off)</td>
<td>01.10.033</td>
</tr>
<tr>
<td>December 2</td>
<td>09:00 - 16:30</td>
<td>Presentations</td>
<td>01.10.033</td>
</tr>
<tr>
<td>December 16</td>
<td>09:00 - 16:30</td>
<td>Presentations</td>
<td>01.10.033</td>
</tr>
</tbody>
</table>
Rough Schedule

- Three morning presentations
- Two afternoon presentations
- Presentation:
  - Talk (30 to 45 min)
  - Feedback & Discussions (20-25 min)
  - Break (15 min)
What you have to do in order to pass

- **Attend** all meetings
  - for absence you must have a (very) good reason
- Give a **good talk**
- Write an **abstract** for your talk/topic and pass it around
- Read the abstracts sent to you by your colleagues before the respective talk
  - prepare questions
- Participate in **discussion** sessions
- **Chair** a session
Abstracts

• Instead of handing in reports at the end of the term, we want you to write an abstract of your talk beforehand and give it to your colleagues so that they can prepare

• Length: ~4 pages
  ‣ Introduction or Motivation
  ‣ Definitions and Notation (if necessary!)
  ‣ Present the main ideas you want to convey
  ‣ Give an outlook on your talk (“The talk will primarily deal with…”, “I will give details on…”, etc.)
Do I have to meet my supervisor?

- **Yes**, at least once to discuss what you will cover in your talk and abstract. This should be at least three weeks before your talk.
Feedback and Discussion

• You are welcome to give feedback on the talks
  ‣ immediately after the talk, before the discussion
  ‣ 5-10 minutes

• Discussion about the presented topic
  ‣ technical questions, applications, implications, connections to other issues, etc.
Tasks as a Session Chair

- **Consolidate** and **structure/group** questions
- **Introduce** the speaker and the topic
- **Give** **time signals** to the speaker
- **Moderate** the discussion
  - think of questions to start the discussion (!)
  - make sure that everybody is involved
  - keep an eye on the time
Registration

- Email to saile@in.tum.de
  - name
  - background: program, semester, relevant lectures you had
  - your three most preferred topics (1. ..., 2. ..., 3. ...)
  - a short summary of each of your selected topics (up to ~250 words in total)

- **Deadline:** Sunday (July 03) 23:59 pm!

- Use the matching system to rank the seminar between July 01 and July 06
  - You can check whether you were assigned to this seminar by July 13

- Seminar homepage
Content

• Based on the book *Economics and Computation* by David C. Parkes and Sven Seuken

• “[…] motivated by the consideration of economic incentives within computational systems and by computational considerations in economic systems.”

• 1) Games (Chapters 2, 3, 4)
  2) Auctions (Chapters 6, 7, 8, 11)
  3) Markets (Chapters 10, 12, 22)
  4) Welfare (Chapters 15, 27)
  5) Information (Chapters 17, 30)
  6) Networks (Chapters 23, 25)
Games

- Players have various actions at their disposal
- Every possible outcome is assigned a utility value
- Goal: examine strategic behavior

**Chapters:**
- 2) Simultaneous-Move Games
- 3) Finding an Equilibrium
- 4) Sequential-Move Games
Auctions

• Different flavors, different solutions:
  ‣ Single-item: English Auction, Dutch Auction, First Price, Second Price
  ‣ Combinatorial Auctions

• Issues include the following:
  ‣ Which protocol is better for the auctioneer?
  ‣ Lying, cheating and strategic issues in auctions

• Chapters:
  6) Auction Design
  7) Revenue Optimal Auctions
  8) Mechanism Design
  11) Combinatorial Auctions
Markets

• A market contains different groups of agents (e.g. buyers-sellers, issuers-clients, men-women, students-houses,…)

• Goal: Match agents subject to additional considerations
  ‣ maximize revenue
  ‣ ensure satisfaction/stability
  ‣ maximize trust

• Chapters:
  10) Online Advertising Markets
  12) Matching Markets
  22) Digital Currencies
Welfare

• Agents have preferences over outcomes

• A social choice function is a mapping from everyone’s preferences to a particular outcome
  ‣ Goal: how to pick such functions with desirable properties

• What effects does selfish behavior (instead of cooperation) have on the society’s welfare?

• **Chapters:**
  15) Social Choice and Rank Aggregation
  27) Price of Anarchy
Information

• Designing a reward scheme that incentivises people to provide high quality information
  ▸ assess the accuracy of google translate and measure the quality of the assessment

• Releasing useful information without causing individual harm
  ▸ gain societal value from data, while learning little about an individual

• **Chapters:**
  17) Information Elicitation
  30) Privacy
Networks

• Understand networks from the perspective of economics and computer science

• Analyse structural regularities in real-world networks
  ‣ Small-world property
  ‣ High edge-clustering

• Information propagation over networks

• **Chapters:**
  23) Networks
  25) Games on Networks
See you on October 21!

Seminar homepage: