

Markets, Algorithms, Incentives, and Networks

⊖ WS 2018/2019

Overview Meeting (Vorbereitung)

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Purpose of Today's Meeting

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



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

Date	Time	Talks	Room
June 22 ✓	14:00 - 15:30	(information)	01.10.011

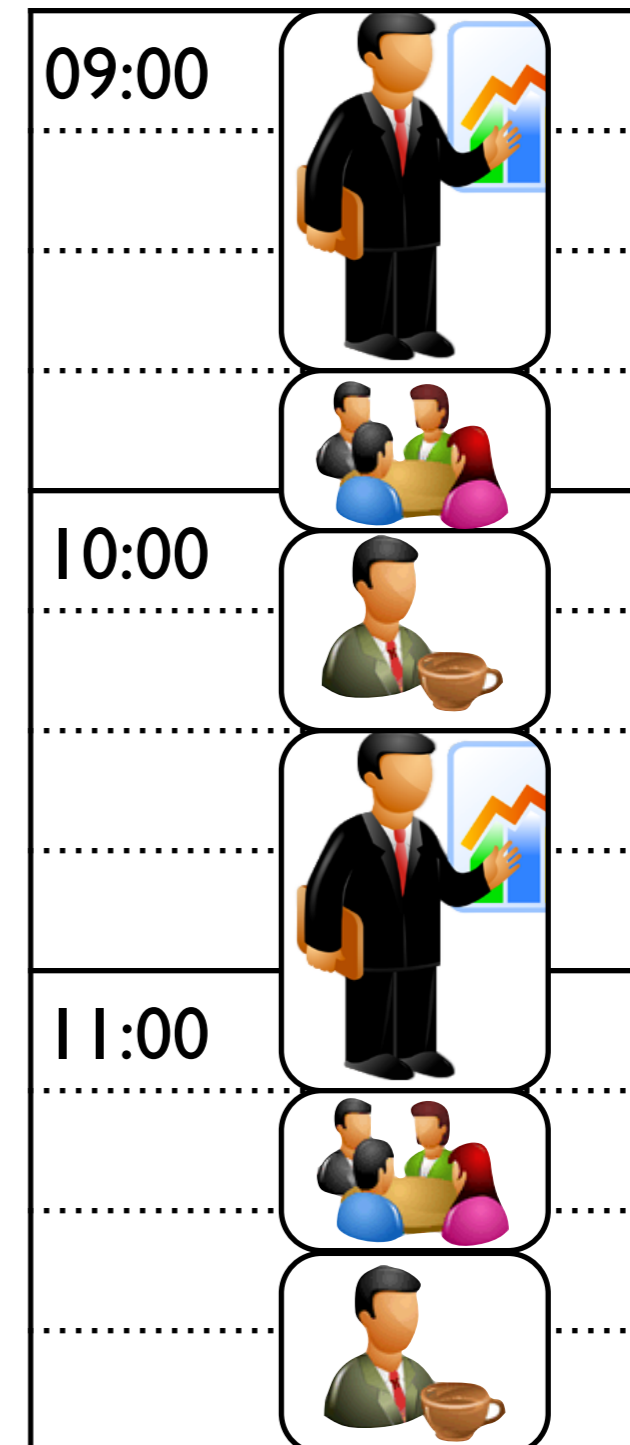
Group 1	Time	Talks	Room
October 23	14:00 - 15:30	(kick off)	01.10.033
November 20	09:00 - 16:30	Presentations	01.10.033
December 11	09:00 - 16:30	Presentations	01.10.033

Group 2	Time	Talks	Room
October 24	14:00 - 15:30	(kick off)	01.10.033
November 21	09:00 - 16:30	Presentations	01.10.033
December 12	09:00 - 16:30	Presentations	01.10.033



Rough Schedule

- Two to three morning presentations
- Two to three afternoon presentations
- Presentation:
 - ▶ Talk (at least 30 up to 45 min)
 - ▶ Feedback & Discussions (20 to 25 min)
 - ▶ Break (15 min)



...



In order to pass you need to ...

- As a regular attendant
 - ▶ attend **all meetings**
 - ▶ read the **abstracts** of your peers
 - ▶ prepare **questions**
 - ▶ participate in **discussions**
- As a speaker
 - ▶ prepare an **abstract** for your talk (~4 pages)
 - ▶ give a **good talk**
- As a session chair
 - ▶ **consolidate** and **structure** questions (if necessary)
 - ▶ **introduce** the speaker
 - ▶ **moderate** the discussion



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.



