EPICENTER Summer Course on Epistemic Game Theory

Incomplete Information, Unawareness and Psychological Games

Welcome

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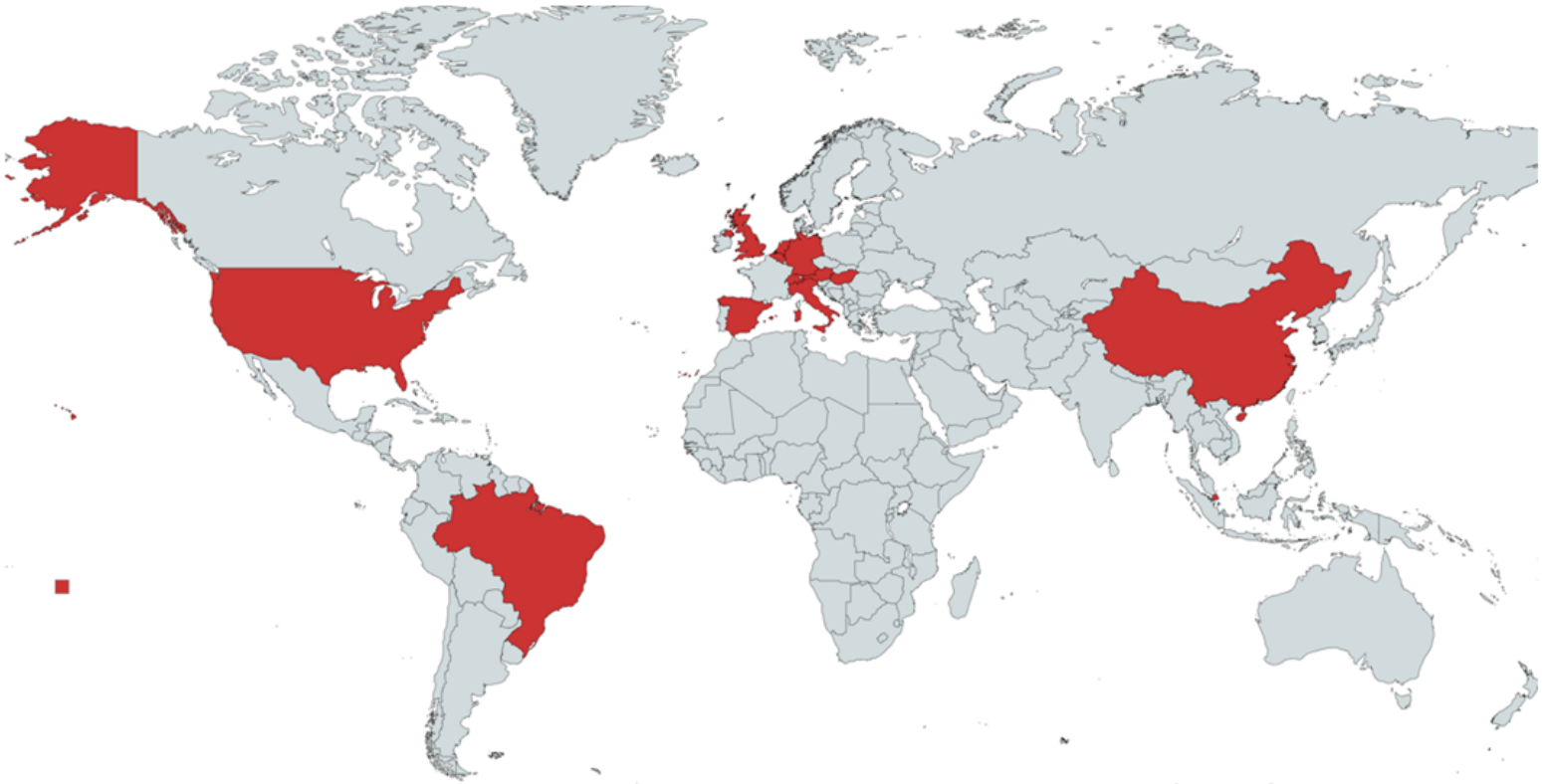
Participants

