TOPICS IN GAME THEORY

Module 5, 2017–2018
Professor: Andrei Savochkin

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Course information

Course Website: `my.nes.ru`

Instructor's Office Hours: By appointment

Class Time: TBD

Room Number: TBD

TA: Alexander Tonis

Course description

This course will cover several topics that represent a selected subset of modern theories related to games. Most of the course will be based on papers, including some recently published ones, the main contribution of which is to expand the language to describe how an outcome of a game is reached.

The ultimate goal of the course is show that game theory is not dead, and there exist many exciting theories that go well beyond the standard toolset that is taught in the obligatory Game Theory course.

Course requirements, grading, and attendance policies

The prerequisite of this course is a completion of the obligatory Game Theory course at NES.

Student's achievements will be evaluated on the basis of 3–4 problem sets (15% weight) and the final exam (85% weight). The format of the exam is open book. At least 70% lecture attendance and at least 20 point score in the final exam are required for getting a passing grade.

Course contents

This is the general from which we will choose about six topics to study on the basis of available time and mutual interest.

1. Equilibrium refinements

2. Global games

3. Elements of Epistemic Game Theory

4. Theory of knowledge with applications to no-trade theorems

5. Bargaining

6. Learning in games

7. Evolutionary ideas in application to games

8. Elements of Cooperative Game Theory

Sample tasks for course evaluation

(From 2015-2016 final exam.) Suppose that there is a committee of four members that divides the pie of size one. Only the chairperson is allowed to put proposals about how to divide for voting. The decisions are made by the majority voting, and in the case of the split voting (2–2), the new proposal is not accepted (and the previously accepted proposal stands).[1]

1. Formulate this situation as an extended partition structure game.

2. Find the core of this game.

3. Find one von Neumann-Morgenstern stable set for this game (or prove that there is none). Is there such a set that does not coincide with the core? Provide a proof for your answer.

Course materials

Required textbooks and materials

All required material of this course will be presented in class, as no single textbook covers all the topics.

Additional materials

The following books can be used to complement the lectures.

- Andreu Mas-Colell, Michael D. Whinston, and Jerry R. Green, Microeconomic Theory, Oxford University Press, 1995.

- Drew Fudenberg and Jean Tirole, Game Theory, MIT Press, 1991.

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[1]That is, we want to formalize the game in a way so that a state y cannot block x if only two players want to move from x to y.

- Adam Brandenburger (Ed.), The Language of Game Theory: Putting Epistemics into the Mathematics of Games, World Scientific Publishing Company, 2014.

- Drew Fudenberg and David K. Levine, The Theory of Learning in Games (Economic Learning and Social Evolution), MIT Press, 1998.

The list of papers to study will be determined as the course unfolds. As an illustration, in previous years, we studied the following papers.

- Aumann, "Agreeing to Disagree," Ann. Statist., 1976.

- Milgrom and Stokey, "Information, Trade and Common Knowledge," JET, 1982.

- Pearce, "Rational Strategic Behavior and the Problem of Perfection," Econometrica, 1984.

- Brandenburger and Dekel, "Rationalizability and Correlated Equilibria," Econometrica, 1987.

- Brandenburger, Friedenberg, and Keisler, "Admissibility in Games," Econometrica, 2008.

- Brandenburger, "The power of paradox: some recent developments in interactive epistemology," Int J Game Theory, 2007.

- Aumann and Brandenburger, "Epistemic Conditions for Nash Equilibrium," Econometrica, 1995.

- Battigalli and Siniscalchi, "Strong Belief and Forward Induction Reasoning," JET, 2002.

- Cho and Kreps, "Signaling Games and Stable Equilibria," QJE, 1987.

- Cho and Sobel, "Strategic Stability and Uniqueness in Signaling Games," JET, 1990.

- Rubinstein, "Perfect Equilibrium in a Bargaining Model," Econometrica, 1982.

- Abreu and Gul, "Bargaining and Reputation," Econometrica, 2000.

- Abreu and Pearce, "Bargaining, Reputation, and Equilibrium Selection in Repeated Games with Contracts," Econometrica, 2007.

Academic integrity policy

Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.