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, 24, 25)

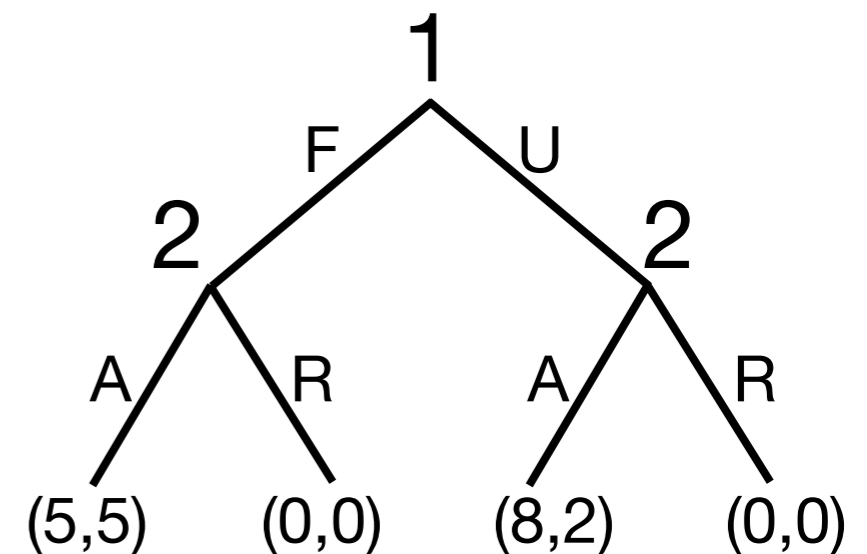


Games

		P ₂	
		C	D
P ₁	C	(3,3)	(1,4)
	D	(4,1)	(2,2)

- 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) Mechanism Design
 - 9) Revenue Optimal Auctions
 - 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**

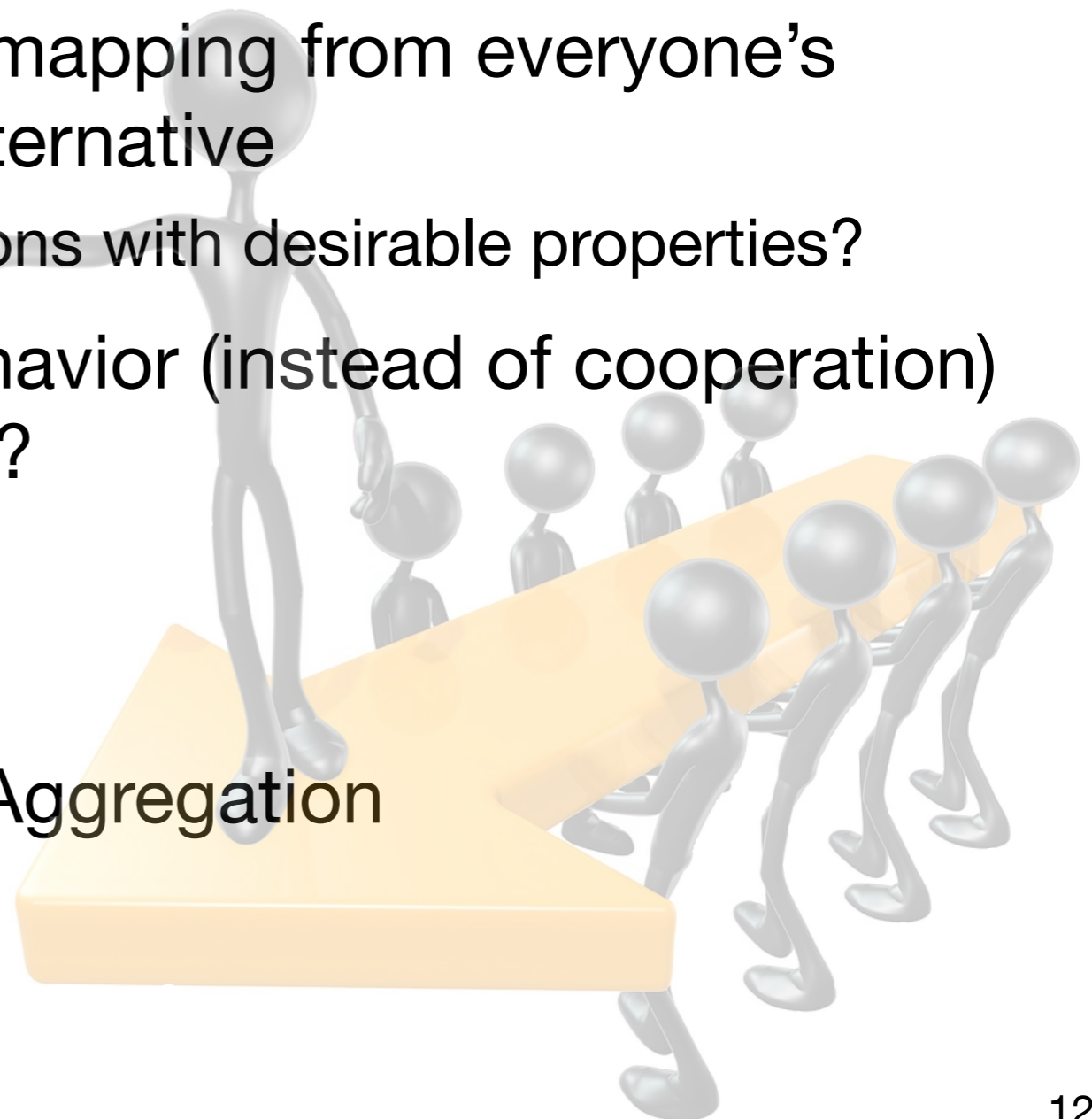
- 10) Online Advertising Markets
- 12) Matching Markets
- 21) Digital Currencies





