

Logic, Agency, and Games

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Abstract Logic has had two complementary aspects in its history, one more static, one more dynamic (these are not judgmental terms). Logic is a theory of what follows from what in the grooves of reality – but it also offers an account of rational intellectual activities such as inference, decision, or engaging in debate. This course explores the latter perspective with a special focus on games. Games are a microcosm of every major notion studied in philosophical and computational logic, and their uses extend into all areas represented at NASSLLI.

Day 1

A brief précis of current dynamic-epistemic- logics, showing what features of fallible information- and preference-driven agents fit well into the realm of logic.

Day 2

Uses of logic to study different levels for analyzing games and their strategic structure, including dynamic-epistemic scenarios that turn game theory into a 'theory of play'.

Day 3

Influences from computer science in all this: the story of logic and agency is at the same time one of the foundations of modern computation.

Day 4

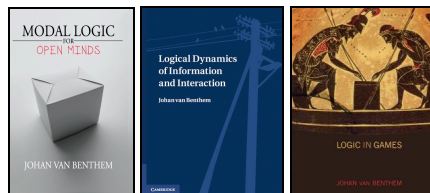
Reversing direction: current uses of games to analyze basic notions of logic (evaluation for truth, structural invariance), and discuss what this means.

Day 5

Recent developments show how the earlier perspectives interact in a study of social interaction over time, where groups and social networks are major players. I identify some challenges, such as linking up between logic, probability, and dynamical systems.

References

J. van Benthem, 2010, *Modal Logic for Open Minds*, CSLI Publications, Stanford, –, 2011, *Logical Dynamics of Information and Interaction*, Cambridge University Press, Cambridge UK. –, 2014, *Logic in Games*, The MIT Press, Cambridge MA.



Of course, a lot other people are involved in the topics of these introductory lectures!

Reading material and more detailed course description:

<http://staff.fnwi.uva.nl/j.vanbenthem/LogicAgency.zip>

You can also email me during the course at johan@stanford.edu