Multiagent Simulations and Applications

Branislav Bošanský and Michal Pěchouček

Artificial Intelligence Center,
Department of Computer Science,
Faculty of Electrical Engineering,
Czech Technical University in Prague

branislav.bosansky@agents.fel.cvut.cz

January 8, 2018

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  - internet of things (a truly open multi-agent system – e.g., a really smart fridge)

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  - resource allocation (e.g., computation time, cpu, mem; different from scheduling – you want the rational agents to participate, the allocation must be fair)

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  - example of nice distributed algorithms

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Typically, all agents have the common goal (revenue, developing products, etc.) and there is no need for interaction of rational agents (there is no need for voting, games, auctions, since they reduce to a direct optimization).

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Please, fill out the **survey** (Did you like the course? Let us know. Didn't you like the course? Help us to improve the course).

Invitations - Algorithmic Game Theory (XEP36AGT)

XEP36AGT	**Algorithmic Game Theory**			Extent of teaching:	2+0+4
Guarantors:	Bošanský B.	Roles:	S	Completion:	ZK
Teachers:	Bošanský B.				
Responsible Department:	13136	Credits:	4	Semester:	

Anotation:

This course extends the knowledge in multiagent systems and game theory by focusing on the algorithmic and computational problems - the computational complexity and current algorithms for finding and approximating different solution concepts, the impact of different representations of games, and the applications of learning techniques in game theory. The course is suitable for students that have already completed the course on Multiagent Systems (A4M36MAS) and either wish to strengthen their knowledge in game theory, or they are working on related problems from artificial intelligence such as machine learning, decision theory, planning.

Course outlines:

1. Introduction to Game Theory
2. Fundamental Theorems (von Neumann, Nash, Kuhn)
3. Succinct Representations of Games
4. Finding Nash Equilibria
5. Approximating Nash Equilibria
6. Finding Correlated Equilibria
7. Finding Stackelberg Equilibria
8. Repeated Games
9. Learning and Dynamics in Games
10. Learning in Extensive-Form Games
11. Games of Incomplete Information, Auctions
12. Algorithmic Mechanism Design
13. Mechanisms Without Money
14. Stochastic Games

The structure of the lecutres covers the important algorithmic topics in game theory. Besides attending the lectures, the students are assumed to work on their homework assignments that strenghten the understanding of the topic (4h per week).