Welfare

- Agents have preferences over alternatives
- A social choice function is a mapping from everyone's preferences to a particular alternative
 - ▶ Goal: How to pick such functions with desirable properties?
- What effects does selfish behavior (instead of cooperation) have on the society's welfare?
- **Chapters**
 - 14) Social Choice and Rank Aggregation
 - 26) Price of Anarchy





Information

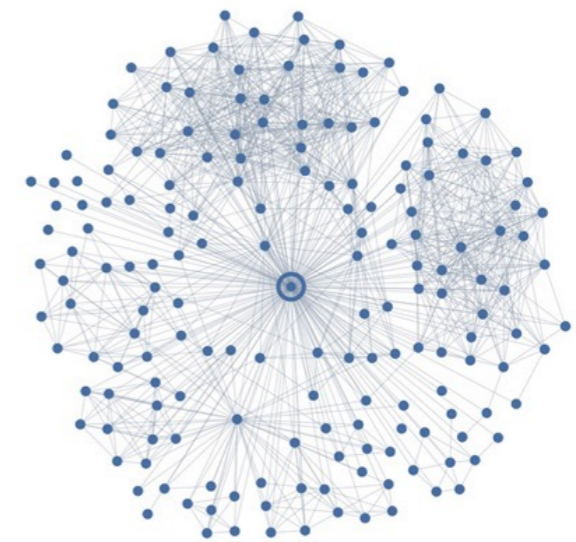
- Designing a reward scheme that incentivizes people to provide high quality information
 - ▶ Assess the accuracy of google translate and measure the quality of the assessment
- Releasing useful information without causing individual harm
 - ▶ Gain societal value from data, while learning little about an individual
- **Chapters**
 - 16) Information Elicitation
 - 29) Privacy





Networks

- Understand networks from the perspective of economics and computer science
- Analyze structural regularities in real-world networks
 - ▶ Small-world property
 - ▶ High edge-clustering
- Information propagation over networks
- **Chapters**
 - 22) Networks
 - 23) Network-Formation Games
 - 24) Games on Networks





Registration

- Email to saile@in.tum.de
 - ▶ name
 - ▶ background: program, semester, relevant lectures you had
 - ▶ your three most preferred topics (chapters) (1. ..., 2. ..., 3. ...)
 - ▶ a short summary of **each** of your selected topics (up to ~200 words in total)
- **Deadline:** Tuesday (June 26) 23:59 pm
- Use the [matching system](#) to rank the seminar between June 29 and July 04
 - ▶ You can check whether you were assigned to this seminar by July 12
- [Seminar homepage](#)



See you in October!