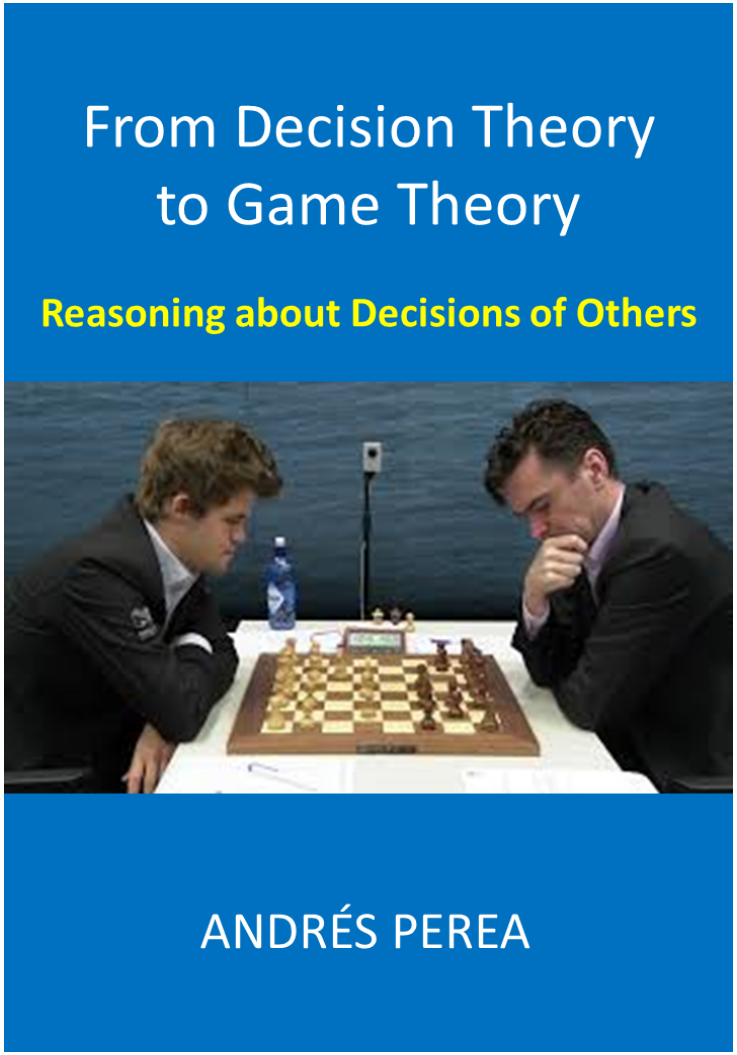


30 participants, 13 countries, 9 disciplines

15 PhD students, 9 master students,
3 research master students, 3 assistant professors

Structure of the Course

Book



Structure of the Course

Content

- In this course we explore:
- games with incomplete information:

  you are uncertain about the opponents' preferences
- games with unawareness:

  opponents are unaware of some of the choices you can make
- psychological games:

  your preferences depend on what you think that your opponent believes about you
- Restrict to static games.

Structure of the Course

Methodology

- Unified decision-theoretic approach:

  every game is viewed as a collection of one-person decision problems

- Unified reasoning approach:

  for every class of games we focus on the same three reasoning concepts:

- common belief in rationality

- simple belief hierarchy:

  you believe that your opponents are correct about your beliefs

- symmetric belief hierarchy:

  there is a symmetry between your beliefs and what you think that others believe

Structure of the Course

Methodology

- For every reasoning concept we ask:
- What it is the intuitive idea?
- How can it be defined formally?
- How can we characterize the choices you can rationally make if you reason according to this concept?
- How does it compare to the other reasoning concepts?

Structure of the Course

Overview of the Concepts

	common belief in rationality	common belief in rationality with simple belief hierarchy	common belief in rationality with symmetric belief hierarchy
standard game	iterated elimination of strictly dominated choices	Nash equilibrium	correlated equilibrium
incomplete information	generalized iterated strict dominance	generalized Nash equilibrium	Bayesian equilibrium
unawareness	iterated strict dominance for unawareness		
psychological game	iterated elimination of choices and second-order expectations	psychological Nash equilibrium	psychological correlated equilibrium

Structure of the Course

Outline

Day	Exercises	Theory
Day 1		**Decision problems** Andrés Perea
Day 2	**Decision problems** Joep van Sloun	**Common belief in rationality in standard games** Andrés Perea
Day 3	**Common belief in rationality in standard games** Joep van Sloun	**Correct and symmetric beliefs in standard games** Andrés Perea
Day 4	**Correct and symmetric beliefs in standard games** Joep van Sloun	**Common belief in rationality with incomplete information** Christian Bach
Day 5	**Common belief in rationality with incomplete information** Joep van Sloun	**Correct and symmetric beliefs with incomplete information** Christian Bach

Structure of the Course

Outline

Day	Exercises	Theory
Day 6	**Correct and symmetric beliefs with incomplete information** Rubén Becerril	**Common belief in rationality with unawareness** Stephan Jagau
Day 7	**Common belief in rationality with unawareness** Rubén Becerril	**Common belief in rationality in psychological games** Stephan Jagau
Day 8	**Common belief in rationality in psychological games** Rubén Becerril	**Correct and symmetric beliefs in psychological games** Niels Mourmans
Day 9	**Correct and symmetric beliefs in psychological games** Niels Mourmans	**Discussion of practice exam** Niels Mourmans and Joep van Sloun
Day 10	**Exam**	

Structure of the Course

- Prepare exercises before coming to the exercise session
- Which exercises?
- Lecture slides
- In-chapter questions in the book
- Exam: need at least 5.5 out of 10
- Attendance requirement: 20 out of 24 sessions
- Two kinds of certificate
- Saturday: City walk and lunch
- Enjoy the course!